IMPROVING MARINE AIR INTELLIGENCE TRAINING

by

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ABSTRACT

TITLE OF THESIS: Improving Marine Air Intelligence Training

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This paper identifies how the Marine Corps can implement air intelligence training within the Force 2025 force structure such that it provides adequate intelligence support to Marine aviation in the future operating environment.

For decades, observers have consistently identified training shortfalls that prevent the Marine air intelligence community from providing adequate intelligence support to Marine aviation. The Marine Corps, through Force 2025 and other recent efforts, has attempted to address most of the Doctrine, Organization, Training, Materiel, Leadership/Communication Synchronization, Personnel, Facilities, and Cost aspects of improving air intelligence; however, it has yet to adequately address the training changes required. This shortfall presents strategic risk to the Marine Corps and the Intelligence Community by jeopardizing Marine aviation's ability to effectively operate in the future operating environment and by creating a capability gap in the form of intelligence personnel not adequately trained to utilize Intelligence Community production on air and air defense threats.

This study uses the Capabilities Maturity Model, applied to case studies of Marine aviation training reform and Marine air intelligence reform, to understand how and when an

organization becomes a learning organization, gaining effectiveness and efficiency, and achieves the ability to institute effective reforms.

This research finds that Marine aviation is a learning organization with a high degree of process improvement maturity, able to successfully identify and implement process improvements and continually refine them over time. Capabilities Maturity Model analysis of Marine air intelligence has demonstrated that it is not a learning community and has a low level of process improvement maturity, unable to successfully identify or implement process improvements and without an ability to refine attempted improvements over time.

This research concludes that Marine air intelligence must replicate the five major contributing elements to Marine aviation's successful training reform:

- a functional concept that explains how air intelligence supports Marine aviation
- a comprehensive and objective T&R manual
- an authoritative center of excellence
- training and standardization of instructors and unit training program managers
- the articulation of CMMRs linked to readiness reporting requirements

To the scholars and professionals who came before, who had the courage to put their ideas to paper, who may have feared they were shouting into the wind, most of whom retired or left the Service before they saw the change they fought for realized, and whose essential work those who came after built upon.

TABLE OF CONTENTS

A Note on the use of Military Rank

This research extensively discusses and cites academic and professional works by military service members in the context of their calls for or attempts at institutional change. Rank is an integral component of good military order and discipline, but by the very virtue of its inherent value, it can also hinder open institutional discussions and prioritize ideas and objectives on a basis other than merit. With regards to the acceptance of new concepts, rank is can often an indicator of: the breadth of professional and institutional experience of an author, thereby directly affecting the likelihood of acceptance or consideration; how much influence an author is likely to have had in either advocating for their change or being in a position of authority to implement it themselves; and how seriously the institution is likely to consider recommendations for change from an author. Because of this, I have specified the rank of military authors at the time of the writing or actions under discussion rather than omitting rank entirely or using the author's terminal rank (or current rank at the time of the research). For example, when discussing Paul Van Riper's observations during Desert Storm, he is referred as Brigadier General Van Riper, but when discussing his plan to reform Marine Corps intelligence, he is referred to as Major General Van Riper.

INDEX OF FIGURES AND TABLES

Abbreviations

A2AD	Anti-Access/Area Denial
AAR	After-Action Review
AAW	Antiair Warfare
ACE	Air Combat Element
ACEINTSOP	Air Combat Element Intelligence Standard Operating Procedures
ACI	Air Combat Intelligence
ACIO	Air Combat Intelligence Officer
ACM	Air Combat Maneuvering
ACO	Airspace Control Order
ADA	Air Defense Artillery
AFTTP	Air Force Tactics, Techniques, and Procedures (manual)
AIOC	Air Intelligence Officers Course
AirFMFLant	Aircraft, Fleet Marine Force, Atlantic
AirFMFPac	Aircraft, Fleet Marine Force, Pacific
AITSG	Air Intelligence Tactics Study Group
ALMAR	All Marine Corps Activities (message)
ALSA	Air Land Sea Application Center
AMOS	Additional Military Occupational Specialty
AO	Area of Operations
APEX	Adaptive Planning and Execution (system)
ARGP	Aviation Readiness General Project
ASD	Additional Skills Designator

ASR	Authorized Strength Report
ATO	Air Tasking Order
ATS	Aviation Training System
BIC	Billet Identification Code
BMOS	Billet Military Occupational Specialty
C2	Command and Control
C4I	Command, Control, Communications, Computers, and Intelligence
CAS	Close Air Support
CASEVAC	Casualty Evacuation
CCDR	Combatant Commander
CCMD	Combatant Command
CDD	Course Descriptive Data
CE	Command Element
CEP	Circular Error Probable
CG	Commanding General
CI/HUMINT	Counterintelligence/Human Intelligence
CIA	Central Intelligence Agency
CJCS	Chairman of the Joint Chiefs of Staff
CJCSG	Chairman of the Joint Chiefs of Staff Guide
CJCSI	Chairman of the Joint Chiefs of Staff Instruction
CMC	Commandant of the Marine Corps
CMM	Capabilities Maturity Model
CMMR	Core Model Minimum Requirements

CNO	Chief of Naval Operations
CO	Commanding Officer
COA	Course of Action
COC	Combat Operations Center
COMCAM	Combat Camera
CONEMP	Concept of Employment
CONOPS	Concept of Operations
COP	Community of Practice
CRP	Combat Readiness Percentage
DAS	Deep Air Support
DASC	Direct Air Support Center
DC/S Aviation	Headquarters, United States Marine Corps, Deputy Chief of Staff for Aviation
DCA	Headquarters, United States Marine Corps, Deputy Commandant for Aviation
DIAAID	Detect, Identify, Assess, Assign, Intercept, Destroy
DIAP	Defense Intelligence Analysis Program
DIRINT	Marine Corps Director of Intelligence
DivAv	Headquarters, United States Marine Corps, Aviation Division
DOD	Department of Defense
DODD	Department of Defense Directive
DOTMLPF&C	Doctrine, Organization, Training, Materiel, Leadership/Communication Synchronization, Personnel, Facilities, and Cost
DOTMLPF-P	Doctrine, Organization, Training, Materiel, Leadership and education, Personnel, Facilities, and Policy

DRRS	Defense Readiness Reporting System
DS	Direct Support
DST	Direct Support Team
EA	Electronic Attack
EAF	Expeditionary Airfield
ELINT	Electronic Intelligence
EOB	Electronic Order of Battle
ES	Electronic Support
ESAG	Executive Steering Advisory Group
EW	Electronic Warfare
FA	Functional Area
FAC(A)	Forward Air Controller (Airborne)
FARP	Forward Arming and Refueling Point
FDP&E	Force Deployment Planning and Execution
FFCC	Force Fires Coordination Center
FLIC	Flight Line Intelligence Center
FLSE	Flight Leadership Standardization Evaluator
FMFM	Fleet Marine Force Manual
FOB	Forward Operating Base
FOC	Full Operational Capacity
FOE	MCIA's *2015 - 2025 Future Operating Environment: Implications for Marines*
FRAGO	Fragmentary Order
FRS	Fleet Replacement Squadron

FSCC	Fire Support Control Center
FY	Fiscal Year
GCE	Ground Combat Element
GEOINT	Geospatial Intelligence
GIRH	Generic Intelligence Requirements Handbook
H2P	Helicopter Second Pilot
HAC	Helicopter Aircraft Commander
HLZ	Helicopter Landing Zone
HMH	Marine Heavy Helicopter Squadron
HMLA	Marine Light Attack Helicopter Squadron
HQMC AVN	Headquarters, United States Marine Corps, Aviation
HQMC	Headquarters, United States Marine Corps
HUMINT	Human Intelligence
IADS	Integrated Air Defense Systems
IC	Intelligence Community
I-Dept	Headquarters, United States Marine Corps, Intelligence Department
IG	Inspector General
IOC	Infantry Officers Course
IPA	Headquarters, United States Marine Corps, Intelligence Department, Intelligence Plans and Policy Division, Aviation ISR Branch
IPB	Intelligence Preparation of the Battlespace
IPI	Headquarters, United States Marine Corps, Intelligence Department, Intelligence Plans and Policy Division, ISR & Data Management Branch
IR	Intelligence Requirement

IS	Intelligence Squadron
ISG	Intelligence Study Group
ISR	Intelligence, Surveillance, and Reconnaissance
ITI	Intelligence Tactics Instructor
ITS	Individual Training Standards
JFC	Joint Force Commander
JIIM	Joint, Interagency, Intergovernmental, and Multinational
JMPS	Joint Mission Planning System
JP	Joint Publication
JPRC	Joint Personnel Recovery Center
JRA	Joint Rear Area
JWICS	Joint Worldwide Intelligence Community System
KSA	Knowledge, Skills, and Attitudes
LCE	Logistics Combat Element
LVC	Live, Virtual, and Constructive
M&RA	Headquarters, United States Marine Corps, Manpower and Reserve Affairs
MAA	Mission Area Assessment
MACCS	Marine Air Command and Control System
MACG	Marine Air Control Group
MAG	Marine Aircraft Group
MAGTF	Marine Air Ground Task Force
MAL	Mountain Area Landing
MARADMIN	Marine Administrative Message

MARDET	Marine Detachment
MATSS	Marine Aviation Training System Sites
MAW	Marine Aircraft Wing
MAWTS-1	Marine Aviation Weapons and Tactics Squadron One
MAWTU	Marine Air Weapons Training Unit
MAWTULant	Marine Air Weapons Training Unit, Atlantic
MAWTUPac	Marine Air Weapons Training Unit, Pacific
MCAS	Marine Corps Air Station
MCBul	Marine Corps Bulletin
MCCDC	Marine Corps Combat Development Command
MCCLL	Marine Corps Center for Lessons Learned
MCDP	Marine Corps Doctrinal Publication
MCIA	Marine Corps Intelligence Activity
MCIS	Marine Corps Intelligence Schools
MCISRE	Marine Corps Intelligence, Surveillance, and Reconnaissance Enterprise
MCM	Multi-Command Manual
MCMAP	Marine Corps Martial Arts Program
MCO	Marine Corps Order
MCRP	Marine Corps Reference Publication
MCT	Marine Corps Task
MCTIMS	Marine Corps Training Information Management System
MCTP	Marine Corps Tactical Publication
MCWP	Marine Corps Warfighting Publication

MEF	Marine Expeditionary Force
MET	Mission Essential Task
METL	Mission Essential Task List
METOC	Meteorological and Oceanographic
MEU	Marine Expeditionary Unit
MIG	Marine Expeditionary Force Information Group
MIOC	MAGTF Intelligence Officers Course
MISEC	MAGTF Intelligence Specialist Entry Course
MISREP	Mission Report
MOC	Marine Corps Operating Concept
MOJT	Managed On-The-Job Training
MOS	Military Occupational Specialty
MSE	Major Subordinate Element
M-SHARP	Marine Sierra Hotel Aviation Readiness Program
MSIC	Missile and Space Intelligence Center
NA	Naval Aviator
NAO	Naval Aerial Observer
NASIC	National Air and Space Intelligence Center
NATOPS	Naval Air Training and Operating Procedures Standardization (manual)
NAVMC DIR	Navy and Marine Corps Directive
NAVMC	Navy and Marine Corps (publication)
NCO	Non-Commissioned Officer
NDP	Naval Doctrinal Publication

NDS	National Defense Strategy
NFO	Naval Flight Officer
NGIC	National Ground Intelligence Center
NIOBC	Navy Intelligence Officer Basic Course
NMITC	Navy and Marine Corps Intelligence Training Center
NMOS	Necessary Military Occupational Specialty
NMS	National Military Strategy
NSS	National Security Strategy
NTA	Navy Tactical Task
NTTP	Navy Tactics, Techniques, and Procedures (manual)
NVG	Night Vision Goggles
NWP	Navy Warfare Publication
OAAW	Offensive Anti-air Warfare
OAG	Operational Advisory Group
OAS	Offensive Air Support
OccFld	Occupational Field
ODS	Operation DESERT STORM
OIC	Officer in Charge
OJT	On-the-Job Training
ONI	Office of Naval Intelligence
OOB	Order of Battle
OPFOR	Operating Forces
OPLAN	Operation Plan

OPT	Operational Planning Team
ORI	Operational Readiness Inspection
OSINT	Open Source Intelligence
OTE	Organize, Train, and Equip
OTI	Operations and Tactics Instructor
OTTP	Operations and Tactics Training Program
PCA	Permanent Change of Assignment
PCS	Permanent Change of Station
PDO	Publication Development Order
PED	Processing, Exploitation, and Dissemination
PME	Professional Military Education
PMOS	Primary Military Occupational Specialty
POI	Program of Instruction
PTP	Pre-deployment Training Program
PWTI	Prospective Weapons and Tactics Instructor
RAF	(British) Royal Air Force
RCQD	Requirements, Certifications, Qualifications, and Designations
RGR	Rapid Ground Refueling
RITC	Regional Intelligence Training Center
ROMO	Range of Military Operations
ROP	Record of Proceedings
RW	Rotary-Wing
SAM	Surface-to-Air Missile

SASC	Senate Armed Services Committee
SAT	Systems Approach to Training
SCAR	Strike Coordination and Reconnaissance
SEAD	Suppression of Enemy Air Defenses
SI/EW	Signals Intelligence/Electronic Warfare
SIGINT	Signals Intelligence
SIPRNet	Secret Internet Protocol Router Network
SITCC	Squadron Intelligence Training and Certification Course
SME	Subject Matter Expert
SNCO	Staff Noncommissioned Officer
SOP	Standard Operating Procedures
SPMAGTF	Special Purpose Marine Air Ground Task Force
SRIG	Surveillance, Reconnaissance, and Intelligence Group
SWDU	Special Weapons Delivery Unit
SWTU	Special Weapons Training Unit
T&R	Training and Readiness
T/O	Table of Organization
T/O&E	Table of Organization and Equipment
TAC(A)	Tactical Air Coordinator (Airborne)
TACAIR	Tactical (Fighter and Attack) Aviation
TACC	Tactical Air Command Center
TACP	Tactical Air Control Party
TAOC	Tactical Air Operations Center

TECOM	United States Marine Corps Training and Education Command
TEEP	Training and Exercise Employment Plan
TERPES	Tactical Electronic Reconnaissance Processing and Evaluation System
TFSMS	Total Force Structure Management System
TFSP	Total Force Structure Process
TGV	Tactical Ground Vehicle
TMS	Type/, Model /Series
TOECR	Table of Organization and Equipment Change Request
TPFDD	Time-Phase Force and Deployment Data
TR	Tiltrotor
TRADOC	(United States U.S. Army) Training and Doctrine Command
TRAP	Tactical Recovery of Aircraft and Personnel
TTP	Tactics, Techniques, and Procedures
UIC	Unit Identification Code
UJT	Universal Joint Task
UJTL	Universal Joint Task List
UNTL	Universal Naval Task List
USAF	United States Air Force
USMC	United States Marine Corps
USN	United States Navy
UTM	Unit Training Management
VC	(U.S. Navy) Composite Squadron
VEW	Video Exploitation Workstation

VMA	Marine Attack Squadron
VMAQ	Marine Tactical Electronic Warfare Squadron
VMFA	Marine Fighter Attack Squadron
VMGR	Marine Aerial Refueler Transport Squadron
VMM	Marine Medium Tiltrotor Squadron
VMU	Marine Unmanned Aerial Vehicle Squadron
VTC	Video Teleconference
WISC	Wing Intelligence Support Company
WSV	Weapon System Video
WTI	Weapons and Tactics Instructor
WTTP	MCO 3500.109 Weapons and Tactics Training Program

CHAPTER 1

INTRODUCTION

1.A. Air Intelligence Training: The Strategic Imperative

For want of a nail the shoe was lost.
For want of a shoe the horse was lost.
For want of a horse the rider was lost.
For want of a rider the message was lost.
For want of a message the battle was lost.
For want of a battle the kingdom was lost.
And all for the want of a horseshoe nail.

This old proverb, dating back to the middle ages, is a reminder of the importance of the strategic framework, linking ends, ways, and means. In this, the tactical, operational, and strategic levels of war nest to achieve national objectives. However, when a systemic issue exists, limiting the means applied at the tactical level, the problem can have strategic consequences. The strategic framework becomes unbalanced in a systemic way, creating strategic risk, and potentially denying the successful execution of national strategy. Thus, when no blacksmiths in a medieval kingdom's are trained to forge nails, the king has a problem with strategic consequences.

This metaphor is apt for Marine air intelligence, where critical training gaps expose Marine aviation to significant risk in the future operating environment. This risk to the Air Combat Element (ACE) ripples out across the Marine Air Ground Task Force (MAGTF), and ultimately the Joint Force, weakening the ability of the U.S. military to achieve or contribute to national objectives.

In a medieval army, the cavalry is but one maneuver element employed in a tactically-balanced force to effectively achieve military objectives. The Joint Force is constructed similarly.

While there are some intentional redundancies in capability across the Services, each is organized, trained, and equipped for unique missions and aspects of joint missions. This design permits the Joint Force Commander (JFC) to integrate unique Service capabilities to pursue national security objectives. The Joint Force is built in a strategically-balanced manner to achieve military objectives in support of national security strategy.

As a component of this force, the Marine Corps has two primary maneuver forces: one land-based and one aviation. Within the force modernization effort known as Force 2025, the Service has recognized the need for a new approach to training the air intelligence Marines who support the aviation element of its maneuver forces in the future operating environment. To this end, the Marine Corps is preparing to create consolidated air intelligence units, the Wing Intelligence Support Companies (WISC), to improve air intelligence support Marine aviation in the future operating environment. As one of the most significant changes adopted as part of the broader Force 2025 effort, the WISC is intended to provide a force structure that will enable improvements to air intelligence training. Unfortunately, the Service has not yet actually developed a method for how the WISC will conduct this training nor identified the training requirements for which the WISCs are ostensibly being created.

This training deficiency not only presents strategic risk to the Service, but strategic risk to the resources the Intelligence Community (IC) has dedicated to air intelligence across five agencies and centers responsible for authoritative all-source air intelligence production: Missile and Space Intelligence Center (MSIC), National Ground Intelligence Center (NGIC), National

Air and Space Intelligence Center (NASIC), Office of Naval Intelligence (ONI), and Central Intelligence Agency (CIA).

The expertise necessary to generate the intelligence required to support U.S. aviation in the future operating environment exists within these five agencies and centers. Both the Defense Intelligence Analysis Program (DIAP) and CIA's Program of Analysis ensure authoritative production of air intelligence within the IC is well-managed. Critically, however, utilization of intelligence extends beyond the bounds of these five elements to the intelligence Marines within the Operating Forces (OPFOR). The requisite level of training that air intelligence Marines must possess to be able to fully-leverage this expertise does not exist within the Service. This shortcoming represents the weakest link the chain from IC element to warfighter. This poses strategic risk to the IC by severing its ability to effectively communicate its intelligence support to the warfighter.

Through the air intelligence reforms in Force 2025, the Service has recognized the need for a different approach to air intelligence training and is prepared to substantially reorganize the force structure to facilitate this training within the WISCs. But the Service has failed to develop the necessary training content and methodology to ensure air intelligence Marines learn and apply these newly-developed techniques.

1.B. Research Question

This research assumes that the current state of Marine air intelligence is inadequate. The institutional recognition of this deficiency, built upon a body of previous observations (both anecdotal and in formal studies), makes this assumption reasonable. It remains for this research to answer the questions of what changes need to be made and how should they be brought about.

This study seeks to answer the following key research question: how can the Marine Corps implement air intelligence training within the Force 2025 force structure such that it provides adequate intelligence support to Marine aviation in the future operating environment?

1.B.1. Key Questions

Key questions subordinate to the research questions include: What factors have enabled training reform to succeed? What factors have contributed to failed reform within air intelligence? And what changes are necessary to realize efficient and effective air intelligence training reform?

Based on the answers to these questions, this research will attempt to provide specific, actionable, and reasonably complete recommendations for changes to institutional processes and for other actions necessary to implement these changes (e.g., updates to the Intelligence Training and Readiness [T&R] Manual), adapting them to mission needs as they are implemented, and creating required processes and supporting infrastructure so that Marine air intelligence, as a learning community, that can sustain these changes and adapt and evolve into the future.

1.C. Justification for Research

U.S. national objectives and national strategy, to include the National Security Strategy (NSS), National Defense Strategy (NDS), National Military Strategy (NMS), and theater Operation Plans (OPLAN), rely heavily on air power. Increasingly, national strategy has recognized that its strategic competitors have taken advantage of the U.S.'s focus on low-intensity conflict over the last two decades to modernize and improve their capability to compete with U.S. military power, to include technologically-sophisticated and lethal air and air defense forces, posing a serious counter-air threat. As a unique element of the U.S. military with a specialized mission to seize and defend advanced bases (i.e., potentially within the weapons engagement envelope of the adversary), the Marine Corps relies upon its ability to effectively project air power, counter-air, and conduct other missions necessitating use of the air domain, even against advanced adversaries.

Service IC members throughout the Marine Corps Intelligence, Surveillance, and Reconnaissance Enterprise (MCISRE) rely upon the advanced subject matter expertise and technical knowledge of the broader IC in understanding and countering the air threat and to effectively integrate national intelligence capabilities with the tactical intelligence that supports the warfighter. As key players in the final step of the intelligence process (utilization or integration), these OPFOR Service intelligence personnel are a critical element in the IC and its mission, and they are the last members of the IC to handle intelligence before it is utilized. In this way, the broader IC and Service intelligence personnel are mutually supportive.

The shortfalls of Marine air intelligence have been catalogued for decades, consistently identifying shortfalls in training. While there have been multiple attempts to fix the problem, all have fallen short of the mark. Because the ACE is an integral element in the MAGTF, adequate intelligence support to the ACE is critical to MAGTF success. And with national strategic guidance to the Service to prepare for a future operating environment where there will be a significant counter-air threat, this becomes even more important. As a consequence, the Service is undertaking dramatic action to reshape Marine air intelligence in a way that can both maximize the impact of existing improvements and set critical conditions to sweeping change. If executed as intended, this change will finally result in significant advances in the capability and improvement of Marine air intelligence needed by the Service to fight and win in future operating environments.

Unfortunately, the dramatic changes in force structure that the Service is preparing to implement, while necessary, are not sufficient as they do not provide for improvements to air intelligence training. The Service must take at least one more step in addressing the training shortfalls that have plagued Marine air intelligence since its inception: determine the requirements necessary to prepare air intelligence Marines to support Marine aviation in the future operating environment and provide an improved method for training to those requirements. This research intends to address this last mile of training improvement and provide a solution that is feasible, suitable, and complete.

1.C.1. Why this Study is Unique

Because of the placement of OPFOR Service intelligence personnel, they are primarily concerned with support to operational commanders and rarely directly contribute directly to formal IC production requirements. For their part, the IC has largely ignored these personnel, often unable to influence their organization, training, equipping, or tasking. When the IC is concerned with Service intelligence capabilities, it instead focuses on the elements it can directly influence: Service intelligence centers (e.g., Marine Corps Intelligence Activity [MCIA]) and Service headquarters intelligence staff (e.g., Headquarters, United States Marine Corps, Intelligence Department [I-Dept]).

This convenient fiction, where the IC and Services' OPFOR intelligence personnel represent two distinct realms, has served both the IC and operational components of the Services reasonably well. But it is not true. And the increasingly-strategic implications of tactical actions and tactical intelligence capabilities projected in national strategy make this separation increasingly untenable.

National Intelligence University provides a unique academic venue to re-marry these two perspectives, study where they mutually-support, and to address the strategic implications of this area of research. As an academic environment that gathers students and faculty with backgrounds from the strategic to the tactical, from civilian and military, and from all IC elements, it offers an unrivaled environment to explore where the intelligence enterprises of the Services and those of other IC elements meet and blend, where the strategic and national impacts of what might otherwise be considered a tactical problem (training unit intelligence personnel) can be explored in the context of U.S. national strategies and the future operating environment.

The Marine Corps Director of Intelligence (DIRINT) has recognized the strategic value of research conducted by Marines at institutions like National Intelligence University:

> For one to three years, these officers are immersed in highly technical Masters and Doctorate level degree programs … The knowledge and experience they gain directly, the state of the art facilities where they study, and the immensely talented people who constitute their professors, mentors, and colleagues make these fifty or so Marines chosen each year uniquely prepared to understand the challenges and opportunities within the MICSRE and drive Enterprise capability evolution.[1]

And under the DRSP, the Service, through the DIRINT, has formally sponsored this research topic as supporting MCISRE priorities (although such sponsorship does not imply endorsement of the views expressed in this research).[2]

Marine aviation is also unique among all other Service aviation components and within the Marine Corps. It has specialized command relationships (within the MAGTF and between the MAGTF and the Joint Force), planning cycles, orders processes, operational reach, and a

[1] Marine Corps Director of Intelligence, "Marine Corps ISR Enterprise Initiative: Director of Intelligence Research Sponsorship Program" (Washington, D.C.: Headquarters, United States Marine Corps, Intelligence Department, October 2018), 3.

[2] Marine Corps Director of Intelligence, "Sponsorship of Research Being Conducted by Captain Christopher A. Denzel" (Washington, D.C.: Headquarters, United States Marine Corps, Intelligence Department, November 14, 2018).

threat that relies heavily on advanced scientific and technical concepts and principles that find no analog in the ground component.[3] This all makes aviation, generally, and Marine aviation, specifically, a unique supported entity with unique intelligence support requirements. Thus, a study of Marine air intelligence will have different parameters and come to different conclusions than a generic study of Marine intelligence, a study of Marine intelligence support to another MAGTF element, or a study of intelligence support to another Service's aviation component.

Therefore, this research and the institution at which it is conducted present a unique contribution that can have strategic and Service-wide impact (and in doing so, impact to the Joint Force and the achievement of national objectives) that is not otherwise available to the Service.

1.D. The Problem

For decades, observers within Marine air intelligence, Marine aviation, and think tanks have consistently identified training shortfalls in Marine air intelligence and called for change, broadly and specifically. Efforts at change, when they have been made at all, have occurred in a piecemeal fashion and not within the context of a coherent strategy for air intelligence, Marine Corps intelligence, or as part of a Service-wide strategy for change. As a consequence of this disconnect, coupled with the diffuse force structure of Marine air intelligence, past efforts have resulted in only marginal improvements, with their full potential unrealized.

The end result is a Marine air intelligence community unable to provide adequate intelligence support to Marine aviation, today or in the future operating environment.[4]

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[3] Headquarters, United States Marine Corps, *MCWP 3-20 Aviation Operations* (Washington, D.C.: Headquarters, United States Marine Corps, 2016), 4-4, 4-7, 5-1, 5-6, 5-7.

[4] Joseph Freshour, "Marine Corps Aviation Intelligence: A Doctrine, Organization, Training, Material, Leadership, Personnel, Facilities and Policy Analysis" (master's thesis, U.S. Army Command and General Staff College, 2015), 68.

The Marine Corps, through Force 2025 and other recent efforts, has attempted to address most of the Doctrine, Organization, Training, Materiel, Leadership/Communication Synchronization, Personnel, Facilities, and Cost (DOTMLPF&C) aspects of improving air intelligence; however, it has yet to adequately address the training changes required. This shortfall presents strategic risk to the Marine Corps and the Department of Defense (DOD) by jeopardizing Marine aviation's ability to operate effectively in the future operating environment and, consequently, for the Marine Corps to fully execute its capstone operating concept, the Marine Corps Operating Concept (MOC), as a part of the Joint Force and in support of theater and national objectives. This shortfall also presents strategic risk to the IC by creating a capability gap in the last step of the intelligence process/cycle (integration/utilization) by intelligence personnel not adequately trained to utilize the production of IC elements responsible for authoritative all-source intelligence production on air and air defense threats (i.e., MSIC, NGIC, NASIC, ONI, and CIA).

1.E. Hypothesis

This research hypothesizes that: by understanding the success of Marine aviation training reform and Marine air intelligence training reform failures, the Marine air intelligence community can identify and direct the specific training reforms necessary to complete planned air intelligence force modernization as well as to adopt mechanisms to sustain this reform and continue optimizing the organization into the future, closing the current training gap and mitigating strategic risks.

1.F. Definitions

Air intelligence has been variously defined throughout its history. When referring to a topical area, its original definition covered intelligence collected from aerial platforms (i.e., air reconnaissance). In World War II, as aviation missions became more complex, requiring tailored intelligence support to plan, brief, and execute, it came to also mean the intelligence supporting aviation mission planning, briefing, and execution (and, as an aviation mission, this includes intelligence support to air reconnaissance). It can also refer to a personnel/occupational field that supports either of these definitions. The Marine Corps doctrinal definition combines the second definition and the personnel who provide it, defining air intelligence as "the combination of all-source intelligence, training, personnel, and techniques that assesses the weather, adversary, and terrain impacts to the air domain."[5] This study uses this Service doctrinal definition, referring variously to the topical area, the personnel, or the combination of the two, depending on context.

Because this research takes place within the context of the Service and its training frameworks, this study also uses specific definitions and concepts that have Service-specific meaning and require definition or explanation within this context. These definitions are collected in Appendix O.

1.G. Assumptions

Because this research seeks to answer the question of *how* air intelligence training can be improved, it must make assumptions about the construct in which air intelligence will take place. Thus, this research makes the assumption that the WISC will be fully implemented. If the WISCs are not implemented or only partially implemented, the conclusions from this research will remain valid, although their specific implementation may require modification.

A number of other, more minor assumptions are made by this research and are indicated throughout the work.

[5] Headquarters, United States Marine Corps, *MCRP 2-10A.9 Air Intelligence* (Washington, D.C.: Headquarters, United States Marine Corps, unpublished draft), 1.

1.H. Limitations and Scope

As this research is focused on improving air intelligence training and T&R manuals are how the Service codifies knowledge and skill requirements for a given Occupational Field (OccFld) or Military Occupational Specialty (MOS), research will be primarily oriented to recommended structural (e.g., framework and methodological) and content changes within the Intelligence T&R Manual, its implementation, and associated documents or issues. However, training takes places in the context of factors outside the strict training and education pillar (i.e., the "T") of DOTMLPF&C (e.g., the personnel available to train, the organizational structure that dictates the billets they are to hold and therefore must be trained to). Additionally, training is intended to achieve and maintain operational readiness (which brings to bear all elements of the DOTMLPF&C spectrum). Therefore, this research must, where appropriate, draw limited or tentative conclusions or recommendations in areas outside training and education. In some cases, these conclusions will be integral to this implementation of this research's findings. In other cases, these will be areas for future research.

This research will not attempt to establish the requirement for improving air intelligence training as this is already thoroughly established in previous research and the conclusions of this research have been accepted as an integral premise for Force 2025 modernization of air intelligence.[6] The literature on these shortfalls is covered in Chapter 3.

The heterogeneous nature of other Services' OccFlds and training frameworks preclude a broader scope of research that might otherwise identify areas for air intelligence training

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[6] Christopher Paul et al., "*Alert and Ready: An Organizational Design Assessment of Marine Corps Intelligence*. (Santa Monica, CA: RAND Corporation, 2011), 52. Freshour, 68. Headquarters, United States Marine Corps, Intelligence Department, *Wing Intelligence Support Company (WISC) and Intelligence Squadron (IS) Concept of Employment* (Washington, D.C.: Headquarters, United States Marine Corps, unpublished draft), 5.

improvement across all Services.[7] Additionally, while research will identify changes to the Intelligence T&R Manual, this research limits itself to the Service's current approach to training design (i.e., it will not explore fundamentally different approaches to the Service's Unit Training Management [UTM] program or Systems Approach to Training and Education).

Due to the limitations of my subject matter expertise, the comparative importance of all-source intelligence Marines (i.e., 0202, 0207, 0271, and 0277 MOSs) to air intelligence, and to manage scope, this research will focus on improving all-source intelligence Marines training, with only limited mention of or tentative conclusions pertaining to specialist intelligence MOSs (e.g., 68xx, 26xx, 0241, 0261).

Additionally, this research will focus on supporting the flying elements of the ACE (i.e., its squadrons) and their headquarters (Marine Aircraft Groups [MAG] and Marine Aircraft Wings [MAW]). Support to aviation ground units (i.e., MACG and its subordinates) has, unfortunately, been historically neglected within the air intelligence community. This research, regrettably, continues that neglect. This is in part due to the already wide scope of the research. Full treatment of this issue would require significant exploration of overlaps between MACG intelligence support and existing ground intelligence MOSs (i.e., 0203, 0231) and their T&R events. This would excessively expand the scope of this research. This is, however, an area that is highly deserving of future study.

1.I. Overview of Remaining Chapters

Chapter 2 presents the strategic-to-tactical implications of air intelligence in the context of national and Service strategies.

[7] This heterogeneous nature includes, but is not limited to, disparate: coded/designated career OccFlds, formal school and informal training environments, training program construction and training and/or education commands, degree of specialization, the organic and non-organic nature of intelligence force structure, supported aviation platforms, and Service missions.

Chapter 3 reviews the literature on past efforts to identify shortfalls in air intelligence or intelligence training. These documents represent not only the very limited body of academic work on the subject but also the academic foundation on which current air intelligence force modernization efforts are based.

Chapter 4 presents the research methodology, justification for data collection, design of the case studies, and how research conclusions will be validated.

Chapter 5 provides a history of Marine aviation training reform. It traces the development of organizations, manuals, and processes that have been implemented to improve aviation readiness since World War II, generally, in the categories of: pilot training progression models, training centers of excellence, and the development of the T&R manual.

Chapter 6 provides a history of Marine air intelligence, generally, and focuses on efforts to improve Marine air intelligence, specifically. It traces the history of the subject in eras, broken down generally by decade: the pre-1990s era; the 1990s, with the 'Van Riper Plan' and the creation of the 0277 Intelligence Weapons and Tactics Instructor (WTI) MOS; the 2000s, with the creation of the Ground T&R Program and Air Intelligence Officers Course (AIOC); and the 2010s, with a growing number of studies and observations that efforts to improve air intelligence have fallen short.

Chapter 7 analyzes the case studies, individually and in juxtaposition, in the context of the Capabilities Maturity Model (CMM), identifying the elements of aviation training reform that enabled progression and maturity along this model as well as where air intelligence has failed to make progress.

Chapter 8 develops specific recommendations from this analysis and identifies areas for further research.

Appendix A through Appendix N provide detailed discussion on and further explanation of the conclusions in Chapter 8, making specific recommendations for implementation of research findings.

Appendix O provides definitions for concepts in this research that are critical, Service-specific, or with specific definitions not immediately apparent to those outside the community.

CHAPTER 2

STRATEGIC TO TACTICAL IMPLICATIONS OF AIR INTELLIGENCE

Strategic objectives drive the development of operational and tactical capabilities that enable the tactical actions (both operations and intelligence) that, when appropriately directed, achieve or contribute to national security objectives. National strategies (identifying strategic ends), operational and tactical actions (ways), and military capabilities (means) are interdependent. Understanding the strategic implications of military capabilities requires an understanding of these strategy documents and how they are designed to nest within one another.

The force design of the Marine Corps allows it to uniquely contribute to national security through its MAGTF construct (of which aviation is a critical component) and ability to operate in littoral and expeditionary environments. Written in 2015, MCIA's *2015 - 2025 Future Operating Environment: Implications for Marines* (FOE) forecasts the strategic threat context in which the Service must be prepared to operate to achieve its component of Joint Force objectives in pursuit of national strategy. The FOE provides "a baseline forecast of the operating environment that Marines face today, the global trends that will most affect the environment, and the influence those trends will have on the environment over the next decade."[8] The FOE concludes:

> the threats, challenges, and opportunities presented to Marines in the 2015-2025 time period … will evolve in ways that the current force is not postured to address … Our adversaries will challenge the United States military through a mixture of proxy, hybrid, and conventional forces using weapons and technologies that will mimic, if not close, the parity gap.[9]

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[8] Marine Corps Intelligence Activity, *2015 - 2025 Future Operating Environment: Implications for Marines* (Quantico, VA: Marine Corps Intelligence Activity, June 23, 2015), 5.

[9] Ibid.

The FOE thus establishes the impetus for Force 2025's modernization efforts in the context of national strategy, while the *MCISRE Plan 2015-2020*'s *MCISRE Supporting Strategy for Aviation Intelligence* establishes the importance of air intelligence and air intelligence training in enabling the Service to execute the MOC in support of these strategies. While air intelligence is far from the only critical intelligence capability, these documents formally recognize it as a strategic intelligence enabler of the MAGTF in support of national strategy.

2.A. National Strategy

The military component of U.S. national strategy is articulated in the NMS, nested under the NDS, nested in turn under the NSS.

2.A.1. National Security Strategy

The 2017 NSS identifies a '2+2+1' framework to describe competitors and adversaries in the current strategic environment. Foremost among them are China and Russia, followed by Iran and North Korea, and lastly by "transnational threat organizations, particularly jihadist terrorist groups."[10] The specific military challenges posed to the U.S. are "military capabilities designed to deny America access in times of crisis and to contest our ability to operate freely," and in response, the U.S. military must "restore the readiness of our forces for major war."[11] Within the strategic objective to "Preserve Peace Through Strength," the NSS identifies five priority actions for the military in pursuit of NSS goals:

- modernization
- acquisition
- capacity
- improve readiness
- retain a full-spectrum force[12]

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[10] President of the United States of America, *National Security Strategy of the United States of America* (Washington, D.C.: The White House, December 18, 2017), 2, 25.

[11] Ibid., 27-28

[12] Ibid., 28

Three of these bear upon this research. "Modernization" calls for increasing survivability and lethality. In addition to the expected calls for new and more capable weapon systems, this action also calls for a focus on increasing survivability and lethality of existing military forces and equipment. With respect to aviation forces facing an anti-area/access denial (A2AD) challenge, one way to achieve these ends is improved intelligence support. "Improve readiness" focuses on training in addition to logistics and maintenance, and "retain a full-spectrum force," calls for "new operational concepts and capabilities to win without assured dominance in the air," among other domains.[13]

2.A.2. National Defense Strategy

The 2018 NDS supports the 2017 NSS, providing DOD strategic guidance to enable the achievement of the national goals outlined in the NSS. To do so, it identifies three lines of effort:

- build a more lethal force
- strengthen alliances and attract new partners
- reform the department for greater performance and affordability[14]

As components of the first line of effort, the NMS calls for building lethality in contested environments (to include "inside adversary air and missile defense networks"), investing in forces that can "deploy, survive, operate, maneuver, and regenerate in all domains while under attack," and developing novel operating concepts.15

2.A.3. National Military Strategy

The 2018 NMS is the Chairman of the Joint Chiefs of Staff's (CJCS) "strategic framework to inform the prioritization of force employment, force development, and force

[13] Ibid., 29.

[14] Secretary of Defense, *Summary of the 2018 National Defense Strategy of The United States of America* (Washington, D.C.: Department of Defense, 2018), 5, 8, 10.

[15] Ibid., 6-7.

design for the Joint Force," providing the 'how' to the NDS's 'what.'[16] The NMS's strategic guidance is to contribute to NDS objectives through three "strategy horizons," preparing the Services to achieve Joint Force and national security objectives while accepting the uncertainty of "when, where, or under what conditions the next fight will occur:" force employment (0-3 years), force development (2-7 years), and force design (5-15 years).[17]

2.A.4. Service Implication of National Strategy

These national strategy documents establish both the objectives towards which these Service functions will be applied as well as the threat context in which they will be employed to do so.

The U.S.'s primary strategic competitors, China and Russia, have observed its ability to fight wars "quickly, from stand-off distances and with minimal casualties" when "uncontested or dominant … in every operating domain."[18] In response, China and Russia have pursued aggressive military modernization specifically designed to contest and deny this domain superiority, "eroding military advantages [and] undermining the Joint Force's ability to defend the homeland, deter nuclear war, and deter and defeat adversaries."[19] The threat context is thus an A2AD environment in which "Our ability to project military power," as the critical advantage required to defeat a conventional adversary, is seriously challenged.[20]

The Marine Corps' task in support of these strategies, then, is to be able to provide forces to the JFC that are organized, trained, and equipped to operate in this A2AD environment, with

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[16] Chairman of the Joint Chiefs of Staff, *2018 National Military Strategy* (Washington, D.C.: Chairman of the Joint Chiefs of Staff, 2018), 3.

[17] Ibid., 8-9.

[18] President of the United States of America, 27. Secretary of Defense, *Summary of the 2018 National Defense Strategy of The United States of America,* 3.

[19] Chairman of the Joint Chiefs of Staff, *Capstone Concept for Joint Operations: Joint Force 2030* (Washington, D.C.: Chairman of the Joint Chiefs of Staff, unpublished draft), 7.

[20] Ibid., 5.

maneuver forces capable of surviving, finding, and destroying enemy A2AD weapon systems. And as these systems become more advanced and specialized, so too does the training necessary to understand them and support the forces that must contest them.

2.B. The Marine Corps' Role

As an integral part of the Joint Force, the Marine Corps' role is outlined by law (Title 10 U.S.C.) and directive (Department of Defense Directive [DODD] 5100.01).

Title 10 mandates a Marine Corps organized, trained, and equipped with no less than three combat divisions and three air wings "to provide fleet Marine forces of combined arms, together with supporting air components, for service with the fleet in the seizure or defense of advanced naval bases and for the conduct of such land operations as may be essential to the prosecution of a naval campaign."[21]

DODD 5100.01 Functions of the Department of Defense and Its Major Components elaborates on these responsibilities:

> In addition to the common military service functions listed in [this Directive] and pursuant to section 5063 of [Title 10], the Marine Corps, within the Department of the Navy, shall develop concepts, doctrine, tactics, techniques, and procedures and organize, train, equip, and provide forces, normally employed as combined arms air ground task forces, to serve as an expeditionary force-in-readiness, and perform the following specific functions:
> (1) Seize and defend advanced naval bases or lodgments to facilitate subsequent joint operations.
> (2) Provide close air support for ground forces.
> (3) Conduct land and air operations essential to the prosecution of a naval campaign or as directed.
> (4) Conduct complex expeditionary operations in the urban littorals and other challenging environments.
> (5) Conduct amphibious operations …
> (6) Conduct security and stability operations and assist with the initial establishment of a

[21] National Security Act of 1947, Public Law ch. 343, § 206, *U.S. Statutes at Large* 61 (1947): 502, codified at *U.S. Code* 10 (2018), § 5063.

military government pending transfer of this responsibility to other authority.
(7) Provide security detachments and units for service on armed vessels of the Navy, provide protection of naval property at naval stations and bases, provide security at designated U.S. embassies and consulates, and perform other such duties as the President or the Secretary of Defense may direct.[22]

2.B.1. Marine Corps Intelligence Activity's Future Operating Environment

In 2015, the FOE was written to outline the specific strategic operational and threat context in which the Service will have to execute its component of Joint Force operations. The FOE was designed to inform the three strategy horizons identified in the NMS (force employment, force development, and force design).

The FOE identifies five major trends that will challenge the Marine Corps:

- the speed of adversaries as enabled by global communications and social media
- the lag of the U.S.'s industrial-age acquisitions process as compared to commercial availability of similar or superior technologies
- the deliberate creation of ambiguity in future conflicts
- the proliferation of advanced weapons
- the desire of adversaries to seek overmatch in the information environment[23]

"The proliferation of advanced weapons" is especially relevant to air intelligence, generally, and this research, specifically:

> Proliferation of advanced weapons has globally spread long-range stand-off weapons such as anti-ship cruise missiles, precision-guided munitions, and surface-to-air missiles. The reach of modern stand-off weapons and associated targeting systems are so great that Marines will be constantly under threat rings of these systems; they will not have the luxury of starting operations without the enemy's knowing it. Not only will near-peer states have Anti-Access/Area Denial … capability; numerous adversaries will have at least some capability, to challenge U.S. operational access.[24]

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[22] Secretary of Defense, *DODD 5100.01 Functions of the Department of Defense and Its Major Components* (Washington, D.C.: Department of Defense, December 21, 2010), 31-32.
[23] Marine Corps Intelligence Activity, 5.
[24] Ibid.

The FOE also articulates unique capabilities the Service provides in support of national strategy and the implications for this unique contribution in the future operating environment:

> The proximity of the world's oceans to regions of instability and crisis makes a seagoing response force of inherently special value. Still, many inland crisis hot spots may require the projection of forces at a long range from staging areas. Marines must be cognizant that their ability to maneuver vastly outstrips their ability to provide for other warfighting functions. In many cases, these inland crisis hot-spot missions will also outstrip the joint force's ability to support Marines in early operational phases. With the proliferation of modern weaponry across developing nations, the responding force may not have the distinctive intelligence, surveillance, and reconnaissance (ISR) and firepower superiority that have marked past U.S. operations.[25]

Thus, the FOE traces statutory Service responsibilities in support of higher-order strategy and concept documents down to the projected future operating environment and concludes that the Service is not ready to operate against these challenges. It therefore establishes the Service-specific problem frame in which Force 2025 takes place.

2.B.2. Marine Corps Operating Concept

Designed to support Joint operational concepts, the MOC is the Marine Corps' capstone operating concept for how it will fulfill its Title 10 responsibilities in the future operating environment.

When employed in accordance with the MOC, MAGTFs aboard amphibious shipping enjoy an asymmetric advantage over adversaries, enabling access into denied or contested environments to ensure the Marine Corps can deliver the expeditionary combined arms it is designed to provide the Joint Force.

The MOC recognizes that the strategic challenges of the future operating environment will "impact how we organize our Corps and ultimately fight our Nation's battles," establishing a

[25] Ibid., 14.

concept that both “[describes] in broad terms how the Marine Corps will operate, fight, and win in 2025 and beyond; and [shapes] our actions as we design and develop the capabilities and capacity of the future force.”[26] The MOC identifies technology proliferation as one of the key drivers of change that necessitate this new concept. The key challenge presented by this proliferation is the relative ease it provides adversaries in developing A2AD capabilities, to include the fact that “Increasingly lethal counter-air weapons and their growing availability even to non-state actors will further challenge our use of low-altitude airspace for maneuver, supply, and fire support.”[27]

Ultimately, the MOC concludes that “The Marine Corps is currently not organized, trained, and equipped to meet the demands of a future operating environment,” setting the stage for Force 2025 efforts to modernize the force and enable the Service to fulfill its responsibilities to the Joint Force.[28]

2.B.3. Force 2025

In 2015, the 36th Commandant of the Marine Corps (CMC), General Joseph Dunford, issued planning guidance to the Service, acknowledging that the Service had accepted risk that had negatively impacted the Service’s ability to fulfill its role in Joint Force operations in the future operating environment.[29] General Dunford’s guidance called attention to the A2AD environment as the central threat to the Marine Corps mission and called on the Service to prioritize efforts to facilitate its ability to operate “from the sea in this Anti-Access, Area Denial

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[26] Commandant of the Marine Corps, *The Marine Corps Operating Concept: How an Expeditionary Force Operates in the 21st Century* (Washington, D.C.: Headquarters, United States Marine Corps, September 2016), i, 4.

[27] Ibid., 5.

[28] Ibid., 8.

[29] Commandant of the Marine Corps, *U.S. Marine Corps 36th Commandant’s Planning Guidance* (Washington, D.C.: Headquarters, United States Marine Corps, January 23, 2015), 2.

… threat environment."[30] With this focus, the CMC commissioned the FOE to understand the environment and the MOC to design a concept to operate effectively within it.

When General Robert Neller became the 37th CMC in 2016, he issued *Fragmentary Order (FRAGO) 01/2016: Advance to Contact*. In it, he stated that the 36th CMC's guidance remained in effect.[31] The 36th CMC's guidance, the FOE, and the MOC all emphasize that the demographics and geography of the most likely environments for conflict in the future operating environment will be in littoral and expeditionary environments, where the Marine Corps has unique Service capabilities, thus making unique contributions to the NMS. FRAGO 01/2016 reiterates this and issues guidance to the Service to achieve this by focusing on five areas:

- people
- readiness
- training / simulation / experimentation
- integration with the naval and joint force
- modernization and technology[32]

Three of these five focus areas are especially relevant to this research. "People" includes the conduct of a comprehensive force structure review.[33] "Readiness" pushes the Service towards "standards-based inspections, evaluated drills, and training exercises" to reflect a "culture of standards and readiness."[34] And "Training, Simulation, and Experimentation," evolves the approach to training to aggressively test new concepts and improve the realism and relevance of training.[35]

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[30] Ibid., 10.

[31] Commandant of the Marine Corps, *FRAGO 01/2016: Advance to Contact* (Washington, D.C.: Headquarters, United States Marine Corps, January 19, 2016), 1.

[32] Ibid., 3.

[33] Ibid., 4.

[34] Ibid., 6.

[35] Ibid., 7-8.

Responding to the central problem of the MOC, General Neller initiated a force modernization effort, named Force 2025, to "design a Marine Corps that is organized to adapt and operate effectively despite operational imperatives (threat, environment, mission), and improve efficiency in meeting increasing demands from the geographic combatant commanders for ready and relevant forces across the range of military operations."[36]

Phase I of Force 2025 consisted of Course of Action (COA) development for a number of modernization efforts across the Service and was completed in July 2016. Phase II took the approved COAs and developed an "integrated and executable implementation plan."[37]

Force 2025 had a flaw, however. Its execution was focused on only the organize and equip responsibilities of the Service, sidestepping the training responsibility. Force 2025 officially culminated with the entering of the changes "into the Total Force Structure Management System (TFSMS) Authorized Strength Report (ASR)" in Fiscal Year (FY) 2017.[38] Fundamentally, this is why the Service's solution to the problem is not yet complete.

Within air intelligence, Force 2025 makes significant changes to force structure, elevating the rank of MAG and F-35 intelligence officers, establishing additional liaisons within the IC, and establishing the WISCs. However, as with Force 2025, generally, these changes do not provide a plan to improve air intelligence training—the one air intelligence shortfall routinely identified over decades and cited as a central issue that WISCs are designed to address.[39]

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[36] Commandant of the Marine Corps, *MARADMIN 386/16 Force 2025 Phase II Way Ahead and Actions* (Washington, D.C.: Headquarters, United States Marine Corps, July 28, 2016).

[37] Ibid.

[38] Ibid.

[39] Headquarters, United States Marine Corps, Intelligence Department, *Wing Intelligence Support Company (WISC) and Intelligence Squadron (IS) Concept of Employment,* 11.

2.B.4. Marine Aviation's Strategic Role

Marine aviation plays a unique role in Service doctrine and operating concepts, a critical enabler that allows the MAGTF to 'punch above its weight.' With Marine aviation, a MAGTF provides theater commanders a tactical force able to achieve both operational and strategic impacts. Thus, a sea-based MAGTF provides a credible and capable force that can be positioned in strategic areas to "indicate U.S. political concern or resolve on a volatile issue" or to show U.S. presence that assures allies and deters potential enemies.[40] The MAGTF's expeditionary capabilities, whether deployed aboard naval shipping or to expeditionary advanced bases, enable the Marine Corps to provide the nation with flexible response options, the "force of choice whenever political considerations preclude a deliberate build-up of forces and their supporting infrastructure" while retaining the ability to strike "targets of strategic value."[41]

Because the MAGTF carries with it limited "organic [ground] fire support and mobility assets" (which must be moved ashore to be employed), it relies "heavily on the fires, fire support, and mobility provided by Marine aviation," which "extends the operational reach of the MAGTF and enables it to accomplish operational objectives designed to achieve strategic goals."[42] This combined arms capability, coupled with the expeditionary character of the MAGTF, makes the MAGTF ACE unique in U.S. military aviation.[43]

Furthermore, Marine aviation provides the MAGTF a uniquely-capable tool to conduct maneuver warfare against potential enemies, "[expanding] the operational reach of the MAGTF,

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[40] Headquarters, United States Marine Corps, *MCWP 3-20 Aviation Operations*, 1-5.
[41] Ibid., 1-6.
[42] Ibid., 1-1.
[43] Ibid.

potentially exposing a wide range of the enemy's potential critical vulnerabilities to attack" as compared to a similarly-sized and equipped ground-only force.[44]

While the ACE is principally employed as a component of the MAGTF, it has unique and habitual command relationships to the JFACC (the component within a Joint Force primarily responsible for the Joint Force's aviation operations), giving Marine aviation an inherent connection with strategic and operational objectives even if the remainder of the MAGTF is used to pursue only tactical objectives.[45]

Finally, because Marine aviation is equally capable of operating at sea as ashore, within the context of current national security priorities, it is one of the few capabilities in the Joint Force equally relevant in a military confrontation with either of the U.S.'s two leading strategic competitors—any confrontation with Russia is likely to take place inland, placing primary emphasis on land-based forces and any confrontation with China is likely to take place at sea and among disparate islands or from sea bases.

2.B.5. Marine Corps Intelligence, Surveillance, and Reconnaissance Enterprise Supporting Strategy for Aviation Intelligence

The *MCISRE Plan 2015-2020*, as the Annex B (Intelligence) to the Marine Corps Service Campaign Plan, is the DIRINT's plan for developing a MCISRE that provides the Service with the requisite intelligence support required for its mission in the future operating environment, thus supporting the MOC and, in turn, national strategy objectives.

The MCISRE plan includes an appendix 11 (MAGTF ISR Operations) to the plan with a tab B (Airborne ISR Operations), which identifies air intelligence-specific shortfalls and goals for improvement. This Tab B, the *MCISRE Supporting Strategy for Aviation Intelligence*,

[44] Ibid., 2-5.
[45] Ibid., 4-4.

articulates the air intelligence mission as delivering "timely, accurate, and relevant intelligence support to the six functions of Marine Corps Aviation."[46]

The supporting strategy identifies three key shortfalls within Marine air intelligence:

> a lack of aviation intelligence training throughout the force; a lack of structure within the Intelligence Community (IC) and at the group and squadron levels that does not allow for the access and development needed in the community; and, there is a need for more experienced and mature aviation intelligence professionals.[47]

The *MCISRE Supporting Strategy for Aviation Intelligence* has sought to address the second and third shortfalls identified above by the creation of the WISC and the elevation of certain air intelligence billets in rank (and the establishment of three new liaison billets within the IC), providing an 'air intelligence career path.'

The WISC was developed from a review of Service shortfalls in providing adequate intelligence support to Marine aviation in support of the MOC, which found consistent dissatisfaction with the level of intelligence support provided to Marine aviation.[48] Force 2025, generally, and the WISC, specifically, are intended to address these issues by fundamentally altering the force structure, force generation model, and training of air intelligence Marines throughout the MAWs.

However, consistent with the organize- and equip-focus of Force 2025, the first shortfall identified in the *MCISRE Supporting Strategy for Aviation Intelligence* (training) has not been addressed at all.

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[46] Marine Corps Director of Intelligence, *MCISRE Decision Memorandum 3-17 Marine Corps Intelligence, Surveillance, and Reconnaissance Enterprise Supporting Strategy for Aviation Intelligence* (Washington, D.C.: Headquarters, United States Marine Corps, Intelligence Department, February 10, 2017), 4.

[47] Ibid., 3.

[48] Headquarters, United States Marine Corps, Intelligence Department, *Wing Intelligence Support Company (WISC) and Intelligence Squadron (IS) Concept of Employment,* 11.

2.C. The Marine Corps' Role in the Intelligence Community

The IC exists to support all levels and elements of national power, from diplomacy to military intervention, the strategic level of war down to the tactical. Within the IC, there are five authoritative producers of all-source intelligence related to air intelligence (i.e., air and air defense topics): MSIC, NASIC NGIC, ONI, and CIA. These producers, while experts in their respective intelligence topics, rely on trained and knowledgeable consumers in the OPFOR of the Services. These OPFOR intelligence personnel are the last people to touch intelligence before it reaches the final step of the intelligence cycle: utilization and integration. This necessitates trained and capable OPFOR intelligence personnel to both tailor this authoritative intelligence into the forms most appropriate to support the warfighter as well as to communicate to these producers the necessary intelligence requirements of those warfighters to ensure the IC is producing the most relevant and timely intelligence.

As the only Service whose Service Intelligence Center is missing from this list, the Marine Corps carries more of a burden to ensure its OPFOR intelligence Marines are adequately trained understand the intelligence production responsibilities and capabilities of these entities, as well as the scientific and technical intelligence necessary to understand sophisticated systems associated with air and air defense threats.

2.D. Summary

The NSS establishes the national security objectives of the U.S. The NDS and NMS identify the military contributions to this strategy. All three documents establish the threat context (i.e., A2AD) in which U.S. military must be able to operate to ensure or achieve these strategic objectives. The Marine Corps, as a unique and integral part of the Joint Force, has defined the elements of the threat context it must overcome (the FOE), designed an operational concept to do so (the MOC), and has initiated a force modernization process to develop the capabilities to execute this concept (Force 2025). As the head of the Marine Corps IC element, the DIRINT has developed a supporting strategy (*MCISRE Plan 2015-2020*) as well as subordinate strategies (including the *MCISRE Supporting Strategy for Aviation Intelligence*) to ensure the Service has adequate intelligence support to achieve its component of Joint Force and national security objectives. The MCISRE Supporting Strategy for Aviation Intelligence identifies the need for improved air intelligence training, establishing the linkage between this training and the achievement of national security objectives.

However, neither the *MCISRE Supporting Strategy for Aviation Intelligence* nor any element of Force 2025 has identified these training requirements, how to conduct this training, or what supporting mechanisms are required to ensure its effectiveness. This essential, strategic gap is the subject of this research.

CHAPTER 3

LITERATURE REVIEW

Unsurprisingly, there is a dearth of previous scholarship on the relatively niche subject of Marine air intelligence. Fortunately, two of the studies reviewed have been used by the Force 2025 planners as evidence of air intelligence shortfalls and the basis for modernization efforts. The use of these studies indicates broad institutional support and acceptance of their findings that would otherwise only be 'the views of the author,' and not reflective of the official policy or position of the Service.

3.A. Alert and Ready: An Organizational Design Assessment of Marine Corps Intelligence

Between 2001 and 2011, the MCISRE developed a number of "ad hoc arrangements, practices, and organizations" to "meet evolving expeditionary force demands."[49] The DIRINT, in an attempt to better understand the ad hoc elements of the MCISRE and re-align it as required, "asked the RAND National Defense Research Institute to broadly review the organizational enterprise."[50] The result was *Alert and Ready: An Organizational Design Assessment of Marine Corps Intelligence*.

While intended to identify organizational issues in the MCISRE, the researchers collected data on a number of issues they identified as non-organizational, as well. Because of the short duration and broad nature of the study, the researchers offered no recommendations on issues identified as non-structural, but they did offer limited analysis of them. The authors of the study write, "We retained issues that were not strictly organizational because their identification may

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[49] Paul et al., iii.
[50] Ibid.

still be useful to the organization. We sorted the identified issues into two categories: structural and not structural."[51]

Key to RAND's methodology was their prioritization of these issues, scoring them to identify the impact of the issue. They describe their methodology for doing so:

> we first considered each issue against each objective [of Marine Corps intelligence] and then scored the issue as (1) a challenge that threatens the objective, (2) a risk factor that could adversely affect the meeting of the objective, (3) not adversely related to the objective and unlikely to become so even if conditions change, (4) not adversely related to the objective but at risk of becoming so if conditions change (trade-offs), or (5) not applicable, or unrelated to the objective. We then gave each of the five conditions a quantitative score: 1 = 0.5; 2 = 0.25; 3 = 0.05; 4 = 0.2; 5 = 0. These are ratio scores of the risk that the issue poses to a given objective.[52]

The study identified forty-eight issues, eighteen structural, and thirty non-structural. RAND described the second ranking issue, "Vicious cycle in aviation: intelligence not well prepared to support aviators; aviators view intelligence as irrelevant," with a "Threat/Risk Score" of 0.96.[53] By comparison, the highest score was 0.98, the third highest was 0.925, the average was 0.599, and the median was 0.603.

Given its short length, it is worth reproducing RAND's discussion of the issue in full:

> Several respondents reported issues with intelligence support for USMC [United States Marine Corps] aviation. The bottom-line consensus appears to be that intelligence officers are not pilots and thus face an uphill struggle for credibility and perceived value in the aviation community. For example,
>
> "Young aviation intel officers are not well prepared for or respected in the wings. They are thrown out to staff jobs too early in their career. They are given no way to relate to the pilots; they speak different languages."
>
> Compounding the difficulty of this cultural tension between intelligence personnel and aviators is the observation that "intel is viewed as irrelevant in the aviation community." What starts as a cultural mismatch then festers and gets worse:

[51] Ibid., 49.
[52] Ibid., 49-50.
[53] Ibid., 52.

> “It becomes a vicious cycle. Lack of respect for a young, underinformed aviation intel officer shows in mission reports, which leads to aviators blowing off debriefs, which impairs the intel officer’s ability to do the job, which prevents him from getting the information needed to paint the broader picture and show value.”
>
> This cycle is perpetuated by the fact that many aviation intelligence officers have bad experiences and leave the [Service] or the wing. Their replacements are often other young and underprepared aviation intelligence officers who do nothing to change aviators’ negative views of intelligence personnel, according to our interviewees.[54]

Because the report identified this issue as non-structural, it offered no recommendations for addressing it. However, I posit that the challenges implied by this short analysis are in fact at least partially structural—air intelligence officers lack operational credibility (presumably from a lack of training, experience, or context) and they do not understand unique aviation terms and lingo (another shortfall in training), resulting in a cultural aversion to fully accepting air intelligence officers as ‘members of the team.’ The limited analysis suggests this bad experience leads air intelligence officers to depart the wing or the Service, resulting in comparatively poorer leadership in the community at higher ranks. This, however, is not substantiated by any data included in the report. Other elements of this perception of irrelevance may be due to the lack of a serious air threat faced by Marine aviation in recent decades, although, again, the report does not elaborate.

In sum, as an issue identified as non-structural and therefore outside the scope of their study, the *Alert and Ready* researchers offered little in the way of recommendations to improve air intelligence. Despite this, the report’s value is threefold: it is one of few pieces of research and analysis that identifies shortfalls in air intelligence and rank the seriousness of the issue in the context of the broader MCISRE; it is one of the only serious (if brief) attempts by non-intelligence personnel to look at air intelligence; and its tentative conclusions regarding air

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[54] Ibid., 58.

intelligence were eventually accepted by the Service and used as one of the two foundational findings on which the air intelligence changes in Force 2025 were developed (ironically, providing a structural solution to a problem initially identified as non-structural).

3.B. Marine Corps Aviation Intelligence: A Doctrine, Organization, Training, Material, Leadership, Personnel, Facilities and Policy Analysis

Written as a U.S. Army Command and General Staff College thesis in 2015 by Major Joseph Freshour, "Marine Corps Aviation Intelligence: A Doctrine, Organization, Training, Material, Leadership, Personnel, Facilities and Policy Analysis" uses the Doctrine, Organization, Training, Materiel, Leadership and education, Personnel, Facilities, and Policy (DOTMLPF-P) framework to systematically analyze the adequacy of Marine air intelligence.[55]

DOTMLPF-P and its variants are frameworks to ensure all organizational variables are addressed when developing the capabilities that support Joint or Service concepts. Because there is neither a concept for intelligence support to the ACE nor well-articulated capability requirements to execute a concept, any DOTMLPF-P analysis to determine the adequacy of current capabilities must include a necessary level of subjectivity as it cannot analyze the organization's ability to execute a concept that does not exist. Major Freshour's methodology did not explicitly account for this, but he compensated for this shortfall in two ways. First, he developed metrics for each pillar of DOTMLPF-P (for example, organization was evaluated

[55] DOTMLPF&C is related to and often confused with the DOTMLPF-P framework. DOTMLPF-P is the joint framework used by a variety of development processes such as the Joint Capabilities Development process and the Joint Capabilities Integration and Development System. Chairman of the Joint Chiefs of Staff, *CJCSI 3010.02E Guidance for Developing and Implementing Joint Concepts* (Washington, D.C.: Chairman of the Joint Chiefs of Staff, August 17, 2016); Chairman of the Joint Chiefs of Staff, *CJCSI 3170.11 Joint Capabilities Integration and Development System* (Washington, D.C.: Chairman of the Joint Chiefs of Staff, January 23, 2015). DOTMLPF&C is the Service-specific version of this framework used by the Marine Corps. Conceptually, the two frameworks provide the same approach to ensuring all organizational categories are addressed for new capabilities or concepts and they are both used for similar purposes but they are associated with discrete processes. Because of their similarities in structure and purpose, it is not uncommon for the two to be confused or conflated.

"based on an organization's manning, fulfillment of official support requirements, and area of focus.").[56] Second, he validated data, analysis, and conclusions with leadership within the air intelligence community (including multiple MAG, MAW, and Marine Expeditionary Unit [MEU] S-2s, as well as the Marine Aviation Weapons and Tactics Squadron One [MAWTS-1] Intelligence Department). This reduces but does not eliminate the subjectivity of his findings. Nonetheless, the lack of a concept or articulated capabilities against which he could conduct this analysis is itself an indicator of air intelligence's inadequacy by his research's own standards.

Major Freshour finds deficiencies across the five elements of the framework his research was able to address (doctrine, organization, training, leadership, and personnel) and concludes that Marine air intelligence "[does] not adequately support Marine Corps aviation in its current and near-future operations."[57] The training deficiencies he identifies are relevant to this study.

Major Freshour introduces Marine aviation and its functions and briefly describes the threat posed by Russia and China to Marine aviation's ability to operate in the current and future operating environment. These are consistent with the future operating environment described by the strategic documents in Chapter 2. He then analyzed the five selected elements of DOTMLPF-P by his custom metrics. Within training, he identified eight areas for evaluation and analyzed each area's adequacy based "its aviation focus, its standardization with other training, and whether or not an evaluation process existed."[58] Before continuing, it is worth noting that the role of T&R manuals is to articulate training requirements across the Service. Thus, Major Freshour's analysis of eight areas is redundant. A more appropriate approach would have been to analyze the adequacy of the T&R manual itself (still a subjective endeavor without a concept on

[56] Freshour, 44.
[57] Ibid., iv.
[58] Ibid., 49.

which to base training requirements) and then to evaluate the *places* where training occurs on their fulfillment of the T&R manual's requirements. While he zeros in on the T&R manual as the common root of these training inadequacies, it would have been more correct if he identified all other seven areas as 'adequate' because the T&R manual identified no requirements for them (or, in the case of AIOC, the minimal requirement was being met). This conclusion would have not only been more accurate, but it might have been more impactful, highlighting the *severe* inadequacy of the T&R manual in identifying the training requirements Major Freshour clearly expected to find (in turn, caused by the lack of a concept).

While I agree with Major Freshour's general conclusion that the T&R manual is inadequate, the *precise* ways in which is falls short are central to this study's research question. It is therefore important to dissect his findings to better understand where his general conclusions are not fully-supported by his analysis.

He found the (2013) T&R manual inadequate and "unable to support aviation intelligence training and aviation operations. This was due to the T&R manual's lack of focus toward aviation intelligence, its vague training requirements, and its lack of evaluation requirements."[59] Of the twenty-six events to train an 0207 (the MOS for Air Intelligence Officer—then the only air intelligence MOS), "only one actually deals with aviation intelligence and it is incredibly vague," with no event requiring evaluation to determine if it was "performed to standards or even performed at all."[60]This is an unfair characterization, as all ground T&R events have nominal standards that require some form of evaluation. For example, the standard for the singular 0207-specific event in the 2013 manual is "Within the time limits established by the Commander and

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[59] Ibid., 50.
[60] Ibid., 51.

which meets mission requirements."[61] He is correct, however, that no event is E-coded, indicating that it would contribute to unit readiness metrics. In any event, E-coding is a mechanism of specious utility for support MOSs like intelligence. It would have been more accurate to say the event lacked any meaningful standard. Finally, he highlighted that the only Mission Essential Task List (METL) listed in the manual was for Intelligence Battalion, with none provided for any aviation unit.

Because of these deficiencies in the T&R manual, Major Freshour finds wing, group, and squadron intelligence training and readiness assessment criteria deficient as well (with any formal or standardized training non-existent). He cites Squadron Intelligence Training and Certification Course (SITCC—then run by 2d MAW and not yet formalized by United States Marine Corps Training and Education Command [TECOM]) as an informal, non-standard, partial solution to these deficiencies. However, as he correctly states, this "further highlights that the intelligence T&R manual does not adequately support aviation intelligence training and its support to aviation operations."[62]

He also found AIOC to be inadequate, due to a lack of standardization (which, while he did not state it, he presumably concluded from the deficiencies in the T&R manual, on which the AIOC Program of Instruction [POI] is based), the lack of Top Secret instruction (to include on F-35 capabilities), and the lack of a formal relationship between AIOC, MAWTS-1, and MCIA (this is arguably based on an incorrect understanding of MCIA's mission).[63] The disconnect between air intelligence organizations, he concludes, leads to a lack of standardization among

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[61] Commandant of the Marine Corps, *NAVMC 3500.100A Intelligence (Intel) Training and Readiness (T&R) Manual* (Washington, D.C.: Headquarters, United States Marine Corps, July 1, 2013), Enclosure (1), 11-22.

[62] Freshour, 52.

[63] Ibid.

organizations and the lack of a coherent vision for Marine air intelligence (an area where a concept for intelligence support to the ACE would contribute).

He also found MAGTF Intelligence Officers Course (MIOC—the captain's-level formal intelligence school to turn lieutenants from one of the four feeder MOSs into a generalist 0202) to be inadequate. As a course intended to provide lieutenants from a feeder MOS a broad understanding of MAGTF intelligence requirements and capabilities, its lack of adequate instruction on air intelligence (a singular class over a ten-week course) prevented it from achieving this goal, resulting in 0202s without an 0207 background feeling unprepared by MIOC when posted to aviation support billets.[64]

Major Freshour found MAWTS-1's Intelligence Department to be inadequate because it failed to adhere to three requirements in Marine Corps Order (MCO) 3500.109 Weapons and Tactics Training Program (WTTP): conduct periodic liaison with fleet units, "serve as the syllabus sponsor for all aviation T&R manuals," and assist in the development of Marine aviation doctrinal publications (normally as the proponent).[65] While Major Freshour is mistaken that the WTTP applies to air intelligence (discussed in more detail in Chapter 6), if he had accounted for this and only applied the same standards he applied to AIOC, he still would have found MAWTS-1's Intelligence Department inadequate.

Finally, he found VMFT-401's intelligence training inadequate. While VMFT-401 is not an intelligence organization, as the Service's sole adversary or aggressor squadron, it is required to "provide instruction to active and reserve fleet Marine forces and fleet squadrons through dissimilar adversary combat tactics training," a mission normally requiring intelligence support.

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[64] Ibid., 54.

[65] Ibid., 56. The syllabus sponsor, assigned by TECOM, is responsible for coordinating T&R changes. Commandant of the Marine Corps, *NAVMC 3500.14D Aviation Training and Readiness Program Manual* (Washington, D.C.: Headquarters, United States Marine Corps, February 05, 2016), 5-1.

He found VMFT-401 lacked any secure facilities in which to research or discuss classified adversary tactics and had inadequate intelligence structure (with only a single 0231—an all-source Intelligence Specialist—and no intelligence officer on its Table of Organization [T/O]).[66]

Ultimately, Major Freshour properly roots almost all these deficiencies in the T&R manual, from which, in practice and by design, all other standardized training in the Marine Corps flows. He concludes,

> The consequence of all this is that most of the intelligence organizations are operating on different agendas, none of which is formally linked to one another through the T&R manual or other formal agreements. This results in non-standardized training that is not required to be evaluated, across all of aviation intelligence. Some agencies are trying to correct this, but these efforts are driven by personalities, not by formal requirements. A lack of formal training, standardization, and evaluation has left a void that is being filled by the perceived best efforts and personality of each aviation intelligence agency.[67]

Major Freshour's recommendations to address these training shortfalls center around the creation of a "dedicated aviation intelligence T&R manual," based around supported units. Such a manual,

> should produce a mission essential task list and individual METs that are focused on aviation intelligence and that can provide guidance on the conduct of regular unit level training events from the squadron S-2 to the MAW G-2. These should be nested with the respective aviation T&R manuals so the training is integrated and is taking place in support of aviation operations training … [and] must require evaluation by both WTI graduates and WTI instructors. This will allow for standardization and evaluation by outside agencies and will promote a better level of understanding across the aviation intelligence community.[68]

He adds to this the recommendation that AIOC include instruction at the Top Secret level, to include the full capabilities of the F-35. As will be discussed in Chapter 6, with the exception of these training recommendations, nearly all of Major Freshour's other

[66] Freshour, 57.
[67] Ibid., 70.
[68] Ibid., 74-75.

recommendations (in doctrine, organization, leadership, and personnel) were generally adopted. Within training, only part of this latter recommendation was adopted, with AIOC including Top Secret instruction (though not on the full capabilities of the F-35) shortly after Major Freshour's thesis was published.

3.C. Marine Corps Intelligence Training and Readiness Information Management Systems: A Concept for Change

Written by Major Scott Reed in 2010 as a thesis for Marine Corps Command and Staff College, *Marine Corps Intelligence Training and Readiness Information Management Systems: A Concept for Change* addresses the inadequacy of the T&R reporting and information management process, concluding that it inhibits training, readiness, and interoperability.

Major Reed identifies that, more than fifteen years on from the Van Riper Plan,

> Though many of the root problems of the intelligence community were rectified, the information management processes used to direct training development, mentoring, and education as well as readiness reporting that feeds useful metrics to help manage the workforce, have remained virtually unchanged and have become more of a burden than an asset.[69]

The result, he concludes, is that units risk their intelligence Marines being unprepared or unable to fully perform their duties in combat. (Again, it is worth noting that Marine intelligence has never fully articulated what, exactly, those duties are.) "This worst case scenario," he explains, "has not happened on a significant scale due to the personality, experience, foresight, and determination of unit intelligence staffs and commanding officers," and the Service's luck in avoiding a peer- or near-peer conflict.[70]

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[69] Scott M. Reed, "Marine Corps Intelligence Training and Readiness Information Management Systems: A Concept for Change" (master's thesis, Marine Corps Command and Staff College, 2010), 1.

[70] Ibid., 2.

Major Reed's study begins by identifying a series of problems within the MCISRE. The challenges facing career progression and professionalization are not dissimilar from the training shortfalls identified by Major Freshour:

> Current manuals and orders pertaining to training and readiness are not tied to achievement of any type of certification, the absence of which would preclude performance of an intelligence analyst's duties, … they contain little specific direction and no imperative to make standard plans for individual career progression. Development beyond unit and pre-deployment training is most often left to the initiative of the individual and the mercy of the unit training schedule. … If individual career progression plans …. Are developed, there is no repository by which to make them accessible beyond the individual and supervisor, and no transparency that would allow senior community mentors or upper echelon planners to use those plans to help forecast training requirements.[71]

And while Major Reed states that the DIRINT "directed the initiation of an intelligence training and certification plan," nine years on, there is no evidence of it.[72]

The training manuals available at the time were focused on generic skills, "not designed to track special skills outside of normal MOS tasks," resulting in "the assignment of individuals by their primary MOS and grade to units or duty stations where [their] unique lessons and experiences atrophy or become obsolete."[73]

His recommendation is to establish a system whereby training manuals are relevant, responsive, and adaptable; "Updates must be effected rapidly … to address lessons identified over the course of exercises and combat operations."[74] He specifically recommends a Marine Sierra Hotel Aviation Readiness Program (M-SHARP)-like system with interoperability (both in the ability for the systems to interface but also in use of common categorization and terminology of trained skills) with the IC's Intelligence Community Capabilities Catalogue ("A subset of the

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[71] Ibid., 7-8.
[72] Ibid., 9.
[73] Ibid., 12.
[74] Ibid., 20.

IC Human Capital Repository … containing an inventory of IC employees according to their competencies and experience").[75] (M-SHARP is "the training management system for scheduling and logging [aviation and aviation ground] T&R Events, comparing logged data to [unit] readiness metrics, and formatting readiness data within [Aviation] T&R Program Manual guidance").[76]

While this research does not necessarily concur with Reed's recommendation for a system compliant with the IC's, his recognition and description of the problem is highly relevant to his research. The current T&R framework provides only generalist tasks and therefore there is no institutional ability to track a Marines' unique skills in providing intelligence support. While Marine Corps Training Information Management System (MCTIMS) now provides an ability to track individual T&R event completion for a Marine, the lack of training events that describe the requirements of a specific billet denies the ability to meaningfully track a Marine's training readiness to support a given unit in given billet.

3.D. Summary

The literature review revealed that despite being identified as a chronic and important problem in Marine intelligence, air intelligence itself is a little-studied area—air intelligence training, even less so.

The literature reviewed for this research nevertheless establishes that air intelligence is inadequate to meet the needs of Marine aviation, that the shortfalls predominantly are in training, and that the training frameworks currently in place require significant revision to adequately address deficiencies. The validity of findings in this literature review is supported by the

[75] Director of National Intelligence, *ICD 601: Competency Directories for the Intelligence Community Workforce* (Washington, D.C.: Office of the Director of National Intelligence, October 4, 2010), 2.

[76] Commandant of the Marine Corps, *NAVMC 3500.14D Aviation Training and Readiness Program Manual*, 1-3.

Service's explicit acceptance of them in the WISC Concept of Employment (CONEMP—see Chapter 6).

As highlighted in Major Freshour and Major Reed's theses, adequate training rests on sufficiently-defined training requirements. For intelligence, those requirements are arguably missing or incomplete. This is due, in part, to the lack of a concept for intelligence support (in Major Reed's argument, for Marine intelligence, generally; in Major Freshour's argument, for air intelligence, specifically). It is perhaps the lack of such a concept that has led both to the inadequacy of intelligence training as well as the challenge in studying or measuring it (with no concept to serve as yardstick). While this study focuses on training, such a focus is not possible without also acknowledging that a concept is sorely needed.

This literature review, then, established (and found no evidence to refute) the existence and importance of the problem as well as the fact that it has not yet been researched.

CHAPTER 4

RESEARCH METHODOLOGY

This research seeks to answer the following key question: how can the Marine Corps implement air intelligence training within the Force 2025 force structure such that it provides adequate intelligence support to Marine aviation in the future operating environment?

Key questions subordinate to the research questions include: What factors have enabled training reform to succeed? What factors have contributed to failed reform within air intelligence? And what changes are necessary to realize efficient and effective air intelligence training reform?

4.A. Author’s Expertise

A brief note about my expertise in this area is necessary to understand both the perspective of this research, its potential biases, and the reasonableness and feasibility of its conclusions and recommendations.

I was designated an 0207, attended AIOC in the summer of 2012, deployed to Afghanistan as the intelligence officer for an MV-22B squadron in 2013, and returned to be a MAG intelligence officer the same year. While at the MAG, I spent approximately six months attempting but ultimately failing to use the 2013 Intelligence T&R Manual as the foundation for a comprehensive unit-level training program (developing a program but concluding that the T&R manual was of limited utility as a guide to do so). In 2014, I attended the WTI course and was granted the 0277 MOS, returning to undergo a Pre-deployment Training Program (PTP) and deployment with a MEU ACE composite squadron (including MV-22Bs, AV-8Bs, CH-53Es, AH-1Ws, and UH-1Ys) from 2014-2015.

After returning from the MEU, I executed orders outside of the air wing but remained engaged in efforts to improve air intelligence. During this time, I was the principal author of the Service's first air intelligence doctrinal publication (to make it to publication) on behalf of MAWTS-1 (designated proponent for the publication), developed and chaired an air intelligence tradecraft standardization forum (the Air Intelligence Tactics Study Group [AITSG]) on behalf of I-Dept, worked with MAWTS-1, I-Dept, and TECOM to substantially revise formal course T&R events for 0207s and write initial formal course T&R events for the new 0271 MOS. I was also a significant contributor to the WISC CONEMP and discussions regarding WISC design and implementation.

This experience provides me a comparatively-intimate familiarity with the current changes underway throughout air intelligence as well as the debates that are and have been taking place among leaders within the Marine air intelligence community. It also provides me with significant personal insight and participation in recent air intelligence reform efforts as well as a personal stake in the outcome of such efforts. This unavoidably introduces potential for a degree of bias into the research and its findings that I will attempt to minimize by: making explicit to the reader where I have been personally involved in the issue at hand; conducting analysis on the objective facts or outcomes of a situation and weighing alternative perspectives; and filtering the second case study analysis through the CMM both on its own and in comparison to the first case study.

4.B. Justification for Data Collection and Analytic Methods

As the topic has been little-researched before and the variables affecting successful training reform are not known, a qualitative research design is most appropriate.[77] The bounding

[77] John W. Creswell, *Research Design: Qualitative, Quantitative, and Mixed Methods Approaches (Fourth Edition)* (Thousand Oaks, CA: SAGE Publications, Inc., 2014), 20.

of the research subject by time and activity makes case study the most appropriate qualitative technique. The unique characteristics of the topic, to include specific Service, time frame, current context in which the change must take place, the Service's force and training restructuring efforts, and the projected future operating environment mean that the topic cannot be easily tested with other methods. Nor will conclusions about Services' intelligence training or concerning different time frames or contexts have direct and immediate application to the unique parameters of the current situation of Marine air intelligence. The advantage of the case study design is that a customized answer to the question is desired in order to apply this research's findings to the current state.

The archival data collected for this research provides the basis for understanding the training history covered by both case studies. Primary source documentation (mostly authoritative orders or directives) form the basis for analysis. These sources are augmented by secondary source descriptions of primary sources not otherwise available (e.g., factual descriptions of existing orders, directives, or other publications not extant or discovered in archival research), and augmented by secondary sources that provide contemporaneous qualitative evaluations (e.g., professional journal articles) of the relevant training conditions and orders, directives, or other publications.

4.C. Case Study Design

This research identified two case studies relevant to the subject.

The first is a history of Marine aviation training, which provides a case study of successful training reform, which itself has served as the basis for Service-wide training reform for nearly twenty-five years. While the history of Marine aviation provides multiple examples of training reforms, each one attempted to solve a novel problem or address unanticipated or second-or third-order problems created by previously-implemented reforms. Furthermore, many of the reform efforts were complementary, taking place in a coherent reform strategy intended to affect the entire Service (from OPFOR to the supporting establishment, from the top echelons to the bottom). This indicates that Marine aviation training reform has been largely successful at solving identified problems and Marine aviation is a learning organization in a state of continued optimization, where issues are identified and adequately addressed. Analysis of this case study will attempt to identify factors that facilitated effective reform efforts.

The second case study covers the history of air intelligence and efforts to improve air intelligence training, which is a history of failed training reform. While air intelligence accomplished numerous incremental improvements that resulted in some measurable progress, these reform efforts are ultimately considered a failure due to the fact that subsequent reform efforts continued to address the same fundamental problem and that few, if any, were complementary or addressed more than a singular element of the air intelligence enterprise. This indicates that no reform efforts were successful in fully solving the problems identified and that air intelligence has not been a learning community. Instead, air intelligence has remained in a state of improvement paralysis where the same issues are repeatedly identified but never adequately addressed. Analysis of this case study will attempt to identify factors that inhibited effective reform efforts.

In addition to the primary purpose of this case study, the history of air intelligence has only ever been told partially and, generally, with little analysis. The general professional neglect of the subject, to include the lack of concepts, doctrinal publications, or effective training manuals, has resulted in a short (and sometimes inaccurate) institutional memory that has inhibited effective reform. Thus, by presenting a comprehensive history of Marine air intelligence, it is my hope that the case study will itself contribute to air intelligence training reform efforts by helping to improve institutional knowledge within the community, allowing it to more accurately estimate the fundamental nature of the problems it faces and therefore design more effective solutions.

By joining the analyses of these case studies, this research will attempt provide answers to the research question, develop specific recommendations for implementation, and identify other improvements to be considered at a future date.

I initially considered a third case study, investigating the United States Air Force's (USAF) approach to intelligence training. However, after initial research I determined that, because of the differences in Service structure and frameworks (i.e., the existence of multiple formal training schools, different training regulations and policies, and a different approach to designation of occupational specialties and skill tracking), significant interpretation of a USAF case study would be required to develop conclusions and recommendations for the Marine Corps. I also concluded that this third case study was not likely to provide unique conclusions beyond those already provided by the first two case studies.

4.C.1. Data Selection

The data selected for this study included the sources cited as the foundation for the WISC, Service professional journals, the Marine Corps Center for Lessons Learned (MCCLL), National Intelligence University and Service university theses, all documents available through Defense Technical Information Center (to include official reports, studies, manuals, and histories), and both active and cancelled Joint and Service orders, instructions, directives, notices, and other publications. Additional sources were found recursively from this primary data set, with any references or citations made within the primary data set as well as other publications by authors of primary data set documents, in turn investigated, until no new or relevant sources were discovered.

All searchable sources of information were interrogated for all variations on the relevant words (e.g., air/aviation/ACE, intel/intelligence/S-2/G-2, training/training and readiness/T&R/readiness/standardization). As legacy terms for relevant concepts were discovered, searches were re-run to discover any new documentation.

Data selection for the first case study is bounded by approximately 1960 through to the current day. Marine aviation training reform entered the current era of training with the adoption of the Level Ready Pilot Training Program around 1960s. The training of this era was fundamentally based on T&R manuals, ending the era of Phase Training. Thus, the adoption of the Level Ready Pilot Training Program serves as the beginning of the first case study.

Data selection for the second case study is bound by the end of World War II through to today. The Marine Corps began considering the theory of maneuver warfare in the 1980s. Prior to the adoption of this theory, Marine aviation was not considered a maneuver force and therefore, modern air intelligence (i.e., in support of a maneuver element) could not exist. This decade (through to today) generally bounds the second case study. However, as the mentions of air intelligence prior to the 1980s are limited, the second case study includes a brief discussion of Marine air intelligence dating back to its origins in World War II.

4.C.2. Capabilities Maturity Model

To structure analysis of the case studies, I used the CMM process improvement model to understand how and when an organization becomes a learning organization, gaining effectiveness and efficiency, and therefore becomes able to institute effective reforms.

CMM is similar to Six Sigma and other popular process improvement models. It has been adapted and tailored for various purposes since its creation. Originally designed for software development process improvement, it has applicability to military organizations by articulating the development of processes that effectively allow organizations to identify problems, develop and implement effective solutions to those problems, and iterate this process improvement program, resulting in a continuously optimizing organization.

The CMM stemmed from a September 1987 report from the Defense Science Board Task Force on Military Software. The report "addressed the managerial and technical changes needed to improve the software acquisition process within the DOD," and concluded, in part, that "today's major problems with military software development are not technical problems, but management problems. Hence we call for … major re-examination and change of attitudes, policies, and practices concerning software acquisition."[78] In response, Carnegie Mellon University's Software Engineering Institute, in conjunction with the MITRE Corporation, developed a process maturity framework. As it evolved, it became known as the CMM and its application has spread from software development to areas including business processes, education, and human resource management, to name a few. The model provides a strategy for process improvement program development that would provide "an evolutionary path that increases an organization's … process maturity in stages."[79]

The model describes five stages of process maturity (depicted in Figure 1):

> **1) Initial**. The software process is characterized as ad hoc, and occasionally even chaotic. Few processes are defined, and success depends on individual effort.
> **2) Repeatable**. Basic project management processes are established to track cost, schedule, and functionality. The necessary process discipline is in place to repeat

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[78] Defense Science Board, *Report of the Defense Science Board Task Force on Military Software* (Washington, D.C.: Office of the Undersecretary of Defense for Acquisitions, September 1987), i, 1.

[79] Mark C. Paulk et al., *CMU/SEI-93-TR-024; Capabilities Maturity Model for Software, Version 1.1* (Pittsburgh, PA: Software Engineering Institute, Carnegie Mellon University, February 1993), 5.

earlier successes on projects with similar applications.
3) Defined. The software process for both management and engineering activities is documented, standardized, and integrated into a standard software process for the organization. All projects use an approved, tailored version of the organization's standard software process for developing and maintaining software.
4) Managed. Detailed measures of the software process and product quality are collected. Both the software process and products are quantitatively understood and controlled.
5) Optimizing. Continuous process improvement is enabled by quantitative feedback from the process and from piloting innovative ideas and technologies.[80]

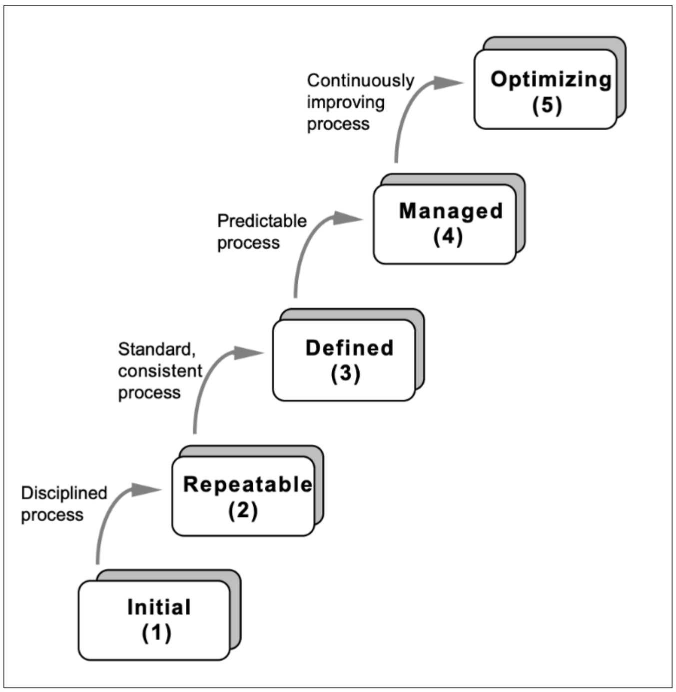

Figure 1. Capabilities Maturity Model. Mark C. Paulk et al., CMU/SEI-93-TR-024; Capabilities Maturity Model for Software, Version 1.1, 8.

Implied in this framework is the necessity to progress through stages sequentially or simultaneously (i.e., it is not possible to omit stages).

This model can be used to both describe the progress of Marine aviation training from the 1960s onwards and the lack of progress in Marine air intelligence training since the 1980s.

[80] Ibid., 8-9.

Ideally, a CMM analysis would be done at a single point in time with detailed data collection. While RAND's methodology did not apply the CMM to the MCISRE, the *Alert and Ready* study presents an ideal model for this sort of analysis: assessing a single snapshot in time and extensively surveying the entirety of the organization.

Given the scale and scope of both case studies, their long duration, and the fact that there are limited data points to reassemble a picture of the past, this presents only the ability to conduct analysis based on objective outcomes over time (i.e., changes or attempted changes that are documented or extant). While the CMM is about *processes* (to effect improvement), the processes are only important insofar as they result in improved outcomes. In this way, a CMM assessment of the case studies based on the observable outcomes (especially when many of those outcomes are the institution of new processes) is preferable.

Even this relies on subjective evaluation of those outcomes (e.g., concluding that flight leadership tracking was *improved* by the addition of Necessary Military Occupational Specialties [NMOS] to track the qualifications). The subjectivity of this evaluation can be mitigated with the assumptions that if: a process change increases optimization, the organization will sustain it; a process change reduces optimization, the organization will seek to change it; if a solution adequately addresses the problem, the problem will not be re-addressed; and if a change does not adequately address the problem, the change will be undone or more change will be sought to address the problem adequately. These assumptions may not be valid in some cases, but on the whole, it is reasonable to accept them.

As discussed in Chapter 3, without a foundational concept for intelligence support to Marine aviation, the evaluation of these outcomes (i.e., measuring if the processes are working) is limited by the lack of defined requirements that would be articulated by a concept. This research seeks to mitigate this analytic shortfall by extrapolating requirements from supported unit METs, which themselves are based on Service concepts and requirements.

4.C.3. Case Study Structure

The two case studies are structured differently based on their success in CMM progression.

Because Marine aviation successfully progressed along the CMM, its history is one of establishing a process improvement solution (e.g., training centers of excellence) that continues to adapt and provide value across the seven decades considered. This has resulted in a case study in which each of these optimization elements is explored in sequence.

Because Marine air intelligence has failed to progress along the CMM, its history is told almost strictly chronologically as problems are revisited time and time again.

Thus, while both case study structures are different based on different contexts, they nonetheless lend themselves to analysis within the CMM framework.

4.D. Validation

If the conclusions of this research are valid, it is expected that they will be immediately useful and implementable through: updates to the Intelligence T&R Manual with focus on individual and collective Managed On-The-Job Training (MOJT) events; formal utilization of 0277s as instructors, instructor trainers, and training program managers; and the addition of standardization and T&R implementation mechanisms in the OPFOR. These actions, indicating some degree of validity to research findings, will be observable directly through their implementation and indirectly through their briefing and acceptance at MCISRE governance activities such as the MCISRE Executive Steering Committee, Executive Steering Advisory Group (ESAG), and Operational Advisory Group (OAG) or to the DIRINT and I-Dept. While these changes are expected to result in the improvement of air intelligence training, this research is scoped to the current model of Service training and readiness. As such, optimal improvements may require substantial changes to the Service's approach to training and readiness (e.g., adjustment to unit-based rather than OccFld-based T&R manuals). This research does not address such questions but may identify them as areas for future research.

My active role in improving air intelligence has already provided an opportunity to validate some of the conclusions of research in this area (which has been underway formally since late 2018 and informally since early 2017), with elements of it incorporated into the current 0207 and 0271 formal course events, a draft WTTP re-write, as well as the WISC CONEMP. Because some of this validation of this research's conclusions was based on tentative conclusions, this research will go further in some areas to offer more detail or recommend modifications based on the full research findings.

CHAPTER 5

CASE STUDY 1: MARINE AVIATION TRAINING

"There are two primary and overpowering factors that affect a squadron's combat readiness. They are people and spare parts. ... With people and parts we'll have no readiness problem."[81] This is Lieutenant Colonel W. L. Traynor's optimistic assessment of the way to achieve aviation operational readiness in response to a proposal for standardization boards. It is significant for two reasons that help frame the evolutionary arc this case study presents.

The first reason is that, at the beginning of a radical and continuing shift in Marine aviation training and readiness, this was one of the rare arguments against change. Over the last seventy years, Marine aviation has debated what the next evolution in training and readiness improvement would be and the best way of accomplishing it. Along the way, few advocated for the status quo.

The second reason is that this is a lesson Marine aviation learned early on, but which air intelligence did not. Marine aviation would become a learning organization that, institutionally and over time, would work through such issues and move inexorably forward. Marine aviation systemically analyzed its problems, implemented defined processes designed to resolve the problem, established controls over the new processes, and ensured feedback that would continue to optimize the solution over time. In contrast, the history of air intelligence is, in some ways, one of throwing ranks, MOSs, and equipment at a problem in the hope that things get better. Where air intelligence achieved improvements, they were limited (often to entry-level training)

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[81] W. L. Traynor, "Not Another Board! Pilot Score Habit Of Hamstringing CO's Responsibilities," *Marine Corps Gazette*, February 1963, 52.

and failed to provide a systemic solution (e.g., across billets, MOJT in the fleet, publications, or Standard Operating Procedures [SOP]).

In this way, Lieutenant Colonel Traynor's article can be seen as a seventy-year-old fork in the road between Marine aviation and Marine air intelligence.

5.A. The Importance of Marine Aviation Training

The history of Marine aviation training is one of professionalization early and often. While regularly derided by non-aviation Marines throughout history as 'technicians' with the implication that they were somehow 'lesser warfighters,' Marine aviators have consistently had an eye not just on training and improving but on how to institutionalize, standardize, and professionalize training skills in order to best serve Navy, Marine and, later, Joint Force commanders.

Regardless of its cause, and despite the disdain which ground Marines often have for their aviator comrades, the Service continues to use Marine aviation training as the model, par excellence, to be followed in other fields: the Ground T&R Program was explicitly derived from and modeled after the Aviation T&R Program; Marine Corps Tactics and Operations Group, created in 2008, uses the Operations and Tactics Training Program (OTTP) to create Operations and Tactics Instructor (OTI) and Intelligence Tactics Instructors (ITI), a naked attempt to mirror MAWTS-1, the WTTP, and WTIs; and even today, as the Marine Corps brings online its cyberspace warfare capabilities, it speaks of the Marine Corps Cyberspace Warfare Group being the 'cyber MAWTS-1' and its Cyberspace Tactical Operations Center being staffed with 'cyber WTIs.'[82]

[82] Commandant of the Marine Corps, *MCO 3502.6A Marine Corps Force Generation Process* (Washington, D.C.: Headquarters, Untied States Marine Corps, June 7, 2013), 1, 3.

Thus, as much as any ground Marine may see a tour in the aviation community as ‘swinging with the wing,’ they owe their training framework to the hard work and determination of generations of Marine aviators and they continue to find broad cultural application and utility in Marine aviation training elements such as MAWTS-1 and the WTI.

As a consequence, the framework of Marine aviation training and readiness as well as the way in which it evolved have much to teach the rest of the Marine Corps about effective training models and are a natural place to start in analyzing effective approaches. This is especially true for ground MOSs and disciplines, such as air intelligence, that directly support and must integrate with this Marine aviation training ecosystem.

5.B. Pilot Training Progression: Phase Training and Level Ready Pilot Training Programs

Throughout World War II and into the Korean War, the United States’ military training model, generally, depended on industrial-scale training and readiness that was efficient and effective in converting large surges of new troops into trained and ready military units. However, such models strained the ability to sustain training and readiness during inter-war years. One of the first discussions of this challenge in aviation took place in 1961 after the benefits of 2d MAW’s Level Ready Pilot Training program became clear.

During the Korean War, as during World War II, Marine aviation found the need to create and train large numbers of aviators. In the mid-1950s,

> Orientation to fleet aircraft often consisted of a read of the handbook, a blindfolded cockpit check, a brief on how to start the engine, good wishes, and a pat on the back. More than one nugget was told something like, “Meet me over the field at ten thousand feet,” only to find that the rendezvous was the starting point for an air-to-air hassle to test the new guy’s skill and mettle.[83]

[83] Robert F. Dunn, *Gear Up, Mishaps Down* (Annapolis, MD: Naval Institute Press, 2017), 64.

Standardization and rigorous training on each platform were not then a major concern, either with respect to safety or a pilot's proficiency.

> After all, propeller-driven aircraft were so similar in cockpit configuration that an experienced pilot could easily step from one type to another without any special training, and many did so. … Every cockpit had a stick (or a yoke), a throttle (or two or four), prop and mixture control(s), magneto switches, perhaps a supercharger level, and flaps and landing gear controls. They were located in similar positions in every aircraft, and the only thing an experienced pilot needed to fly a new airplane was to know how to start it and the recommended airspeeds for maneuvers and landing.[84]

But with the introduction of jets, all this changed. More room was needed for takeoff, engine and throttle response was slower, fuel was consumed at a more rapid rate, and the higher speed of the aircraft gave pilots much less time to respond to any problems, especially on landing.[85] This led to what would today be considered an astronomical level of death and destruction: in 1954 alone, naval aviation lost 536 people (12.24% of naval aviators), 776 aircraft (17.72% of the fleet), in 2,213 major mishaps (50.54 mishaps per 100,000 flight hours), costing $215,941,667 (over two billion in today's dollars).[86] The training paradigm for military aviation needed a major overhaul.

Coupled with the pressures of transitioning a comparatively basic propeller-driven fleet of aircraft to high performance, technologically sophisticated jet aircraft, the Marine Corps adopted the Phase Training Program. This program was designed to take large tranches of graduates from flight school as well as experienced pilots transitioning to the new jet platforms, provide them basic training in their airframe, composite them into squadrons, and train those

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[84] Ibid., 65.

[85] Ibid.

[86] Ibid., 141. Dollar amounts given are from 1954, adjusted for inflation using the Consumer Price Index, this dollar amount would be approximately $2,015,779,337 in 2018 dollars, the last year for which Consumer Price Index numbers are available.

squadrons for combat so that they would be ready for deployment in World War II or the Korean War. The program did this in three phases:

> Phase I of the training cycle consisted of four to six months of basic flight training, which included familiarization, instruments, and navigation. Phase II consisted of six to eight months of advanced training, including ordnance delivery and gunnery. Phase III was the combat ready phase and consisted of participation in exercises and deployments, and continued practice in ordnance and gunnery.[87]

Phase Training allowed all pilots in a squadron to enter Phase I at the same level of readiness (none) and complete Phase III at the same level of readiness (combat ready). When swelling the ranks of the military to get on war footing and continuing to flow fresh replacement units into theater, such a program is ideal. But from 1954-1960, 2d MAW found the Phase Training Program ill-suited to its readiness needs for two main reasons.

First, 2d MAW maintained significant exercise and world-wide rotational deployment commitments without the commensurate force size of a nation at war. Because of this, 2d MAW found it necessary to task squadrons in Phase I or II with these collateral requirements, disrupting an entire phase of training for the whole unit. Second, the predication of the training program on an entire unit progressing through phases together meant "it was necessary in many instances to assign pilots to Phase I who had already completed an entire Phase Training Cycle," introducing inefficiencies by forcing qualified pilots to be retrained unnecessarily.[88]

Because of the declining operational readiness of its squadrons, 2d MAW designed an alternative training program that was better-suited to the maintenance of the steady-state when not engaged in a war and without large influxes of draftees, call-ups, and volunteers. What resulted was the Level Ready Pilot Training Program.

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[87] G. C. McClure, Jr., "The 2d MAW's: Level Ready Pilot Training," *Marine Corps Gazette*, March 1961, 33.

[88] Ibid., 34.

> The Level Readiness concept is based on the premise that one unit charged with responsibility for accomplishing a task can do a better job than several units trying to do the same thing. Accordingly, one squadron of each tactical type (all-weather fighter, fighter, and attack) is designated as a standardization squadron and is assigned the mission of training replacement pilots for all the other squadrons of this type.[89]

These training squadrons were given formal training and standardization designations and not made available for any operational requirements.[90] ('Level Ready' refers to the premise that this system would ensure all operational [i.e., not basic training] squadrons maintain level, instead of graduated, combat readiness at all times.)

The Level Ready Pilot Training Program had benefits beyond simple improvement in operational readiness. Under the Phase Training Program, twelve to fifteen squadrons might be in some stage of training at any time (i.e., not completed with Phase III), which "meant that although a syllabus was promulgated by AirFMFLant [Aircraft, Fleet Marine Force, Atlantic] as a guide in pilot training, there was a considerable difference of opinion among the squadrons as to how the syllabus actually should be applied."[91]

Additionally, because under the Phase Training Program, every squadron was a basic training squadron, there was limited ability to optimize the use of talented instructors across the MAW. Under the Level Ready Pilot Training Program, the most qualified and effective instructors were assigned to the basic training squadrons where their impact was multiplied across all the squadrons of the same aircraft type in the MAW. This also allowed aviators recently arrived from flight school to immediately begin their training syllabus and, upon completion, immediately be assigned to their receiving operational squadron (eliminating the wait to 'class up' with a new unit entering Phase I).[92]

[89] Ibid.
[90] Ibid., 35.
[91] Ibid., 34.
[92] Ibid., 35.

5.C. Training Centers of Excellence

While the Level Ready Pilot Training Program and the creation of Fleet Replacement Squadrons (FRS) were essential to the improvement of training fundamental aviation skills, Naval aviation had also developed the concept of a 'center of excellence' for the development and instruction of specialized or advanced skills. While these centers of excellence began with a relatively niche focus (nuclear weapons delivery), over the years Marine aviation realized the benefits they offered in acting as vehicles for quality control in training. They would eventually merge with the concept of standardization boards (which regularly assessed areas for procedural improvements and training progression, discussed later) and form into a single organization (MAWTS-1) to serve as the keeper of standards across the force.

5.C.1. Special Weapons Training Units

In the late 1940s, Marine aviators were first assigned to Navy Composite Squadrons (VC), flying the P2-V.[93] Used by the Navy and Marine Corps as a carrier-capable nuclear delivery aircraft, these squadrons had the mission of special (i.e., nuclear) weapons delivery. In 1950, with the introduction of more advanced nuclear-capable aircraft (the F2H-2B and the AD-4B) and better weapons technology, these squadrons began to develop new weapons delivery tactics.[94] In 1952, these Marines were reassigned to newly-created Special Weapons Delivery Units (SWDU), one on each coast, and by 1953 this mission was transferred to Marine attack squadrons and Special Weapons Training Units (SWTU) that were created (one on each coast) with the mission of providing the necessary training to all attack squadrons with special weapons

[93] C. L. Vermilyea and R. C. Kindsfater, "MAWTS-1: Aviation Training at Its Best," *Marine Corps Gazette*, May 1982, 54.

[94] Ibid.

delivery capability.[95] In 1960, Special Weapons Training Unit, Pacific, "on its own initiative, established and implemented a highly comprehensive and full-spectrum syllabus for tactical squadrons" in air-to-ground weapons delivery.[96] As the value of this standardized advanced training syllabus was recognized, the SWTUs formally expanded their mission in 1962 to conventional weapons delivery and were re-designated as Marine Air Weapons Training Units (MAWTU).[97]

Thus, the imperative to maintain a nuclear delivery capability birthed a lineage of specialized training units, the SWDUs, SWTUs, and MAWTUs. Although these early units focused exclusively on fighter/attack platforms and their tactics, they nonetheless served as centers of excellence focused on standardized advanced tactical training.

5.C.2. Marine Air Weapons Training Units and Evolving the Training and Readiness Manual

The MAWTUs' initial mission was to "[provide] all delivery and loading training for conventional, nuclear and biological/chemical air delivered weapons for both aircrews and ordnance personnel of squadrons having any or all of the above delivery or loading capabilities."[98] However, the Vietnam War's focus on conventional air-to-ground weapons drove the focus of the MAWTUs away from special weapons delivery.[99]

To carry out instruction and manage the dissemination of expertise, the MAWTUs assigned permanent integrees (or 'liaisons' in today's parlance) to each Tactical (Fighter and Attack) Aviation (TACAIR) squadron. These two weapons instructors deployed with the

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[95] Dewey F. Durnford, Jr. and Con D. Silard, Jr., "Aviation Training and Readiness." *Marine Corps Gazette*, August 1970, 20.
[96] Ibid.
[97] Ibid.
[98] Ibid.
[99] Vermilyea and Kindsfater, 55.

squadron and conducted “all formal schools that pilots from their assigned squadron attended.”[100] The MAWTUs also maintained regular liaison with advanced aviation schools and test and developmental organizations to ensure their instructors had the latest and best threat information, tactics, and countertactics.

However, even then, they found the need to instruct pilots in events not included or not adequately covered in T&R syllabi. With the introduction of the F-4 to the Marine Corps in the early 1960s, MAWTU training responsibility expanded to incorporate air-to-air tactics.[101] In the late 1960s, 2d MAW endorsed Marine Air Weapons Training Unit, Atlantic’s (MAWTULant) plan for an expansive air combat maneuvering (ACM) course to leverage the new fighter’s air-to-air capabilities.[102] The T&R Manual at the time (MCO P3500.8B, 16 September 1968) provided only eleven flight hours for ACM.[103] In addition to the inadequacy of so few flight hours for such an intensive skill, the effectiveness of this training was reduced by undue conservatism with respect to flying the F-4 to its full capacity. As a consequence, little emphasis was placed on the training and, when it occurred, little emphasis was placed on doing it well or realistically. To correct this, the MAWTULant ACM course would explore the limits of the F-4’s performance envelope, develop and improve tactics, and provide the necessary familiarity with the fundamentals of ACM for pilots to be somewhat better equipped if they found themselves in a ‘dog fight’ (as compared to the eleven flight hours provided them by the T&R syllabus).

The development of this ACM course highlighted a number of shortfalls in aviation T&R. First, while most pilots could gain a modicum of proficiency though such a course, most

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[100] Durnford, Jr. and Silard, Jr., “Aviation Training and Readiness,” *Marine Corps Gazette*, August 1970, 21.

[101] Vermilyea and Kindsfater, 54.

[102] Norman G. G. Kerr, “Air Combat Maneuvering,” *Marine Corps Gazette*, May 1969, 60.

[103] Ibid., 59.

pilots lacked sufficient experience to *instruct* ACM. Those ACM instructors at the MAWTULant course were mostly Marines who had graduated from the Fighter Weapons School (the USAF's advanced aviation weapons, tactics, and instructor course).[104] Second, this was non-standard training, not recognized by the service as a capability (and therefore, training) requirement. It was not found in the T&R Manual and it was therefore not mandatory except at the discretion of unit commanders who personally happened to see value in it. And yet, such skills were important to successfully execute one of the F-4's core missions: air-to-air combat.

Thus, Marine aviation faced the problem of how to develop necessary training that did not exist, how to develop qualified instructors to teach and evaluate it, how to standardize it, and how to document and institutionalize it so that it would be available to pilots in the future. Key to this process would be the MAWTUs, where highly skilled and qualified instructors both had the mission and the support to identify such shortfalls, develop the necessary training syllabi, implement it, and refine it.

MAWTUs also relied upon a certain degree of luck for personnel assignment. MAWTU instructors, during the course of their schools and deployments, would identify prospective new instructors and recruit them from TACAIR squadrons. But even after this informal recruitment, screening, and interview process, a request for that individual would still have to be sent to Headquarters, United States Marine Corps (HQMC) for assignment. There existed no agreement or process in place to ensure that when the best and most qualified instructors were identified, they would receive the requested orders.[105]

[104] Ibid., 60.

[105] Durnford, Jr. and Silard, Jr., "Aviation Training and Readiness." *Marine Corps Gazette*, August 1970, 20.

The MAWTUs also relied heavily on command emphasis and interest for utilization. Contemporaneous observers note that in May 1967 not a single pilot within MAG-31 had attended a MAWTU school in eighteen months but, after a new MAG commander took interest in the MAWTU program, more than 200 pilots from MAG-31 attended MAWTU schools within six months.[106] The MAWTUs provided valuable but discretionary training—there was no training essential for TACAIR squadrons to achieve or demonstrate operational readiness that required the MAWTUs or their instructors.

To address this, during the 1968 T&R conference, attendees agreed to formalize the MAWTU's role in T&R by requiring "all aircrews to attend the MAWTUs … in conjunction with the T&R Manual Phase Training and follow-on training subsequent to syllabus completion."[107] This requirement, however, highlighted the need to standardize the syllabi taught at the MAWTUs.

In the late 1960s and early 1970s, MAWTULant and Marine Air Weapons Training Unit, Pacific (MAWTUPac) began holding standardization conferences to ensure Service-wide commonality of training (and therefore Service-wide commonality of capability). It was during these conferences that initial discussions arose about consolidating the two units. "However, Marine aviation reorganization efforts following the Vietnam era, coupled with the introduction of many new weapons and weapons systems, resulted in a temporary 'tabling' of the consolidation issue since the MAWTUs were heavily committed to local training efforts."[108]

[106] Ibid., 22.
[107] Ibid.
[108] Vermilyea and Kindsfater, 55.

5.C.3. Marine Aviation Readiness Study: Project 19

Marine aviation readiness issues continued, however. Not just in the area of training but in supply and maintenance as well. As a result, "In July 1973, the Commandant of the Marine Corps directed the Plans and Operations Department of the Aviation Division to conduct a special study of aviation readiness … to pinpoint the most serious problems confronting Marine Corps Aviation and institute measures to solve the problems."[109] The initial charter of the Marine Aviation Readiness Study called for it to be completed in three months with the envisioned output being "a thesis or essay like document which would analyze problem areas and make recommendations for solution of the problems."[110] But as it identified singular issues in one area or type of aircraft, it discovered that the same or similar problems existed across the Marine aviation community. Those conducting the study realized that a patchwork solution would fail to address the source of the problems. Instead, they shifted to developing a coherent and comprehensive strategy to address Marine aviation readiness, expanding the study in scope and duration.

By the end of August 1974, after the study group had visited most Marine aviation installations, conducted extensive interviews, and collected large volumes of data, Headquarters, United States Marine Corps, Deputy Chief of Staff for Aviation (DC/S Aviation) directed that the study's recommendations should be carved off into projects and assigned to responsible branches within Headquarters, United States Marine Corps, Aviation Division (DivAv), who would begin developing and implementing solutions "through coordinated staff action at the HQMC level."[111] The vehicle for this was called the Aviation Readiness General Project

[109] John V. Cox, "Marine Aviation Readiness Study," *Marine Corps Gazette*, May 1975, 37.
[110] Ibid., 37-38.
[111] Ibid., 38.

(ARGP), "a single sheet memorandum on which a problem was identified and a conceptual framework for solution of the problem was offered. … The first ARGP was signed out on 20 September 1974, and the last on 5 November 1974."[112]

The study produced twenty-one ARGPs. Project nineteen was:

> *Marine air weapons training units (MAWTU):* The two MAWTU's have provided outstanding service to the Marine Corps for a number of years. However, with the ever increasing requirement for technical weapons training excellence demanded by contemporary air warfare, it is necessary to re-examine the MAWTU mission for present and future adequacy. This is a long range project that is intended to ensure that the future needs of the Marine Corps will be met in aviation weapons training. Possibilities are consolidation, use of MAWTU's in ORI [Operational Readiness Inspection]/Training and Readiness Evaluation/Competitive Exercise situations, tactical [Electronic Countermeasure] training and establishment of a squadron weapons training officer course.[113]

Project twenty was:

> *Establishment of a squadron air weapons and tactics training officer specialty:* A long standing requirement in Marine Aviation has been the need to train, designate and properly use a sufficient number of tactical air weapon employment officers for use at the squadron level. These officers would be the squadron authority in weapon employment and tactics, and would be responsible for administering the unit's weapon training programs on a continuing basis. The squadron air weapon and tactics training officer would develop and maintain unit aircrew skills in the effective use of all organic aircraft weapons and tactics. Some groundwork has been accomplished in regard to assigning an MOS and identifying billets in T/O's, but the major problem is how to get these officers trained. MAWTU's are a possibility for the training.[114]

In the end, both of these projects would be addressed with the creation of MAWTS-1, which would carry forth and broaden the mission of the MAWTUs while providing the training venue for 7577 WTIs who, through the WTTP, would administer unit training programs.

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[112] Ibid., 39.
[113] Ibid., 42.
[114] Ibid.

To some, the study made clear that re-examination of the MAWTU mission did not go far enough: "It did not include all the aviation communities and [included] none of the aviation ground communities. The study also determined that the concept would function more efficiently and effectively if the units were consolidated at some location to form one unit."[115] A group of aviators who strongly concurred with this view hosted a conference to brief the idea and discuss options for implementation. Their proposal was met with significant resistance, primarily from TACAIR communities that felt the inclusion of all elements of aviation would 'water down' the fighter training currently offered by the MAWTUs. When the conference failed to come to any agreement, advocates for a consolidated MAWTU falsified the official conference documentation to state that all were in agreement with the concept for MAWTS-1.[116] This was enough for approval to test it out.

The WTTP, signed on 5 May 1976, established the WTI course and took the first steps towards addressing projects nineteen and twenty.[117] "In late 1976 and early 1977, WTI courses were taught independently by MAWTULant (WTI 1-76) and MAWTUPac (WTI 1-77). Consolidated WTI courses (WTI 2-77 and 1-78) were conducted at Marine Corps Air Station (MCAS) Yuma by a combined MAWTU staff in the summer of 1977 and again in early 1978."[118] The success of the consolidated courses broke down any remaining barriers to the consolidation of the MAWTUs into MAWTS-1.

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115 Vermilyea and Kindsfater, 55.

116 MAWTS-1. "MAWTS-1 40th Anniversary Video". Filmed May 2018. YouTube video, 20:31. Posted June 2018. https://www.youtube.com/watch?v=zh2HHgs-DFk.

117 Commandant of the Marine Corps, *MCO 3500.109 Marine Corps Aviation Weapons and Tactics Training Program* (Washington, D.C.: Headquarters, United States Marine Corps, January 16, 2007), 1.

118 Vermilyea and Kindsfater, 55.

5.C.4. Marine Aviation Weapons and Tactics Squadron One

After the success of these first WTI classes, MAWTS-1 was created on 1 June 1978 with the primary mission of implementing the WTTP and to

> provide standardized advanced tactical training and certification of unit instructor qualifications that support Marine Aviation Training and Readiness (T&R). MAWTS-1 accomplishes this by conducting the twice-annual Weapons and Tactics Course … as well as Supplementary Course of Instruction as directed … MAWTS-1 also provides assistance in the development and employment of aviation weapons and tactics.[119]

The WTTP requires unit commanders to ensure a training program, managed by a 7577 WTI, is "conducted that supports the unit's Mission, Mission Essential Task List and T&R syllabus."[120]

The WTTP evolved the tri-phase approach to Marine aviation training:

> The first level stresses individual training for competence in military occupational specialties. This level includes formal schools, naval flight training, and Marine replacement aircrew training squadrons. The second level stresses unit training and is designed to bring all naval aviators (NA), naval flight officers (NFO), and naval aerial observers (NAO) to combat-qualified status. This training ultimately involves the individuals and the unit in complex integrated exercises designed to closely approximate combat. [The Aviation T&R Manual and the Marine Corps Command and Control System Training and Qualification Manual] outline the training to be accomplished at the first two levels. The third level of training is designed to develop instructors and specialists who can teach, plan, and execute the second level training. Included in the third level are the WTI course and other supplementary instructor courses developed by MAWTS-1.[121]

Figure 2 depicts how these three levels interrelate and integrate the foundation of training and readiness: the Naval Air Training and Operating Procedures Standardization manual (NATOPS), the T&R manual, the WTTP, and mission performance standards. (The figure erroneously labels "Level III" as "Level II.")

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[119] Commandant of the Marine Corps, *MCO 3500.109 Marine Corps Aviation Weapons and Tactics Training Program*, 1.

[120] Ibid., 6.

[121] Vermilyea and Kindsfater, 55-56.

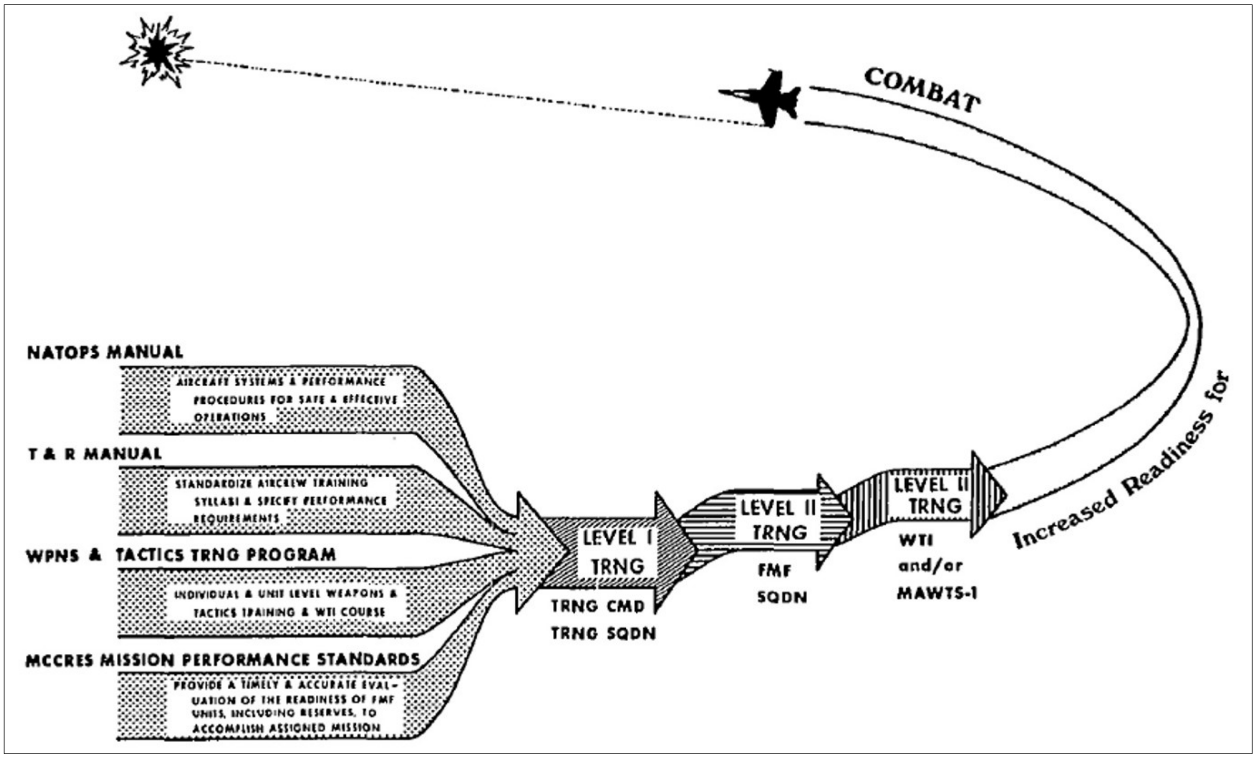

Figure 2. Three-Level Approach to Aviation Training. C. L. Vermilyea, and R. C. Kindsfater, "MAWTS-1: Aviation Training at Its Best," 56.

The WTI course itself takes place in two phases: academics and flight phase. Academics progresses through a 'generics' block that includes all student MOSs, into a 'commons' block where each aviation or aviation ground community receives instruction tailored to their platform or function, and finally into a 'specifics' block where more advanced community-specific topics are taught.[122] Flight phase progresses in the opposite direction, beginning with operations specific to a platform or function, to commons, where multiple similar platforms or functions are combined into more complex and sophisticated scenarios, and finally to a generics block where all elements of Marine aviation and the MAGTF are combined into a large, integrated final exercise.[123]

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[122] Walter L. Niblock et al., "MAWTS-1 and the WTI," *Marine Corps Gazette*, December 1996, 19.
[123] Ibid.

MAWTS-1's mission goes well beyond the WTI course. The unit maintains dozens of additional courses of instruction that support the creation of unit instructors as well as the courses of instruction those unit instructors use to instruct and evaluate T&R syllabus events.[124] MAWTS-1 is also responsible for fleet support (to provide instruction and oversight to OPFOR training programs), standardization, and tactics development (for communities subject to the Aviation T&R Program).

5.D. Training and Readiness Manual Development

Throughout the 1960s and 1970s, the lessons the Marine aviation community was learning in the utilization of the SWTUs, MAWTUs, and MAWTS-1 were being written into the first T&R manuals. A thorough evaluation of aviation T&R manuals is beyond the scope of this research. However, the origins of the T&R manual and today's Aviation T&R Program Manual provide the historical context to see how Marine aviation solved many of the challenges faced in training and standardization from the Korean War to today.

5.D.1. The Origins of the Aviation Training and Readiness Program

The same time as 2d MAW was developing and implementing the Level Ready Pilot Training Program, AirFMFLant and Aircraft, Fleet Marine Force, Pacific (AirFMFPac—the two primary Marine aviation commands on each coast at the time) had published MAW-specific T&R manuals to guide pilot training. As 2d MAW discovered while designing and implementing their Level Ready Pilot Training Program, however, there was significant difference in interpretation as to how these training programs would progress, not just between the two coasts, but even between squadrons in the same group. This manifested itself in the two T&R manuals' "training requirements, pilot qualifications, and procedures [being] sometimes miles apart."[125]

[124] Vermilyea and Kindsfater, 58-59.
[125] G. C. McClure, Jr., "One Book for Aviation," *Marine Corps Gazette*, April 1961, 60.

An East coast pilot might complete all career training progression requirements on one coast, achieving the ultimate training qualification, flight leader, and "then [arrive] on the West coast in an AirFMFPac squadron and [find] that according to its T&R Manual he is barely qualified to fly solo."[126]

Furthermore, Marine aviators were discovering that a consolidated T&R manual was required not just to provide common training across Marine aviation units, but also because Marine aviation units were subject to Naval aviation guidance and publications that, as these directives proliferated, needed to be incorporated into Marine aviation training. A common manual, then, would simplify the process of incorporating these requirements into Marine aviation training by providing a single document to be maintained and updated. It would also facilitate the dissemination and incorporation of best practices, the most current techniques, and standards. And finally, common training would eliminate unnecessarily redundant training as a pilot transitioned from one unit to the next and ensure a level of predictability in operational capabilities for ACEs compositing with various other Major Subordinate Elements (MSE) into MAGTFs for deployment.

The first voice to publicly call for this common T&R Manual, Lieutenant Colonel G. C. McClure, identified the proposal's central problem: who would be responsible? He suggested that DivAv, the aviation division of HQMC (now Headquarters, United States Marine Corps, Aviation [HQMC AVN]), or Marine Corps Schools at Quantico might be the "central agency" responsible.[127] He was searching for a central, responsible entity to not only maintain the common T&R manual but to serve as the locus for collecting or developing improvements to the manual, ensuring it remained a useful, relevant, and living document. While it was still seventeen

[126] Ibid.
[127] Ibid.

years off, Lieutenant Colonel McClure was hitting upon the ‘center of excellence’ concept that would evolve into MAWTS-1 (which would become the yardstick for centers of excellence across the Marine Corps).

By January 1962, DivAv planners had accepted Lieutenant Colonel McClure’s recommendations and had begun working towards a T&R manual that would be standardized across the Service.[128] The manual would provide a common syllabus framework of three phases (echoing the phases of the Phase Training Program, but applied to individual training progression in the manner of Level Ready Pilot Training):

> Phase I—Familiarization. Includes basic checkout, night flying, instruments, navigation, basic tactics.
> Phase II—Minimum proficiency in primary weapons and combat tactics to a degree that squadron would be minimum combat capable (shore-based), able to employ its primary weapons.
> Phase III—Special training in advanced or secondary weapons, carrier qualifications, special weapons, more training in basic weapons to achieve optimum combat effectiveness.[129]

This combined manual was finally published in early 1967.[130]

5.D.2. Training to Standards

In some areas, these first efforts fell short. While Marine aviation finally had a common Service T&R manual, as late as 1970 it still lacked the necessary standards to provide accurate and realistic assessments of readiness. Even the second edition of the manual (MCO P3500.8B), published in September 1968, failed to establish “performance or qualification criteria,” provided no mechanism for feedback from units training under the manual, and did not change readiness reporting for units to reflect their ability to accomplish their mission. “It is possible, and has

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[128] Anonymous, “One Book for Aviation,” *Marine Corps Gazette*, February 1962, 6.
[129] Ibid.
[130] Dewey F. Durnford, Jr. and Con D. Silard, Jr., “Aviation Training and Readiness.” *Marine Corps Gazette*, May 1970, 36.

occurred, for an A-4 squadron to report as combat ready in conventional weapons delivery when, in fact, less than half the pilots consistently hit within 200 feet of the target with freefall bombs" (the standard for freefall bomb delivery).[131] Thus, despite the forward progress, T&R reformers thought it "high time someone take careful aim at the bogus T&R posture of Marine Corps Aviation and the infantry-oriented inspection system."[132]

The performance criteria set forth in the manual was based on Combat Readiness Percentage (CRP), which was then calculated on the basis of how many training sorties were flown, not taking into consideration how effectively the aviator accomplished the mission.[133] Thus, CRP answered the question 'did you do it?' not 'did you do it well?' "For example, no Circular Error Probable (CEP) is set as criteria for qualification in any of the attack phases of the training syllabi. For that matter, no qualification measurement exists in any of the other areas of aircrew training syllabi."[134]

Additionally, the T&R manual and readiness reporting provided limited feedback mechanism to see where squadrons stood with respect to readiness or where the current T&R manual's provisions unnecessarily complicated or slowed the achievement of required readiness. Marine aviation at the time had

> only a CNO [Chief of Naval Operations] utilization factor establishing a flight hours per month standard for each type [of] aircraft. Flight hours tell us only that an aircraft became airborne and landed. No single, effective management tool is available to depict what, if anything, was accomplished by a given flight. More significantly, no measure at all is available relating to the squadron's efficiency in producing training as measured against flights flown.[135]

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[131] Ibid., 35.

[132] H. C. Ivy and D. G. Vest, "In Defense of the MAWTU," *Marine Corps Gazette*, October 1970, 50.

[133] Durnford, Jr. and Silard, Jr., "Aviation Training and Readiness." *Marine Corps Gazette*, May 1970, 36.

[134] Ibid. CEP is the measure of a weapon system's precision. In this use, CEP refers to the precision of the aviator delivering the ordnance.

[135] Fred Lacey, "Measuring Aircraft Utilization," *Marine Corps Gazette*, May 1970, 62.

As a result, “some squadrons were devoting less than 15% of flights to syllabus training,” which is to say only one in seven flights was resulting in meaningful T&R progression.[136] And because there was no way to regularly measure flight utilization against T&R requirements, it was impossible for higher headquarters to tell why this was. (The limited utility of T&R manuals was perpetuated by a degree of “apathy” among operational commands in sending “marginally qualified personnel” to T&R conferences where they failed to provide input of value.)[137]

The readiness reporting standards provided by the T&R manual were also decoupled from the essential output it nominally sought to achieve: readiness to be employed in combat. For example, theater contingency plans used CEP computations that, based on a unit’s aggregate CEP, would calculate how many sorties and how much ordnance would be required to attack the targets assigned to that unit. Without these figures (which were not measured by the T&R manual and thus available for higher headquarters planners) “neither planners nor programmers are capable of accurately determining weapons or sortie requirements for attack aircraft or to justify numbers of attack aircraft for any given wartime or contingency situation.”[138]

Again, there were calls for a center of excellence. These reformers called for the creation of a “Training and Readiness Branch” within DC/S Aviation (now HQMC AVN) that would be charged with “continual improvement and updating of training requirements” or for the MAWTUs to manage the aviation T&R.[139] They also called for “a master data file [to be] created for each aircrewman” that contained “a complete resumé of readiness, including progress through syllabus training, combat readiness and special qualifications by aircraft type and in

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136 Ibid.
137 Durnford, Jr. and Silard, Jr., “Aviation Training and Readiness.” *Marine Corps Gazette*, May 1970, 37.
138 Ibid.
139 Ibid. Durnford, Jr. and Silard, Jr., “Aviation Training and Readiness.” *Marine Corps Gazette*, August 1970, 19.

general aviation, schools attended and weapons delivery proficiency."[140] This tracking of T&R completion, on an individual basis, combined with the call for performance standards associated with each event (and the ability to track them), would also provide Marine aviation with a reasonable frequency with which a T&R event should be re-flown to maintain proficiency.[141] (As late as 1972, there were T&R events that, once proficiency was achieved, required no clear re-qualification or demonstration of maintained proficiency.)[142]

As it stood in 1970, however, readiness inspections were 'infantry oriented,' reporting on the unit's management of "basic training, log books/master logs, [Nuclear, Biological, and Chemical Defense training] and submission of reports. The functions of pilot training, weapons effectiveness, mission effectiveness and combat capability [were] not mentioned."[143] Readiness metrics did not take into consideration the T&R manual nor any measurement of the mission effectiveness of an aviation unit. T&R reformers called for "The criteria for inspection [to] be based upon the Training and Readiness (T&R) Manual, which would set forth governing criteria for accomplishment of mission training."[144]

Another shortfall in the first implementation of the Aviation T&R Manual was its failure to recognize there was something special required of instructors. "It's true that the reading material, the references, are available. However, without the expert to apply this knowledge to the everyday T&R functions, we go through the motions without efficiently managing or utilizing our assets."[145] The right information being available, then, is not adequate for instruction, let alone for making the 'fleet average' pilot an effective instructor of that material.

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[140] Lacey, 62.
[141] Ibid., 63.
[142] R. J. Deichl, "Improving our fighter pilots," *Marine Corps Gazette*, October 1972, 53.
[143] Durnford, Jr. and Silard, Jr., "Aviation Training and Readiness." *Marine Corps Gazette*, August 1970, 27.
[144] Ibid., 29.
[145] Ibid., 24.

One observer wrote that "the professionalism that existed in the attack squadrons was solely self-generated" and if it was to be made repeatable, Marine aviation needed a framework and the right processes to ensure the best and most qualified instructors were created, sent to a center of excellence to oversee fleet-wide training, and had the appropriate insight and enforcement mechanisms to ensure training across the Service was being conducted to standard.[146]

The seeds of a solution already existed. In the early 1960s, nuclear weapons delivery directives (forerunners to tactics manuals) mandated the creation of a Weapons Training Officer billet in A-4 Skyhawk squadrons.[147] These positions were staffed with the most experienced special weapons delivery pilots who maintained "Special Weapons Score Books" and "Pilot Weapons Training Folders." This billet and these individual training jackets did not exist in squadrons that did not have the nuclear weapons delivery mission and did not cover proficiency in conventional weapons delivery. The closest approximation was the "Weapons Employment Officer" at the MAG or MAW, a collateral billet for "short timers" in whose work commands took little interest.[148] With time, however, these seeds would grow into the Aircrew Performance Record, the 7577 WTI, and the WTTP.

5.D.2.A. Who Trains the Trainers?

The mere creation of MAWTS-1 did not solve all of Marine aviation's instructor problems. Nearly ten years on, in 1987, one observer wrote:

> Depending on the type of aircraft selected, the new Marine aviator will go to any of 11 different training squadrons at 8 different bases, located in 5 separate states, and run by 3 different Services. Two Marines slated to train in the same aircraft type won't necessarily go to the same training squadron. Some training squadrons will graduate their students at

[146] Ibid., 25.
[147] Ibid., 24.
[148] Ibid., 24.

> 60 percent combat readiness percentage (CRP), others at 70 percent. Some will place heavy emphasis on tactics, others won't. Some will waive or simulate required syllabus hops, others won't. Some have access to simulators, others don't.[149]

In 1990, this issue was again raised, this time by Major Robert Curtis. Requirements in the T&R manual "[require] an evaluation flight at the end of each series to ensure the student has met the training goals of that series," but "'Who trains the trainers?' The answer is: usually fellow squadron pilots with little more experience themselves than the student and no qualifications to teach or evaluate."[150] This problem dated back at least as far as 1962, when one observer asked, rhetorically, "How often are the [ORI] inspectors current in the type of aircraft flown by the squadron being inspected? How often are the people inspecting a [Marine Air Control Squadron] proficient in air-intercept control procedures?"[151] Because of a lack of rigor in the instructor framework (for 7577 WTIs, unit instructors, and FRS instructors), Marine aviation lacked a critical method of quality control. The end result was "the Marine Corps [allowing] the squadrons to evaluate themselves."[152]

> Consider a mountain area landing (MAL) flight. An aircraft commander (HAC) with 600 hours is in the right seat of a CH-46, and a copilot (H2P) with 400 hours is in the left seat. They complete their 1.5 hour flight in the hills of northern Georgia, and on return the HAC writes off the H2P for a day MAL. He also updates his own MAL flight. Without further training the copilot can carry troops into mountain landing zones. The HAC, freshly updated in MALs, can sign for an aircraft on the same mission.
>
> The only problem with this scenario is that the HAC in question may have had only one mountain landing himself. If a previous CO [Commanding Officer] waived his MAL flight in his original syllabus, he may have never done a MAL. He may never have had the intricacies of mountain operations—a difficult evolution at best—explained to him at all. Even if he has had thorough MAL training with ground school, multiple landings,

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149 Jeffery L. Kreinbring, "We Need An Aviation Training Center," *Marine Corps Gazette*, May 1987, 42-43.

150 Robert F. Curtis, "Who Trains the Trainers?," *Marine Corps Gazette*, May 1990, 77.

151 J. C. Brown, "Realism Needed In ORIs, Too; Vitalized Inspections Are The Key," *Marine Corps Gazette*, July 1962, 53.

152 Robert F. Curtis, "Who Trains the Trainers II?," *Marine Corps Gazette*, December 1993, 51.

> small zones, and bad winds, he has had no training in how to instruct, how to communicate knowledge to another aviator, or how to evaluate his progress.[153]

At the time, in 1990, not even 7577 WTIs received formal training on instruction techniques.[154] And as late as 2006, only AV-8B and MV-22B basic training squadrons had any instructor training courses that "[present] psychology of learning and teaching material at any level when developing [their instructor pilots]."[155] While Major Curtis's arguments that the lack of formal instructor training can be directly tied to the Service's mishap rate were rejected by a series of responses, these responses all rested their defense of that status quo (i.e., no institutional quality control measures on instructors) on both the commander's ability to use his or her judgement in designating instructors and by invoking the problem of infinite regression (e.g., who trains the trainers of the trainers?) as a reason for not instituting further quality control on the process.[156] As was seen with the necessitation of the WTTP and MAWTS-1, reliance on 'command interest' rarely resolves institutional problems. And the success of MAWTS-1 has demonstrated that who trains the instructor trainers (i.e., the 7577 WTI), while a valid question, is not an effective counter-argument and such layers of quality control can indeed result in additional degrees of quality assurance.

MCO 3710.6 Marine Corps Aviation Training System, signed in 2008, improved upon this quality control by establishing the Aviation Training System (ATS) with a mission "to develop a completely integrated training system across all of Marine Aviation that links training cost with readiness in order to provide the Marine Air Ground Task Force (MAGTF) commander

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[153] Curtis, "Who Trains the Trainers?," 77-78.
[154] Ibid., 78.
[155] Brent C. Reiffer, "Marine Aviation Instructor Pilot: Coach of Umpire?," *Marine Corps Gazette*, December 2006, 26.
[156] David S. Libby, "Training the Trainers, Part III," *Marine Corps Gazette*, March 1994; Paul S. Cariker, "Aviation Instructor Quality," *Marine Corps Gazette*, March 1994; Danny J. McDaniel, "Commanders Make the Difference," *Marine Corps Gazette*, March 1994.

with combat ready units."[157] Its primary purpose at the time was to provide proper management of the increasingly complex, capable, and numerous simulators and simulation facilities and to improve the ability of Marine aviation to maximize the use of simulators while retaining the realism of training essential to operational readiness.[158] But as the ATS was introduced, it provided a venue for increased standardization of training taking place at operational squadrons. It did this through Marine Aviation Training System Sites (MATSS) at each air station to carry out the ATS mission under the authority of the respective MAW. The MATSSs were home to the Flight Leadership Standardization Evaluators (FLSE) and the Flight Leadership Program and provided "the structure and requirements necessary for standardized training, development, and designation of flight leaders."[159] Thus, the ATS, though the MATSS, offered another degree of quality control for the WTTP and the Aviation T&R Program.

In 2016, this standardization (and the designation/tracking of instructor and flight leadership qualifications) took the next step. The Marine Corps added flight leadership qualifications to the MOS Manual, including 7533 Aircraft Section Lead ("authorized to plan, brief, lead and debrief a day or night section flight in all tactical scenarios attributed to their platform"), 7534 Aircraft Division Lead ("authorized to employ three or more aircraft in all tactical scenarios attributed to their platform"), and 7535 Flight Leader ("plan, brief and lead an element of at least 5 aircraft, incorporating fire support, strike or escort flight support"), among others.[160] (These MOSs serve only to track skills across the Service. As with most qualifications, T&R manuals identify currency requirements in the associated T&R events that may require an

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[157] Commandant of the Marine Corps, *MCO 3710.6 Marine Corps Aviation Training System (ATS)* (Washington, D.C.: Headquarters, United States Marine Corps, June 11, 2008).

[158] Mark Fenwick, "Aviation Training System," *Marine Corps Gazette*, May 2010, 53.

[159] Commandant of the Marine Corps, *MCO 3710.6 Marine Corps Aviation Training System (ATS)*, Enclosure (1), 6-2.

[160] Commandant of the Marine Corps, *NAVMC 1200.1B Military Occupational Specialties Manual* (Washington, D.C.: Headquarters, United States Marine Corps, July 1, 2016), Enclosure (1), 1-209 – 1-210.

aviator whose currency in qualification has lapsed to complete a refresher syllabus before being permitted to fly in the flight leadership role.)

This finally allowed the Service to track aviator manpower inventory (e.g., how many qualified CH-53E division leads the Service had) against inventory requirements (e.g., how many qualified CH-53E division leads the Service requires on Marine Heavy Helicopter Squadron [HMH] T/Os) using the manpower element designed by the Service specifically for skill tracking (i.e., MOSs) instead of having to resort to querying a separate unit readiness reporting database (i.e., M-SHARP). This was the latest step in achieving what Marine aviation training reformists had been asking for since 1961, when a qualified flight leader on the East coast could execute orders across country and "then [arrive] on the West coast ... barely qualified to fly solo."[161]

If the problem was instructors not qualified to make a subjective evaluation, Marine aviation's solution was to both make instructors more qualified to do so (by improving and standardizing instructor screening and training) but also to make the evaluations more objective (by standardizing training across the T&R manuals). The first approach was addressed, in part, with the formation of MAWTS-1 and the issuance of the WTTP (creating the first formal instructor framework), and then later with the creation of the ATS. The second approach was addressed, in part, by the Core Model Minimum Requirements (CMMR) and focus on core competencies in the revision of the Aviation T&R Readiness Program (addressed later in this chapter).

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[161] McClure, Jr., "One Book for Aviation," 60.

5.D.3. Continuous Training Standardization

During the 1950s and 1960s, in addition to the challenges of adapting an industrialized training program to the realities of the post-Korean War Marine Corps, the Service found that safety was a growing issue. "In FY1960 one out of every three aircraft produced was destroyed in accidents."[162] As one of a number of efforts to improve flight safety, leaders in Naval aviation reasoned that standardized training would result not just in increased safety but in increased combat effectiveness. Vice Admiral Robert Pirie, then Deputy Chief of Naval Operations (Air Warfare), decided that, for example "there must be one best way to make an approach in an A-4, or to recover from a Cutlass post-stall gyration, and other such matters. Therefore, he reasoned, let's get a team together and find that one best way."[163] The result, in May 1961, was the promulgation of *OPNAV Instruction 3510.9 Naval Air Training and Operating Procedures Standardization Program*, formally adopting the NATOPS program.

The NATOPS manuals would be written by their users, not any headquarters staff. At every echelon, aviators and aircrew would determine the most effective procedures for operating their aircraft, and higher echelons would filter and reconcile these procedures until the entirety of Naval aviation agreed. Only at that point would the Deputy Chief of Naval Operations (Air Warfare) approve the manual. Impressively, within twelve months, NATOPS manuals for forty-seven aircraft type had been issued.[164]

At the time, Naval Air Training Command and the USAF used standardization boards to both evolve and standardize aviation training procedures and implement safety mechanisms consistent with combat performance. In contrast, the Navy and Marine Corps fleet aviation had

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[162] Dalvin Serrin, "Standard Pilot," *Marine Corps Gazette*, June 1962, 40.
[163] Robert F. Dunn, *Gear Up, Mishaps Down* (Annapolis, MD: Naval Institute Press, 2017), 66.
[164] Robert F. Dunn, *Gear Up, Mishaps Down* (Annapolis, MD: Naval Institute Press, 2017), 67.

"no effective system for establishing, evaluating, and revising procedures which have proven to be operationally necessary. As a result, costly mistakes [were] corrected by one squadron only to be repeated by another with similar losses."[165] While the ad hoc process for standardizing the first edition of NATOPS manuals was adequate to get them published and in use, a formalized process was needed to enforce these procedures, develop new ones as required, and evolve and adapt them as Naval aviation (and its aviation platforms) evolved and adapted. The result was the standardization board.

In 1962, a proposal for adopting standardization boards gave them the responsibilities:

> (1) Maintain records to help the commander evaluate the proficiency and training of each pilot in the MAG.
> (2) Hold periodic meetings with the group and squadron operations officers to exchange ideas on tactics and doctrine.
> (3) Submit the results of these meetings to the commander in the form of recommended changes to SOPs or establishment of new ones.
> (4) Maintain the SOP for the commander in a format that would lend itself readily to changes and assure that as doctrine changes occur they are quickly incorporated.
> (5) Assume the duties now performed by the Instrument Board.
> (6) Administer a written examination to each pilot after each flight examination. (The test should require the pilot to demonstrate a knowledge of aircraft systems, emergency procedures, and SOPs.)[166]

While there was some resistance to this concept and the idea that such boards would limit the flexibility of commanders, the complete integration of the standardization board today and its importance in daily flight operations demonstrates that concerns such were ultimately not warranted.

Today, standardization boards are one of the primary tools for commanders in ensuring the operational readiness of their unit through SOPs and training progression while also ensuring

[165] Serrin, 40.
[166] Ibid.

an effective feedback mechanism that links operational units to MAWTS-1 and to the manuals and directives governing flight operations. Today, these boards primarily serve to:

> make recommendations for training progression, identify and mitigate safety issues or concerns, and provide tactical standardization for issues that arise during operations. This process, and its outputs, serve to make billets/qualifications a known entity and maintain an underlying attention to safety and standardization on an ongoing basis. [Standardization] boards are integrated and integral to training and help form or pull feedback from individuals and units. Additionally, standardization speeds things up and provides a measure of predictability, making planning easier, and enabling the unit to achieve a degree of tempo not otherwise possible.[167]

5.D.4. The Modern Aviation Training and Readiness Program

The modern Aviation T&R Program underwent a significant revision in the late 1990s (as a result of Marine Corps Combat Development Command's [MCCDC] 1994 *Training Readiness Needs Analysis Report*, discussed in Chapter 6). The goal was, in part, to re-envision how CRP would be calculated by introducing the concept of core competencies, the "compilation of 'core capabilities' and 'core skills' and provide a measurable definition of combat readiness."[168]

> For example, a draft of the revised T&R manual for the EA-6B includes a mission statement and five METL tasks. Also listed are core capabilities that include a desired standard for sustainment of operations and core skills that correspond to each METL. The core capabilities and core skills together, or core competencies, provide a more detailed picture of what an EA-6B squadron should be able to do than would the METL alone. The goal is to enable more effective training syllabuses by providing this more detailed and prioritized guidance.[169]

Importantly, a unit's readiness to execute its core competencies would be defined partially in terms of individual T&R training. The following paragraphs detail how the connection between individual training readiness and unit training readiness was designed.

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[167] AITSG Coordinator, *Wing Intelligence Support Company (WISC) Implementation Research Visit Trip Report* (Washington, D.C.: Headquarters, United States Marine Corps, Intelligence Department, August 18, 2018), 8.

[168] Anonymous, "T&R Review Underway," *Marine Corps Gazette*, July 1997, 8.

[169] Ibid.

5.D.4.A. Core Competencies

The core competencies approach and the impact that it had on readiness evaluation (and the training program to achieve that readiness) can best be understood by deconstructing a specific unit's readiness down to the conduct of individual T&R events.

A Marine Medium Tiltrotor Squadron (VMM) has five Core and five Core Plus METs (depicted in Figure 3).

VMM		
MISSION ESSENTIAL TASK LIST (METL)		
CORE		
MET	**ABBREVIATION**	**MCT DESCRIPTION**
MCT 4.3.8	**ALS**	Conduct Air Logistics Support
MCT 1.3.3.3.2	**EXP**	Conduct Aviation Operations From Expeditionary Shore-Based Sites
MCT 1.3.3.3.1	**SEA**	Conduct Aviation Operations From Expeditionary Sea-Based Sites
MCT 6.2.1.1	**TRAP**	Conduct Aviation Support of Tactical Recovery of Aircraft and Personnel
MCT 1.3.4.1	**CAT**	Conduct Combat Assault Transport
CORE PLUS		
MET	**ABBREVIATION**	**MCT DESCRIPTION**
MCT 1.3.4.1.1	**RI/E**	Conduct Airborne Rapid Insertion/Extraction
MCT 1.3.4.2.1	**ADGR**	Provide Aviation-Delivered Ground Refueling
MCT 1.3.4.3	**BI**	Provide Aviation-Delivered Battlefield Illumination
MCT 4.3.4	**AD**	Conduct Air Delivery
MCT 5.3.2.7.4	**AC2**	Provide an Airborne Command and Control Platform for Command Elements

Figure 3. VMM METL. Commandant of the Marine Corps, NAVMC 3500.11E MV-22B Training and Readiness Manual, Enclosure (1), 1-4.

To define objective readiness levels for these METs, the MV-22B T&R manual prescribes a MET Output Standard that articulates "The required level of performance a unit must be capable of sustaining during contingency/combat operations by MET to be considered MET-ready."[170] These output standards are depicted in Figure 4.

Thus, to take Marine Corps Task (MCT) 6.2.1.1 (Conduct Aviation Support of Tactical Recovery of Aircraft and Personnel) as an example, a (twelve aircraft) VMM must be able to sustain sixteen Tactical Recovery of Aircraft and Personnel (TRAP) sorties a day.[171] There are

[170] Commandant of the Marine Corps, *NAVMC 3500.14D Aviation Training and Readiness Program Manual*, 6-2.

[171] Sortie rates for each TMS are based on average sortie durations—this is 1.5 hours for rotary-wing and tiltrotor platforms, 1.3 hours for fixed-wing platforms other than the KC-130J, and 2.6 hours for the KC-130J.

two major components to sortie generation. The first is materiel readiness (i.e., having mission capable aircraft to fly), which, while critical to squadron operations, is not relevant to this research. The second is the availability of qualified crews, which is *central* to this research.

<table>
<tr><th colspan="10">VMM</th></tr>
<tr><th colspan="10">MISSION ESSENTIAL TASK (MET) OUTPUT STANDARDS</th></tr>
<tr><th colspan="10">CORE</th></tr>
<tr><th rowspan="3">MET</th><th rowspan="3">SKILL</th><th colspan="8">OUTPUT STANDARDS (BY NUMBER OF AIRCRAFT)</th></tr>
<tr><th colspan="4">MAXIMUM SORTIES BY MET</th><th colspan="4">MAXIMUM DAILY SORTIES[1]</th></tr>
<tr><th>12 A/C</th><th>8 A/C</th><th>6 A/C</th><th>4 A/C</th><th>12 A/C</th><th>8 A/C</th><th>6 A/C</th><th>4 A/C</th></tr>
<tr><td>MCT 4.3.8</td><td>ALS</td><td>16</td><td>10</td><td>8</td><td>5</td><td rowspan="12">16</td><td rowspan="12">10</td><td rowspan="12">8</td><td rowspan="12">5</td></tr>
<tr><td>MCT 1.3.3.3.2</td><td>EXP</td><td>16</td><td>10</td><td>8</td><td>5</td></tr>
<tr><td>MCT 1.3.3.3.1</td><td>SEA</td><td>16</td><td>10</td><td>8</td><td>5</td></tr>
<tr><td>MCT 6.2.1.1</td><td>TRAP</td><td>16</td><td>10</td><td>8</td><td>5</td></tr>
<tr><td>MCT 1.3.4.1</td><td>CAT</td><td>16</td><td>10</td><td>8</td><td>5</td></tr>
<tr><th colspan="6">CORE PLUS</th></tr>
<tr><th>MET</th><th>SKILL</th><th>12 A/C</th><th>8 A/C</th><th>6 A/C</th><th>4 A/C</th></tr>
<tr><td>MCT 1.3.4.1.1</td><td>RI/E</td><td>4</td><td>4</td><td>2</td><td>2</td></tr>
<tr><td>MCT 1.3.4.2.1</td><td>ADGR</td><td>4[2]</td><td>4[2]</td><td>2[2]</td><td>2[2]</td></tr>
<tr><td>MCT 1.3.4.3</td><td>BI</td><td>4</td><td>4</td><td>2</td><td>2</td></tr>
<tr><td>MCT 4.3.4</td><td>AD</td><td>4</td><td>4</td><td>2</td><td>2</td></tr>
<tr><td>MCT 5.3.2.7.4</td><td>AC2</td><td>4</td><td>4</td><td>2</td><td>2</td></tr>
<tr><td colspan="10">Note[1] A Unit is able to execute maximum daily sorties 16 total overall sorties on a sustained daily basis during contingency/combat operations. Based on historical flight hour data, average sortie duration is 1.5 hours for the Unit.</td></tr>
<tr><td colspan="10">Note[2] The number reflects refueling points vice sorties.</td></tr>
</table>

Figure 4. VMM MET Output Standards. Commandant of the Marine Corps, NAVMC 3500.11E MV-22B Training and Readiness Manual, Enclosure (1), 1-5.

The Aviation T&R Program uses the CMMR to define objective standards for this crew readiness component:

> The CMMR is an objective readiness metric derived by the community to meet the required output standards defined within a unit's core METs. This metric identifies the number of crews, composition of each crew, and the number of combat leaders required to meet the warfighting function of the unit. Each crew member is further identified within the CMMR by required skill proficiency. Attaining CMMR should be considered the minimal training objective.[172]

Figure 5 depicts the CMMR for a VMM.

[172] Commandant of the Marine Corps, *NAVMC 3500.14D Aviation Training and Readiness Program Manual*, 1-3.

VMM									
CORE MODEL MINIMUM REQUIREMENT (CMMR) FOR READINESS REPORTING									
CORE									
MET	SKILL	**CREW POSITION**				**FORMED CREWS (CREW CMMR)**			
		PILOT	CO-PILOT	CC	CC/AO	**12 A/C**	**8 A/C**	**6 A/C**	**4 A/C**
MCT 4.3.8	**ALS**	MSP,TAC	MSP	MSP	NSQ (LLL), TGQ	8	5	4	3
MCT 1.3.3.3.2	**EXP**	MSP,TAC	MSP	MSP	NSQ (LLL), TGQ	8	5	4	3
MCT 1.3.3.3.1	**SEA**	MSP,TAC	MSP	MSP	NSQ (LLL), TGQ, CQ	8	5	4	3
MCT 6.2.1.1	**TRAP**	MSP,TAC	MSP	MSP	NSQ (LLL), GTR	8	5	4	3
MCT 1.3.4.1	**CAT**	MSP,TAC	MSP	MSP	NSQ (LLL), GTR	8	5	4	3
CORE PLUS									
MET	**SKILL**	**CREW POSITION**				**FORMED CREWS (CREW CMMR)**			
		PILOT	CO-PILOT	CC	CC/AO	**12 A/C**	**8 A/C**	**6 A/C**	**4 A/C**
MCT 1.3.4.1.1	**RI/E**	MSP,TAC	MSP	MSP	NSQ (LLL), TGQ	4	3	2	2
MCT 1.3.4.2.1	**ADGR**	MSP,TAC	MSP	MSP	NSQ (LLL), TGQ	4	3	2	2
MCT 1.3.4.3	**BI**	MSP,TAC	MSP	MSP	NSQ (LLL), TGQ	4	3	2	2
MCT 4.3.4	**AD**	MSP,TAC	MSP	MSP	NSQ (LLL), TGQ	4	3	2	2
MCT 5.3.2.7.4	**AC2**	MSP,TAC	MSP	MSP	NSQ (LLL), TGQ	4	3	2	2
A standard MV-22B crew consists of two pilots, one crew chief, and one AG/O.									

COMBAT LEADERSHIP				
DESIGNATION	**12 A/C**	**8 A/C**	**6 A/C**	**4 A/C**
TAC	12	8	6	4
SEC LDR	8	5	4	3
DIV LDR	6	4	3	2
FLT LDR	3	2	1	1
AIR MSN CMDR	2	1	1	1

Figure 5. VMM CMMR. Commandant of the Marine Corps, NAVMC 3500.11E MV-22B Training and Readiness Manual, Enclosure (1), 1-6.

Thus, continuing with the TRAP MET as an example, a (twelve aircraft) VMM must have eight complete crews of the four prescribed crew positions, each with at least the minimum qualifications indicated. These qualifications, in turn, are defined by the completion of (and currency in) corresponding T&R events, tracked through M-SHARP.

For example, Figure 6 depicts individual qualification requirements for crew chiefs. Each four-digit code corresponds to a distinct T&R event.

Qualification	Event Requirements
NATOPS	6010R, 6011R , 6012R, 1841, 6030R
NSQ HLL	2310,2311,2340,2341
NSQ LLL	2380,2381,2382,2383
Day TGQ	2510,2511/2512/2513,2520/2521/2522,2540,2541
NS TGQ	2514,2515, 2542,2543
Day LATQ	2610,2611,2620,2640,2641
NS LATQ	2642,2643
GTR	2810,2811,2812,2813,2814,2815,2820,2831,2840
CQ	2930,2931,2940,2941,2942,2943
DWSQ	4210,4211,4220,4221,4222,4223,4240,4241,4242,4243,4244,4245
DCMQ	4310,4311,4312,4320,4340

Figure 6. MV-22 Crew Chief Individual Qualification Requirements. Commandant of the Marine Corps, NAVMC 3500.11E MV-22B Training and Readiness Manual, Enclosure (1), 3-5.

Thus, a VMM training officer, attempting to maintain or improve unit readiness, need only be concerned with ensuring that the right number of individuals maintain T&R event proficiency and currency in the events required for their designated crew positions. Collectively, this allows the squadron to source the required number of crews identified by the CMMR that, when combined with adequate aircraft readiness, will achieve MET-readiness for the entire squadron. Stated another way: the specificity of the T&R manual is such that the training readiness of an entire unit can be deconstructed to a list of specific T&R events for each pilot, co-pilot, and crew chief, making identifying training requirements for a training plan simple arithmetic and enabling sortie-based training.

VMM TACTICAL AND RESERVE SQUADRON					
CORE MODEL MINIMUM REQUIREMENT (CMMR) / READINESS REPORTING					
VMM MINIMUM CREW QUALIFICATIONS / DESIGNATIONS REQUIRED FOR MET CAPABILITY					
CORE METS	CREW POSITION				CREWS REQUIRED PER MET (CREW CMMR)
MCT	PILOT	COPILOT	CC	CC/AO*	12/8/4/6 A/C
1.3.3.3.1 **(SEA)**	MSP,TAC	NSQ(LLL),CQ,GTR	MSP	NSQ(LLL),CQ,GTR	8/5/3/4
1.3.3.3.2 **(SHORE)**	MSP,TAC	NSQ(LLL),GTR	MSP	NSQ(LLL),GTR	8/5/3/4
1.3.4.1 **(CAT)**	MSP,TAC	NSQ(LLL),GTR	MSP	NSQ(LLL),GTR	8/5/3/4
4.3.4 **(AD)**	MSP,TAC	NSQ(LLL),GTR	MSP	NSQ(LLL),GTR	4/4/2/2
6.2.1.1 **(TRAP)**	MSP,TAC	NSQ(LLL),GTR	MSP	NSQ(LLL),GTR	8/5/3/4
6.2.2 **(AE)**	MSP,TAC	NSQ(LLL),GTR	MSP	NSQ(LLL),GTR	8/5/3/4
CORE PLUS METS					SQD
1.3.4.1.1 **(RI/E)**	MSP,TAC	NSQ**(LLL),GTR**	MSP	NSQ**(LLL),GTR**	6/4/2/3
1.3.4.2.1 **(ADGR)**	MSP,TAC	NSQ**(LLL),GTR**	MSP	NSQ**(LLL),GTR**	4/3/2/2
1.3.4.3 **(BI)**	MSP,TAC	NSQ**(LLL),GTR, BI QUAL**	MSP	NSQ**(LLL),GTR**	4/3/2/2
5.3.2.11 **(AC2)**	MSP,TAC	NSQ**(LLL),GTR**	MSP	NSQ**(LLL),GTR**	4/3/2/2

VMM TACTICAL AND RESERVE SQUADRON	
COMBAT LEADERSHIP CMMR (6000 Phase)	
12/8/4/6 Aircraft	
DESIGNATION	PILOTS
TAC	12/8/4/6
SEC LDR	8/5/3/4
DIV LDR	6/4/2/3
FLT LDR	3/2/1/1
MSN CMDR	2/1/1/1

Figure 7. Legacy 2014 VMM CMMR. Commandant of the Marine Corps, NAVMC 3500.11D MV-22B Training and Readiness Manual, Enclosure (1), 1-7.

Comparing the CMMR of NAVMC 3500.11E (Figure 5) to the previous MV-22B T&R Manual, NAVMC 3500.11D (Figure 7) shows how continuous feedback, validation, and evolution of unit missions or modes of employment can result in changes to qualification requirements, designation requirements, or METs. In this case, between 2014 (NAVMC 3500.11D) and 2018 (NAVMC 3500.11E), a VMM:

- eliminated a MET (MCT 6.2.2 Conduct Air Evacuation)
- gained a MET (MCT 4.3.8 Conduct Air Logistic Support Operations)
- moved one MET from Core to Core Plus (MCT 4.3.4 Conduct Air Delivery)
- changed all copilot proficiency standards (to Mission Skills Proficient)
- changed the crew CMMR for two METs (from 4/4/2/2 to 4/3/2/2 for MCT 4.3.4 and from 6/4/3/2 to 4/3/2/2 for MCT 1.3.4.1.1)

5.D.4.B. Requirement, Certification, Qualification, and Designation Framework

Another measure of quality control instituted in the Aviation T&R Program is the Requirements, Certifications, Qualifications, and Designations (RCQD) framework, which recognizes that there are certain skillsets necessary to be able to reasonably evaluate another Marine's execution of a T&R event:

> Requirement Events consist of recurring or one-time events that are prescribed by governing directives applicable to a community. … A Certification refers to the formal endorsement of having attained a specialized skill. The evaluation process is conducted in accordance with the Certification event(s) by a designated instructor or authorized personnel … Qualifications are assigned to personnel based on demonstration of proficiency in a specific skill. All qualifications are assigned one or more required T&R Events. When all qualification requirements are completed and proficient, the individual may be granted the respective qualification … Designations are assigned based on demonstrated instructor or combat leadership proficiency. When all training requirements are completed, the respective Designation may be granted.[173]

While the differences within the elements of RCQD are nuanced and peculiar to Marine aviation, the salient point for this research is that the requirements to attain any RCQD are prescribed in the T&R manual. Therefore, the attainment of any RCQD is essentially a recognition that a Marine has completed the T&R requirements for a skill and that an authorized

[173] Ibid., 2-10 – 2-11.

individual (e.g., instructor or commander) has certified that the Marine is trained to the standard detailed by the T&R manual.

This framework enables key T&R events to be written such that certain skills are required to evaluate an event. In this way, the Aviation T&R Program is able to articulate requisite levels of competency (marked by the attainment of the required RCQD) for the instructor of certain events. This is in contrast to the Ground T&R Program which provides no framework for competency evaluation and where the least experienced member of a unit is no less qualified to evaluate whether an event was completed to standard than the most experienced member of the unit.

5.E. Summary

Over the last seven decades, Marine aviation has gained a deep cultural understanding of the link between training, readiness, and combat effectiveness. Consequently, it has spent those decades instituting processes to improve and optimize its training and readiness. The modern T&R framework, with its NMOSs for flight leadership, the ATS, the RCQD framework, and MAWTS-1, would certainly seem to an aviator from 1954 like bureaucracy run amok; a sclerotic, rigid, and over-standardized system that could not possibly work. But it does—and well. Why this is so is an interesting question.

Perhaps it has been the result of the combat imperative (get better or die). Perhaps aviation is an unparalleled force multiplier that also represents so much of a resource bottleneck that optimization of training provides comparatively more return on investment than in another area of the Service. Perhaps aviation and aviation ground MOSs are especially ‘engineering-based’ with training that is more quantifiable than ground MOSs.

Such a question may be unanswerable. It is certainly outside the scope of this research. But what is clear is that Marine aviation has consistently succeeded in training reform. And while it will forever have room for improvement, as a learning and optimizing organization, it has the tools it needs to adapt and change as the world evolves, and the Service with it.

This is evidenced not by the fact that it has achieved perfection, becoming static and unable to be improved upon, but rather by the fact that it changes regularly, constantly optimizing, rarely removing, and often improving previous processes and structures as improvements result in superior outcomes.

CHAPTER 6

CASE STUDY 2: HISTORY OF MARINE AIR INTELLIGENCE

> The ACE intelligence organization suffers from structural shortfalls and manpower problems. Adequate numbers of intelligence officers and enlisted analysts would, of course, greatly simplify the problem. … [However], providing adequate numbers of personnel to man ACE intelligence sections under current Tables of Organization is not possible under these constraints.[174]

An air intelligence Marine today might reasonably mistake this as the introduction to the WISC CONEMP. However, it was written three decades ago, by Lieutenant Colonel David Ingram. It is surprising how little has changed. The history of air intelligence is one of failed reform in many areas—not least of which is training. While some individuals have learned much, institutionally, Marine air intelligence has demonstrated little-to-no institutional learning over the last three decades (and it other ways, it has regressed).

It is important to understand the history that provides context to this attempted and failed reform: how air intelligence has been used, how it has been conceived of, its regularly-identified shortfalls, past attempts at reform, and why they have fallen short.

One might expect that we arrived at the current state of air intelligence by design—that previous lessons learned were captured by intelligent, capable intelligence Marines, implemented and incorporated by those following in their footsteps, and that the evolutionary pressures of combat have forced the organization to continually improve and optimize. This is not the case. Nor is it necessarily the history of the Marine Corps, institutionally. In the last two decades, the Marine Corps has varied in size, from 171,154 to just over 204,153.[175] Each year, approximately

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[174] David H. Ingram, "Marine ACE Intelligence Support" (master's thesis, Naval War College, 1988), 55.

[175] United States Marine Corps University. "End Strengths." *United States Marine Corps University*. https://www.usmcu.edu/Research/Marine-Corps-History-Division/Research-Tools-Facts-and-Figures/End-

30,000-40,000 Marines depart the Service, leaving the Marine Corps to recruit and train 30,000-40,000 new Marines each year.[176] This is an annual turnover of 15-22%. Compounding this is the promotion and re-assignment of the Marines who remain in the Service. The end result is the "Marine Corps turns over in its entirety approximately every five years."[177] This makes retention of institutional knowledge a challenge.

Added to this problem of high turnover is the fact that the history of air intelligence is one of special neglect. Its history shows that this can largely be attributed to three major factors. The first is the ACE developing into its role as a maneuver element during the early 1990s, since which it has never been challenged or contested for air superiority, providing few incentives and imposing few costs on its intelligence arm, which failed to evolve correspondingly. The second is the imposition of a Ground T&R Program ill-suited for support MOSs. And the third is the lack of any forcing function or accountability mechanism that links intelligence training completion to readiness metrics for any aviation units.

The context such a history provides is important to defining the topic—air intelligence (variously understood and defined over the years)—as well as establishing why previous efforts have failed, been inadequate, or were never undertaken. This history will also identify current characteristics of Marine air intelligence that bear upon and can be leveraged by future improvements, such as the WISC and SITCC, and the training improvements this research concludes are necessary.

Strengths/ (accessed April 16, 2019). The peak end strength in this period is from fiscal year 2009. The lowest end strength in this period is from fiscal year 1999.

[176] Marine Corps Intelligence Schools, *MCIS TC 18-1 Training Circulars* (Virginia Beach, VA: Marine Corps Intelligence Schools, August 26, 2018), 5.

[177] Ibid.

The history of Marine air intelligence can be divided into two broad eras: before and after the ACE was considered a maneuver element.

Prior to the 1990s, air intelligence suffered from the fact that Marine aviation was itself considered a supporting arm of the MAGTF, resulting in an intelligence discipline that warranted little special attention or differentiation and, in an institution as large and functionally-diverse as the Marine Corps, received none. Between 1989 and 1992, Marine aviation began to be considered a maneuver element in its own right, first in professional discourse, then in experimental employment during Operations DESERT SHIELD/DESERT STORM, and finally codified in doctrine in 2000.

This shift in the role of the ACE was accompanied by a corresponding, if exceedingly slow, recognition of the shifting role of air intelligence that continues today. Prior to 1990, air intelligence was hardly distinguishable from 'air reconnaissance,' a discipline distinct from other reconnaissance operations only in the method of intelligence collection, ignoring almost entirely any specialized intelligence support to aviation operations.[178] The second period has largely focused on air intelligence as intelligence support to aviation operations (e.g., support to COA and Concept of Operations [CONOPS] development for mission execution and tracking enemy air and air defense trends and tactics across the MAGTF's battlespace) with the attendant specialization in threat focus and intelligence support products and processes.

The first decade (1990s) of the ACE as a maneuver element saw advancements in air intelligence driven mainly by the fallout from Operations DESERT SHIELD/DESERT STORM.

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[178] "Air reconnaissance," in Marine Corps doctrine is employment of "visual observation and/or sensors in aerial vehicles to acquire intelligence information." Headquarters, United States Marine Corps, *MCWP 3-20 Aviation Operations*, 2-4.

Air intelligence benefitted by a general focus on intelligence reform but remained a niche topic that received scant attention.

The second decade (2000s) saw a decline in air intelligence advancement as two large ground wars consumed the Service's focus, generally devoid of any challenge to Marine aviation. This was compounded by efforts to standardize ground MOS training in a way that was ill-suited to support MOSs like intelligence, the effect being the erasure of any formal air intelligence training requirements. That this occurred on the eve of the Service's creation of its first air intelligence formal course locked in an impoverished framework for air intelligence training that endured for over a decade.

The third decade (2010s) has been generally characterized by the renewed focus on training that followed the decline in intensity of the wars in Iraq and Afghanistan. With more than a decade since the Van Riper Plan's full implementation, the shortfalls in air intelligence that continued to persist were highlighted by strategic competitors who had learned much from the performance of U.S. air power in Operations DESERT SHIELD/DESERT STORM and had spent the intervening decades developing the ability to deny the U.S. air superiority. The Marine air intelligence community achieve isolated pockets of improvement, culminating with the realization that a more dramatic and complete change was necessary in the form of the WISC.

6.A. Pre-1990s: Air Intelligence as Air Reconnaissance

Prior to the 1990s, air intelligence was not fully embraced by intelligence Marines (who saw higher headquarters ACE intelligence postings as a diversion and whose officers were excluded from squadron-level postings) nor fully embraced by aviators who staffed the squadron intelligence officer billets (who saw it as a second-class collateral duty). In almost all cases, intelligence officer billets up to the MAW G-2 were held by aviators. Specially-trained intelligence Marines (whose training often neglected aviation-specific intelligence considerations), if they were available, had little say in the operation of intelligence sections.

6.A.1. World War II - Vietnam

In a history of U.S. Army Air Corps air intelligence during World War II, one author wrote that "Unlike strategic bombing or fighter operations, air intelligence was not theorized and developed during the interwar period. Instead, air intelligence, particularly in the Pacific, was largely forged in the crucible of World War II."[179] Marine Corps air intelligence could certainly have been no better off. The history of Marine air intelligence, therefore, does not begin with the history of Marine aviation, but three decades later.

It is no surprise, then, that the first mention of Marine air intelligence discovered in archival research dates from 1945. An article in *Leatherneck* magazine discusses the importance of the Air Combat Intelligence Officer in helping aviation units assess effectiveness and identify enemy air-to-air trends and tactics that can be incorporated into plans or SOPs to improve lethality or enhance force protection. The author writes, "Although the chances are he himself can't fly, he's one of the most important cogs in any air outfit. No air unit, from the biggest air command to the smallest squadron, is without an air combat intelligence officer."[180] The author describes the air intelligence officers training as including "weeks of intensive study, which includes such formidable subjects as navigation and aerology. … Before he reports to duty in his combat area, the ACIO [air combat intelligence officer] goes to a corresponding overseas spot to gain background."[181] While this suggests a professionally- and rigorously-trained air intelligence

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[179] Kyle Bressette, "Design at the Edge of the World: The Birth of American Air Intelligence in the China, Burma, India, and the Pacific Theaters During World War II" (master's thesis, United States Air Force School of Advanced Air and Space Studies, June 2017), 4.

[180] Harold Helfer, "They Get The Scoop," *Leatherneck*, March 1945, 32.

[181] Ibid., 33.

officer, the account must be taken with a grain of salt given that it also claims "Some ACIO's come to understand the makeup and workings of the enemy planes so well that they can all but restore the shot down ones," making it hard to distinguish between fact, hyperbole, and wartime propaganda.[182]

The article does note the importance for the intelligence officer to understand friendly tactics in as much detail as Marine aviators so as to accurately assess enemy tactics and recommend countertactics, debriefing aircrews so as to understand evolving enemy tactics as well as battlefield observations, drafting intelligence and battle damage (sustained by Marine aircraft) reports that help the Service acquire new and better-designed or more survivable aircraft, and analyzing air reconnaissance photos to provide combat assessments or identify enemy formations.[183]

If true, this may be the most mature state of Marine air intelligence until after the Van Riper Plan. (That this comparatively high state of maturity existed virtually at the birth of the discipline is explainable perhaps by the high-intensity air and air defense combat of World War II.)

By 1955, when air intelligence is next mentioned, things have changed considerably, consistent with the significant draw-down and restructuring of U.S. military post-World War II. An article written by Captain James Johnson, entitled "The Business of: Aviation Intelligence," begins with what could be an abridged history of Marine air intelligence between 1945 and 1991: "You're assigned the Aviation Intelligence officer's billet. Chances are that you're a pilot. You're not happy."[184]

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[182] Ibid.
[183] Ibid., 32.
[184] James R. Johnson, "The Business of: Aviation Intelligence," *Marine Corps Gazette*, February 1955, 22.

The piece seeks to convince an audience of (pilot) air intelligence officers that despite their preconceived notions, the job can be both interesting and rewarding. This is a far cry from 1945, where the ACIO was "one of the most important cogs in any air outfit," and "The intelligence officer's interview with the men is considered so worthwhile that no matter how anxious the commanding officer is to talk with his men he usually waits until the ACIO has finished with them."[185]

In outlining the air intelligence officer's duties, the author makes an important point in his sequencing of these duties. He lists seventeen in total. The first five he states should be outlined in any existing intelligence section SOP:

- security management
- classified material control center
- public information (what would today be considered Open Source Intelligence [OSINT])
- command chronology officer
- publications officer[186]

Tellingly, only one of these (public information) would today be considered an intelligence duty (although at the time it was neither called OSINT nor considered traditional intelligence by custom or doctrine). He then lists twelve more duties of the intelligence officer not included in any intelligence section SOP. Only in this list can any serious intelligence responsibilities be found:

- training
- intelligence reporting database management
- liaison (an important technique to facilitate rapid dissemination of intelligence requirements and reporting that had special intelligence connotations it does not have today)
- reporting channels
- intelligence systems and equipment

[185] Helfer, 32-33.
[186] Johnson, 22.

- enemy recognition training
- intelligence reports writing
- intelligence briefings
- drafting of intelligence annexes to operations orders
- integration with operations
- staying on top of current reporting
- writing an SOP that encompasses all seventeen of these duties[187]

This underscores the opening of the article that: "The S-2 duties [at an aviation unit] vary among units probably more than any other military job" and "Probably nowhere else in the military field can personal initiative be so important."[188]

Both the omission of these intelligence duties in any SOP and the fact that these shortfalls persisted for nearly sixty years make this article an important yardstick against which future progress might be measured.

In 1968, Captain John Hathaway penned what is today considered the first serious documentation of Marine air intelligence shortfalls with the *Marine Corps Gazette* article "Air Intelligence MOS Needed." In a short but thorough page and a half, Captain Hathaway argues "it is painfully evident that we are overdue in establishing an Air Intelligence Officer specialty."[189] With its impossible-to-find enemy, the war in South Vietnam, he says, "is an intelligence war," but with its Surface-to-Air Missiles (SAM) and fighter aircraft, equally so the war in the North "is an electronics and intelligence war."[190] "The techniques and special knowledge for briefing air crews, flak analysis, maintaining radar order of battle, mission planning—indeed, the whole air intelligence support effort—can no longer be left to the unschooled improvisation of 'ground-oriented' intelligence personnel on their aviation tour."[191] In this, Hathaway outlines a number of

[187] Ibid., 22-23.
[188] Ibid., 22.
[189] John A. Hathaway, "Air Intelligence MOS Needed," *Marine Corps Gazette*, October 1968, 59.
[190] Ibid.
[191] Ibid.

shortfalls that would be encountered repeatedly over the next half century: the Marine Corps and much of its intelligence apparatus are ground-centric; and aviation operations and air and air defense threats require specialized intelligence knowledge and techniques that are either not taught or taught inadequately.

Captain Hathaway summarizes the curious state of air intelligence training at the time. Starting in 1966, Marines attended the Armed Forces Air Intelligence Training Center at Lowry Air Force Base in Colorado. Approximately half of the course material was oriented towards air intelligence (including topics such as "radar prediction," "Sino-Soviet operational weapons systems," and "mission planning and bombing") and half was oriented towards photographic interpretation (with topics such as "vertical photogrammetry," "tactical photo interpretation," and "photo intelligence reporting exercise").[192] Non-aviator Marine graduates received the MOS 0240 Photo Interpretation Officer, enlisted Marines received the MOS 0241 Photo Interpreter, but Marine pilots and NFOs received the MOS 0202 Intelligence Officer (an inversion curious today but unremarkable at a time when there were no unrestricted intelligence officers).[193] By comparison, USAF graduates of the course gained their Services' equivalents to both specialty codes and United States Navy (USN) graduates received a specialty code that encompassed intelligence, photographic interpretation, and radar analysis.[194] Captain Hathaway also describes the training to produce the enlisted MOS 0221 Air Intelligence Man: two-weeks at the Fleet Operational Intelligence Training Center to become a ground-oriented "intelligence clerk," followed by three months of MOJT (presumably for intelligence clerks assigned to aviation units), but no additional formal training.[195] This assignment of ground-oriented intelligence

[192] Ibid.
[193] Ibid.
[194] Ibid.
[195] Ibid.

enlisted Marines to air intelligence billets would continue for a half century until 2018, with the formalization of SITCC.

Captain Hathaway's article ultimately underscores the relative unimportance of formalized air intelligence training at the time. He recognizes that the "long OJT [On-the-Job Training] period to learn the specifics and techniques of air intelligence" for ground-oriented intelligence Marines (and therefore the delayed or marginal value these Marines add to the unit) leads to "a general downgrading of air intelligence in the Marine Corps. Air crews and commanders generally consider intelligence as 'nice to know' not 'need to know' because they are not used to thorough, lively intelligence support."[196] He even outlines a proposed solution, the 0205 MOS "Air Intelligence Officer," responsible for the air, air defense, and electronic warfare capabilities of the enemy, supporting mission planning and air reconnaissance, briefing and debriefing aircrews, and assessing enemy tactics and targets.[197]

The Vietnam period wraps up with two additional mentions of Marine air intelligence in professional journals. The first is a short, nine-paragraph article entitled "Consolidate Air Intelligence," arguing only for consolidating air reconnaissance platforms into an "aerial reconnaissance group."[198] The second, entitled "Aviation G-2 in the field" presents lessons learned from a 1972 2d MAW Air Combat Intelligence (ACI) field exercise. It recounts that virtually any officer may find him or herself designated an air combat intelligence officer and that "for the past three years … one of the few things any of the [2d MAW air combat intelligence officers] had in common was limited experience in aviation intelligence. Some had no prior intelligence experience."[199] It also mentions that while the G-2 ACI was a "proficient

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[196] Ibid., 59-60.
[197] Ibid., 60.
[198] Anonymous, "Consolidate Air Intelligence," *Marine Corps Gazette*, June 1971, 51.
[199] B. R. Jones, "Aviation G-2 in the field," *Marine Corps Gazette*, May 1973, 64.

team in garrison" the section struggled during the field exercises with no documentation or publications to guide their operations, which implies that 'garrison' operations did not involve training of value to intelligence operations in the field, adding in that "none of the members [of the ACI] had ever served previously an intelligence tour in aviation."[200] The remainder of article discusses the support requirements of operating an ACI, with the requisite establishment of field phones and runners, daily production requirements, and the limited communications nets available, providing little additional information useful to understanding the state of air intelligence training. Overall, this implies a perception that air intelligence is no different than ground intelligence (or that its unique aspects can be quickly picked up)—a concerning view coming from intelligence officers when contrasted by the complexities called out by Captain Hathaway (a pilot).

After the conclusion of Vietnam, Marine aviation found itself without a clear vision of how it would be employed in future conflict. Without a specific mission to train for, Marine aviation adopted "the position that we are trained and ready to fight anywhere and at any time. And so we concentrated our training efforts on perfecting only the mechanics of air warfare."[201] But while some were aware that "The mechanics of air warfare cannot be regarded separately from the geographical environment in which they must be applied," their solutions still only stopped at the recommendation that wing and group intelligence officers occasionally visit squadrons to deliver intelligence updates on areas of interest.[202] It was presumed that it would still be up to the pilots to "conduct map studies" and design training scenarios.[203] (The omission

[200] Ibid.
[201] Robert J. O'Rourke, "Instilling more direction and vitality into Marine aviation tactical training," *Marine Corps Gazette*, May 1979, 74.
[202] Ibid., 75.
[203] Ibid.

of the responsibility to understand enemy air and air defense threat in this discussion is informative.)

6.A.2. Post-Vietnam

The topic of air intelligence goes quiet in professional journals again at the conclusion of Vietnam. During this time, however, some significant changes were made to Marine intelligence, including the creation of an OccFld (02) for unrestricted intelligence officers around 1978 (although this continued to be seen by many as a 'second class' OccFld).[204]

During Operation URGENT FURY, the rescue of U.S. citizens in Grenada from 25 October – 2 November 1983, observers noted the limitations of appointing a pilot as the collateral-duty intelligence officer, with one after action report stating:

> Intelligence support to Marine tactical aviation was poor in that the aviation squadron intelligence officer (S-2) was by table of organization (T/O) structure a pilot with the additional assigned duty of intelligence, and consequently expected to fly combat missions rather than fulfill the responsibilities of the S-2.[205]

The report continued, noting also the assignment of the singular intelligence clerk to non-intelligence duties with the consequence that "No one was available to brief the pilots prior to their early morning flights, and no one was available to debrief the pilots, evaluate their information, and communicate intelligence to higher and adjacent units."[206] Damningly, the report notes in a parenthetical "although there was a carrier present, aviation intelligence assistance, which could have included the temporary assignment of naval aviation intelligence personnel to the unit, was not requested."[207] For Marine aviation, then, the operation appears to

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[204] H. T. Hagaman, "Marine Corps Intelligence," *Marine Corps Gazette*, January 1982, 51.

[205] Robert David Steele, *Intelligence Lessons Learned from Recent Expeditionary Operations* (Washington, D.C.: Headquarters, United States Marine Corps, Command, Control, Communications, Computers, and Intelligence Department, August 3, 1992), 98.

[206] Ibid.

[207] Ibid.

have been willfully conducted completely without intelligence. Other accounts of URGENT FURY suggest Marine aviation was not alone in its dearth of intelligence. Unfortunately for the state of air intelligence, the general success of the operation reinforced perceptions that air intelligence is optional in combat.

A Congressional study after the operation found that of "approximately 100 U.S. helicopters used on Grenada, nine were destroyed and a number of others were damaged" (including two Marine AH-1s from enemy fire and one CH-46 from a mishap not related to enemy action) despite defensive forces lacking SAMs, posing the question "What does it suggest our helicopter losses would be, for example, in a war in Europe?"[208] The report, authored by William Lind (who was often overenthusiastic in his derision for aviation), was soundly rebutted by the Joint Chiefs of Staff; however, there appears to have been little reaction with respect to intelligence.

The Marine Corps after-action makes the recommendation "to dedicate personnel to aviation intelligence down to the squadron level," although there is no evidence any action was taken on this after-action point until the Van Riper Plan.[209]

1988 saw the creation of the Surveillance, Reconnaissance, and Intelligence Group (SRIG), an effort to improve the Service's ability to fight in low- and mid-intensity conflicts. The SRIG would consolidate, at the Marine Expeditionary Force (MEF)-level, most of the high-demand, low-density intelligence capabilities within the MEF, including Radio Battalion, Force

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[208] Matthew G. Easley, "Survivability on the Island of Spice: The Development of the UH-60 Blackhawk and its Baptism of Fire in Operation URGENT FURY" (master's thesis, United States Army Command and General Staff College, 2015), 45, 52, 66; Atkinson, Rick. "Study Faults U.S. Military Tactics in Grenada Invasion." *The Washington Post.* April 6, 1984. Accessed November 16, 2018. https://www.washingtonpost.com/archive/politics/1984/04/06/study-faults-us-military-tactics-in-grenada-invasion/; Cole, Ronald H, *Operation URGENT FURY* (Washington, D.C.: Joint History Office, Office of the Chairman of the Joint Chiefs of Staff, October 25, 1983), 44.

[209] Steele, 108.

Reconnaissance, an Unmanned Aerial Vehicle squadron (then called a Remotely Piloted Vehicle Company), Air Naval Gunfire Liaison Company, and an Intelligence Company (itself containing imagery interpretation, topographic, Human Intelligence [HUMINT], ground sensor, counterintelligence, and production and analysis capabilities).[210] While the SRIG is often maligned in Marine intelligence history for an array of reasons, its creation is significant to air intelligence because it was designed to improve the Service's ability for intelligence to drive operations before Marine aviation was considered a maneuver element requiring such intelligence support. As a consequence, the most obvious legacy left by the SRIG, Intelligence Battalions (first as Intelligence Companies), were and remained ground-centric in focus, providing marginal value to the ACE as compared to the intelligence support it promised for the Ground Combat Element (GCE) and Command Element (CE).

To close out the 1980s, air intelligence made another appearance in the pages of the *Marine Corps Gazette* with a restatement of its central problem and calls for increasing the intelligence support available in the ACE. Citing the littoral regions and technology proliferation (especially air defense capabilities) that the Service continues to face in the future operating environment, intelligence officer Lieutenant Colonel David Ingram wrote "The environment faced by the ACE demands that we had better be serious about using tactical intelligence as a mission planning tool."[211] Using the failure of the *Luftwaffe* and success of the British Royal Air Force (RAF) during the Blitz as an example, Lieutenant Colonel Ingram stated that "The *Luftwaffe* established an intelligence officer at the *Geschwader* level (roughly equivalent to wing), but not at the group or squadron levels. On the other hand, the RAF placed intelligence officers throughout their organization, down to the squadron level," enabling them to respond

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[210] Gary I. Wilson, "The SRI Conceptual Architecture," *Marine Corps Gazette*, October 1988, 68-69.
[211] David H. Ingram, "'Fighting Smart' With ACE Intelligence," *Marine Corps Gazette*, May 1989, 38.

more quickly to changes in the battlefield and enemy tactics, but also to more effectively use aircraft as collection platforms.[212] Citing the unique structure and planning cycles and tools of the ACE, Lieutenant Colonel Ingram called for ACE intelligence to be appropriately trained and task-organized. Presaging the discussions of ACE maneuver and voicing the intelligence conclusions largely missing from the ACE maneuverist debates that would follow, Lieutenant Colonel Ingram wrote:

> The ACE's challenge lies not in obtaining the intelligence, but in creating an accurate tactical intelligence picture that is applicable to the ACE commander and the aircrews. The "big picture" is not a problem. The commander, his staff, and the pilots have simple intelligence needs: where is the enemy? What is he going to do? What are his vulnerabilities?[213]

In short, then, aviation needed specialized and time-sensitive intelligence to support ACE COA and CONOPS development, to enable the ACE commander to discover the enemy's surfaces and gaps, and maneuver, as part of the MAGTF, against them. Lieutenant Colonel Ingram acknowledged that "The assignment of intelligence officers at each squadron will not occur due to a Marine Corps aviation structure shortfall coupled with an undermanned intelligence occupational field" (even today, after significant growth in the OccFld, there remain insufficient air intelligence officers to assign one to each squadron).[214] Instead, he recommended commanders appoint their best pilots as intelligence officers and that they seek help from trained intelligence Marines at the group and wing echelons. But he also recognized the ground focus of the broader Marine intelligence apparatus, especially Signals Intelligence (SIGINT), calling for it to change its focus "towards meeting the needs of the ACE and not just the GCE."[215]

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[212] Ibid.
[213] Ibid., 39.
[214] Ibid., 40.
[215] Ibid.

6.A.3. Fleet Marine Force Manual 7-3: Air Support & Fleet Marine Force Manual 2-1: Intelligence

In addition to discussions in professional journals, the historic role of air intelligence can be understood through its appearance in Service doctrinal publications.

In 1969, *Fleet Marine Force Manual* (*FMFM) 7-3 Air Support* served as a single master publication for aviation operations.[216] It covered the fundamentals of Marine aviation (weapon systems, MAW organization, and ACE organization as part of the MAGTF), the Marine Air Command and Control System (MACCS--which at the time did not include the ACI as a distinct component of the Tactical Air Command Center [TACC]), the then-five functions of Marine aviation (Command and Control [C2] of aircraft and missiles was not included), Marine aviation planning processes, aviation logistics support, Marine aviation operations in support of various MAGTF operations (amphibious, ground combat, and special operations), and, importantly, a chapter on "Tactical Air Intelligence."[217]

At some point between 1969 and the 1980 edition of *FMFM 2-1 Intelligence Operations*, the intelligence publication annexed this chapter word-for-word.[218] The table of contents for this section of FMFM 2-1 is depicted in Figure 8.

In a manual of 175 pages (excluding front and back matter), four pages (just over 2%) for air intelligence is not a great deal (the average length for each of the seventeen chapters is 10.3 pages with a median length of six). However, it is significant that there is no 'Ground Intelligence' chapter. This both underscores the understanding that, unless otherwise specified,

[216] The 1969 version cancelled the 1966 version, which could not be found in archival research. It is likely the air intelligence content of the 1969 manual was also included in previous editions.

[217] Headquarters, United States Marine Corps, *FMFM 7-3 Air Support* (Washington, D.C.: Headquarters, United States Marine Corps, August 5, 1969), iii-viii.

[218] The 1980 FMFM 2-1 cancelled a 1977 version, which could not be found in archival research, making it possible this annexation happened earlier or that the two sections co-existed for a time.

‘intelligence’ primarily pertains to that which supports the GCE (consistent with Marine Corps planning doctrine at the time).

SECTION 16	AIR INTELLIGENCE	
1601	General	16-1
1602	Tactical Air Intelligence	16-1
1603	Air Intelligence Officer	16-1
1604	Target Intelligence	16-2
1605	Target Information	16-2
1606	Target Analysis	16-2
1607	Target Selection	16-3
1608	Flak Intelligence	16-3
1609	Elements of Flak Intelligence	16-3
1610	Sources of Information	16-3
1611	Application of Flak Intelligence	16-4
1612	Briefing and Debriefing	16-4
1613	Conduct of Briefings	16-4
1614	Conduct of Debriefings	16-4

Figure 8. FMFM 2-1 (1980) Table of Contents for Air Intelligence. Headquarters, United States Marine Corps, FMFM 2-1 Intelligence, vi.

The publication outlines some elements air intelligence responsibilities at the time, stating “Flak intelligence is usually prepared at the highest air component echelon of command in the particular area” and

> Combat briefings are generally conducted at the group level since this is the level in Marine aviation which normally has available all pertinent intelligence information pertaining to assigned missions. … In addition to the group and squadron briefings, it is normal for each flight leader to augment the general briefings with a briefing concerning specific details applicable to his assigned flight.[219]

This suggests that the lack or low number of intelligence Marines at squadrons (and the lack of primary air intelligence officers) was not a major limitation on normal aviation operations at the time as they regularly included group-level briefings where formally-trained intelligence Marines would be available (though pilots remained the primary intelligence staff officer at all echelons). It also stated that it was the responsibility of squadron flight leaders (not intelligence Marines) to

[219] Headquarters, United States Marine Corps, *FMFM 2-1 Intelligence* (Washington, D.C.: Headquarters, United States Marine Corps, September 30, 1980), 16-4.

brief intelligence specific to the flight. The publication outlines the intelligence subject matter the flight leader was doctrinally responsible for briefing as:

> a. Target information and means of target identification.
> b. Type and extent of target damage desired with instructions as to proper ordnance selection and fuze settings.
> c. Flak analysis of the target area and the routes to and from the target area.
> d. An appraisal of enemy electronics countermeasures that could affect the mission.
> e. A description of the character of the indigenous population and pertinent escape and evasion material.
> f. Weather briefing as to the target area, routes to and from the target, and probable weather at the recovery or home base upon return.
> g. Information concerning authentications, codes, signals, passwords, terrain, and survival.
> h. Other pertinent [Essential Elements of Information] of the commanders for overall intelligence information.[220]

This chapter, short as it was, was deleted sometime between 1980 and the February 1998 edition of *Marine Corps Warfighting Publication (MCWP) 2-1 Intelligence Operations*.[221]

6.A.4. Genesis of the Modern Air Combat Intelligence Section

The history of air intelligence from World War II through Vietnam shows that the MAW's primary command and control entity, the TACC, has always enjoyed some degree of air intelligence support. However, intelligence support was limited to the relatively simple G-2 structure described by Captain Jones in his 1972 article about the MAW G-2 in the field.[222] In the late 1980s, one Marine would begin efforts to design a more robust and tailored intelligence entity within the TACC, capable of supporting the modern intelligence support requirements of Marine aviation operations.

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[220] Ibid.

[221] The 1998 edition of MCWP 2-1 cancelled and superseded *FMFM 3-20 Commander's Guide to Intelligence* (dated 6 February 1991, but which could not be found in archival research), suggesting the manual underwent at least two major revisions between 1980 and 1998 (the 1998 MCWP remains the core of the current manual, *MCWP 2-10 Intelligence Operations*).

[222] Jones, 64.

In a 1988 thesis written for the Naval War College (which also served as the basis for his 1989 *Marine Corps Gazette* article, discussed previously), Lieutenant Colonel Ingram sought to "[evaluate] the capability of Marine air combat element (ACE) intelligence to support air command and control operations" by using a historical case study of the Battle of Britain to develop a model air intelligence structure and compare it to the structure then being adopted.[223] Lieutenant Colonel Ingram found that a number of key attributes could be identified for an effective air intelligence structure: "[specially-trained] intelligence personnel at all levels of the air organization," "rapid dissemination of combat information and intelligence" to support a force able to transit across large areas of operations (AO) in short periods of time, SIGINT capabilities, "science and technical intelligence" capabilities to exploit the sophisticated systems associated with air and air defense systems, accurate targeting supported by robust photographic intelligence, "integrated … ground control systems" with "intelligence elements at … key nodes," independent and unbiased intelligence estimates (and elements), and the integration of the intelligence function throughout the organization.[224]

After identifying these attributes, Lieutenant Colonel Ingram developed a concept articulating how air intelligence employs its capabilities to support the aviation planning cycle (while he did not term it a concept, it nonetheless generally fulfills the purpose of one). The development of this concept is significant because how air intelligence should support Marine aviation across a variety of ACE employment modes remains a point of debate today. It is possible that the concept developed by Lieutenant Colonel Ingram was forgotten largely because there was no doctrinal publication for air intelligence that could be updated with his recommendations. The fact that the Naval War College had to digitize it specifically for this

[223] Ingram, "Marine ACE Intelligence Support," ii.
[224] Ibid., 17-19.

study's archival research suggests it has not been widely read in recent memory. For these reasons, the core elements of his concept are worth reproducing here in full (at the time, the GCE, not the CE, was responsible for targeting, fire support planning, and COA development for the entire MAGTF):

> Step 1: The ACE/MAGTF develop offensive and defensive AAW [antiair warfare] targets.
> Gaining and maintaining air superiority is crucial to the success of the amphibious operation and comprises the ACE's highest priority task. The ACE staff analyzes both offensive and defensive AAW needs by evaluating the capabilities of the enemy air force and his air defenses. During this phase ACE intelligence must be able to collect, analyze and produce tactical intelligence relating to enemy air forces and air defenses on a continuous basis. Due to initial political and military considerations the MAGTF staff may play a role in the determination and prioritization of certain targets.
>
> Step 2: The GCE submits air interdiction targets by priority to the ACE for tasking.
> Targets planned by the GCE are provided to the ACE. ACE intelligence must provide detailed target intelligence for target analysis and the tasking of air assets. The previous intelligence centered on AAW targets, but the emphasis now changes. Although some target intelligence may be provided by the GCE to the ACE, target files must also be built to support the air interdiction targeting effort.
>
> Step 3: GCE fire support planning results in the submission of tactical air requests for close air support to the ACE.
> The GCE makes a determination of the preplanned and immediate close air support (CAS) mix of missions. These missions are then integrated into the fire support plans of the GCE. Finally, these requests are forwarded to the ACE for tasking. The intelligence activities of this phase center on the Direct Air Support Center (DASC), the air control agency responsible for the conduct of tactical air operations supporting the ground combat element. The DASC is normally collocated with the GCE's Fire Support Coordination Center (FSCC). The ACE intelligence organization must provide a functional intelligence element at the DASC to facilitate this air-ground intelligence coordination.
>
> Step 4: The assault support requirements of the GCE are submitted to the ACE.
> The air tasking order now begins to take shape as the tactical air requests are forwarded to the TACC from the DASC. The fixed-wing requirements have been determined, but the assault support needs of the GCE remain to be developed.
> Assault support planning calls for decentralized air-ground cooperation. This is due not

only to the Joint nature of helicopterborne operations but also to the slow speed and vulnerability of the aircraft. Dual intelligence requirements arise as a result of assault support planning and this means that close and continuous coordination between the intelligence sections of the GCE and ACE is not just required for mission success—it is essential.

Step 5: The Air Tasking Order is formulated and promulgated to aircraft bases and groups.
An ACE of wing size will in all probability be spread over numerous operating sites. As distance increases between the TACC and the aircraft groups the difficulty experienced in intelligence interchange will increase. Air intelligence target files, area studies and data bases are not suitable for transmission by traditional communications circuits, so dedicated means of transmission using state of the art technology are needed. The ACE intelligence organization must be able to pass target intelligence data, intelligence reports and near-real-time data to all ACE elements in a timely and efficient manner. …

Step 6: Missions are scheduled and executed.
After the missions have been executed the ACE intelligence section uses a variety of means to compile strike damage assessment information, evaluations of enemy actions reported by aircrews, resultant enemy order of battle information, and information relating to other new developments. Updates to current intelligence data must be made and enemy air, air defense and combat capabilities are reevaluated. The ACE intelligence organization must therefore be integrated into all ACE operational levels so as to exploit inherent ACE intelligence collection capabilities. The intelligence cycle continues as new estimates are used as the basis for new air tasking orders, target intelligence files are built or updated, and new intelligence is disseminated to aircrews.[225]

Using this concept, Lieutenant Colonel Ingram developed a "tactical intelligence ACE model" capable of providing adequate air intelligence support to Marine aviation. In chapter four of his thesis, he articulates these intelligence support requirements by element of the MACCS and by echelon of the ACE, recommending intelligence T/Os capable of fulfilling their associated duties and responsibilities for each element. Any Marine familiar with *MCWP 3-20F.2 Marine Tactical Air Command Center Handbook* would instantly recognize these roles as similar to those of the modern ACI. (By comparison, the G-2 2d MAW employed in the field in

[225] Ibid., 23-26.

1972 consisted of: journal, radio, work book, maps, and reports clerks; a small Order of Battle (OOB) section; and a targeting section—though with no doctrinal targeting role. None of these sections were integrated with the TACC.)[226]

Ultimately, he presents recommended T/Os for group S-2s, squadron S-2s, and what would become the modern ACI, identifying a functionally-aligned intelligence organization at every element and level: the TACC's intelligence section (the ACI) responsible for "analysis, target intelligence, signals intelligence, collection;" the Tactical Air Operations Center's (TAOC) section for "technical intelligence, estimates, time-sensitive data as required;" the DASC's section for "dissemination, current intelligence, ground-air intelligence coordination and interchange;" and group and squadron intelligence sections for "estimates, collection, target intelligence, current intelligence, dissemination."[227]

Such a model "meets the ACE-unique attributes of being capable of <u>continuous operations</u>, <u>conducting detailed target intelligence</u>, at both the TACC and air group levels and providing a <u>functional element at the DASC</u> to facilitate close, continuous intelligence coordination" and one "<u>integrated into all operational levels</u> at the critical nodes of the ACE."[228]

He compares his recommended T/Os to the new T/Os being adopted in mid-1988, which were

> not functionally structured to simultaneously support the sustained activities of target intelligence, air warfare analysis, intelligence collections, and the critical intelligence coordination activities associated with the DASC. This organization would have difficulty conducting the intelligence functions required by the ACE for 24-hour operations over an extended period of time.[229]

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[226] Jones, 64.
[227] Ingram, "Marine ACE Intelligence Support," 45.
[228] Ibid.
[229] Ibid., 49.

Table 1 depicts Lieutenant Colonel Ingram's recommended T/O on the left and the expanded G-2 T/O being adopted by the MAWs in 1988 on the right.

Table 1. 1988 MAW G-2 T/O and Lieutenant Colonel Ingram's Recommended T/O

Lieutenant Colonel Ingram's Recommended T/O

Section / Billet Description	Rank
G-2 Headquarters	
G-2	Colonel
Deputy	Lieutenant Colonel
Chief	Master Gunnery Sergeant
Admin	Sergeant
Clerk	Corporal
Collections Section	
Collections Officer	Captain
Collections Assistant	Gunnery Sergeant
Collections Specialist	Staff Sergeant
Collections Specialist	Staff Sergeant
Imagery Interpreter	Sergeant
Air Intelligence Operations Section	
Air Intelligence Officer	Major
Chief	Master Sergeant
SIGINT Officer	Captain
SIGINT Assistant	Gunnery Sergeant
Special Security Office Assistant	Sergeant
Special Security Office Assistant	Sergeant
Special Security Office NCO	Corporal
Analysis Section	
Chief Analyst	Captain
Science and Technology Analyst	Captain
AAW Analyst	Staff Sergeant
Air Defense Analyst	Staff Sergeant
Ground Analyst	Staff Sergeant
Air Intelligence Analyst	Sergeant
Air Intelligence Analyst	Corporal
Air Intelligence Analyst	Corporal
HUMINT Analyst	Gunnery Sergeant
Targeting Section	
Targeting Intelligence Officer	Captain

1988 T/O 8600 (MAW G-2)

Section / Billet Description	Rank
G-2 Headquarters	
G-2	Colonel
Deputy	Lieutenant Colonel
Chief	Master Gunnery Sergeant
Intelligence Assistant	Sergeant
Clerk	Corporal
Collections Section	
Collections Officer	Captain
Collections Assistant	Sergeant
Collections Specialist	Lance Corporal
Collections Specialist	Gunnery Sergeant
Imagery Interpreter	Staff Sergeant
Air Intelligence Operations Section	
Air Intelligence Officer	Lieutenant Colonel
Chief	Master Sergeant
SIGINT Officer	Captain
SIGINT Chief	Master Sergeant
SIGINT Support Assistant	Staff Sergeant
SIGINT Support NCO	Sergeant
SIGINT Analyst	Corporal
Analysis Section	
OOB Officer	Lieutenant
Ground Intelligence Officer	Lieutenant
Intelligence Clerk	Sergeant
Intelligence Clerk	Corporal
Intelligence Clerk	Lance Corporal
HUMINT Analyst	Gunnery Sergeant
Targeting Section	
Targeting Officer	Lieutenant
Targeting Analyst	Staff Sergeant
Intelligence Assistant	Lance Corporal
Intelligence Assistant	Lance Corporal

Lieutenant Colonel Ingram's Recommended T/O		1988 T/O 8600 (MAW G-2)	
Section / Billet Description	**Rank**	**Section / Billet Description**	**Rank**
Targeting Intelligence Assistant	Staff Sergeant	**Officers**	**8**
Targeting Intelligence Assistant	Sergeant	**Enlisted**	**19**
Targeting Intelligence Assistant	Sergeant		
Imagery Analyst	Sergeant		
Imagery Analyst	Corporal		
Air-Ground Intelligence Liaison Section			
Air-Ground Officer	Lieutenant		
Air-Ground Assistant	Staff Sergeant		
Intelligence Analyst	Sergeant		
Intelligence Analyst	Corporal		
Officers	**9**		
Enlisted	**27**		

Source: David H. Ingram, "Marine ACE Intelligence Support," 50.

In FY2019, the T/O for 2d MAW G-2 is fifty-nine Marines, depicted in Table 2.

Table 2. 2d MAW's FY2019 G-2 T/O

Section / Billet Description	Rank	BMOS ASD	PMOS
G-2 Headquarters			
Assistant Chief of Staff G-2	Colonel	8041	8041
Assistant G-2 Officer	Lieutenant Colonel	0202 0277D	0202
Intelligence Chief	Master Gunnery Sergeant	0291	0291
CI/HUMINT Specialist	Gunnery Sergeant	0211	0211
Intelligence Assistant	Corporal	0271 8623D	0231
Air Combat Intelligence Headquarters			
ACI Officer	Major	0277	0202
ACI Chief	Master Sergeant	0239	0231
EW Officer	Major	7588 0202D	7588
Cyberspace Security Technician	Corporal	1721	1721
Collections Section			
Collections Officer	Captain	0202	0202
Collections Chief	Gunnery Sergeant	0239	0231
Intelligence Assistant	Sergeant	0271	0231
Intelligence Assistant	Sergeant	0271	0231
Intelligence Assistant	Lance Corporal	0271	0231
Intelligence Assistant	Lance Corporal	0271	0231
Intelligence Assistant	Lance Corporal	0271	0231

Section / Billet Description	Rank	BMOS ASD	PMOS
Intelligence Assistant	Lance Corporal	0271	0231
Targeting (Air) Section			
Targeting Intelligence Officer	First Lieutenant	0277	0207
Team Chief	Gunnery Sergeant	0239	0231
Team Chief	Gunnery Sergeant	0239	0231
Team Chief	Gunnery Sergeant	0239	0231
Target Analyst	Sergeant	0271	0231
Intelligence Specialist	Corporal	0271	0231
Intelligence Specialist	Corporal	0271	0231
Order of Battle Section			
OOB Officer	First Lieutenant	0207	0207
Team Leader	First Lieutenant	0207	0207
Team Leader	First Lieutenant	0207	0207
Team Leader	First Lieutenant	0207	0207
Intelligence Clerk	Corporal	0271	0231
Intelligence Clerk	Corporal	0271	0231
Intelligence Clerk	Corporal	0271	0231
Intelligence Clerk	Corporal	0271	0231
Intelligence Clerk	Corporal	0271	0231
Intelligence Clerk	Corporal	0271	0231
Intelligence Clerk	Corporal	0271	0231
Intelligence Clerk	Corporal	0271	0231
Intelligence Clerk	Lance Corporal	0271	0231
Intelligence Clerk	Lance Corporal	0271	0231
Intelligence Clerk	Lance Corporal	0271	0231
Intelligence Clerk	Lance Corporal	0271	0231
Intelligence Clerk	Lance Corporal	0271	0231
Imagery Interpretation Section			
Imagery Intelligence Analyst	Gunnery Sergeant	0241	0241
Imagery Intelligence Analyst	Staff Sergeant	0241	0241
Imagery Intelligence Analyst	Sergeant	0241	0241
Imagery Intelligence Analyst	Sergeant	0241	0241
Imagery Intelligence Analyst	Sergeant	0241	0241
Imagery Intelligence Analyst	Sergeant	0241	0241
SIGINT Section			
SIGINT Officer	Captain	0202	0202
SI/EW Chief	Master Sergeant	2691	2691
ELINT Chief	Sergeant	2631	2631
ELINT Analyst	Corporal	2631	2631
ELINT Analyst	Lance Corporal	2631	2631
Special Security Office			

Section / Billet Description	Rank	BMOS ASD	PMOS
Wing Special Security Officer	Colonel	8042	8042
Assistant Special Security Officer	Lieutenant Colonel	0202	0202
Assistant Special Security Officer	Captain	0202	0202
Special Security Office Chief	Staff Sergeant	0271	0231
Aviation METOC Section			
METOC Officer	CWO3	6877	6802
METOC Chief	Gunnery Sergeant	6877	6842
	Officers	**14**	
	Enlisted	**45**	

Source: Headquarters, United States Marine Corps, *Fiscal Year 2019 T/O&E Report for 2d MAW.*

And by comparison, the T/O of an ACI in *MCWP 3-20F.2 Marine Tactical Air Command Center Handbook* (first published as MCWP 3-25.4 in 1998 with an identical ACI T/O) is eighty-nine Marines, depicted in Table 3.

Table 3. ACI T/O from MCRP 3-20F.2

Section / Billet Description	Rank	MOS	Number
Air Combat Intelligence			
ACI Officer	Lieutenant Colonel	0202	1
Assistant ACI Officer	Major	0202[230]	1
ACI Chief	Master Sergeant	0231	1
Assistant ACI Chief	Gunnery Sergeant	0231	1
ACI Operations Assistant	Sergeant	0231	1
ACI Operations Assistant	Corporal	0231	1
Intelligence Analysis Section			
Intelligence Analysis Officer	Captain	0202	1
Assistant Intelligence Analysis Officer	Captain	0202	1
All Source Intelligence Cell			
Senior Analyst	Lieutenant	0207[231]	2
Chief Analyst	Gunnery Sergeant	0231	2
Intelligence Analyst	Staff Sergeant	0231	2
Intelligence Analyst	Sergeant[232]	0231	2
Order of Battle Cell			
Order of Battle Analyst	Sergeant	0231	2
Order of Battle Analyst	Corporal	0231	2

[230] The manning document actually indicates "0202 or 0207." Translated into a T/O, this might include 0207D as an ASD for the billet, however, this is not normally found elsewhere as an ASD.

[231] The manning document actually indicates "0202 or 0207" however, it is likely this is an error as there are no 0202 lieutenants.

[232] The manning document actually specifies staff sergeant however, it is likely this is an error as it is included as a separate line (vice indicating a quantity of four in the line above).

Section / Billet Description	Rank	MOS	Number
Imagery Analysis Cell			
Imagery Interpreter	Gunnery Sergeant	0241	1
Imagery Interpreter	Staff Sergeant	0241	2
SIGINT Section			
SIGINT Officer	Lieutenant	0206	1
SIGINT Chief	Staff Sergeant	2621	1
SIGINT Support Clerk	Staff Sergeant	2621	2
SIGINT Analyst	Corporal	0231	1
Collections Section			
Collections Officer	Captain	0202[233]	1
Assistant Collection Officer	Lieutenant	0207[234]	1
Collection Chief	Gunnery Sergeant	0231	2
Collection Clerk	Sergeant	0231	2
Targeting Intelligence Section			
Target Intelligence Officer	Captain	0202	1
Assistant Target Intelligence Officer	Lieutenant	0207[235]	1
Target Intelligence Chief	Gunnery Sergeant	0231	1
Target Development Cell			
Target Development Officer	Lieutenant	0207[236]	2
Target Analyst	Staff Sergeant	0231	2
Target Analyst	Sergeant	0231	2
Target Validation Cell			
Target Validation Officer	Lieutenant	0207[237]	2
Target Analyst	Staff Sergeant	0231	2
Target Analyst	Sergeant	0231	2
Battle Damage Assessment Cell			
BDA Officer	Lieutenant	0207[238]	2
BDA Analyst	Sergeant	0231	2
BDA Analyst	Corporal	0231	2
Intelligence Plans Section			
Intelligence Plans Officer	Major	0202	1

[233] The manning document actually indicates “0202 or 0207.” Translated into a T/O, this might include 0207D as an ASD for the billet, however, this is not normally found elsewhere as an ASD.

[234] The manning document actually indicates “0202 or 0207” however, it is likely this is an error as there are no 0202 lieutenants.

[235] The manning document actually indicates “0202” however, it is likely this is an error as there are no 0202 lieutenants.

[236] The manning document actually indicates “0202 or 0207” however, it is likely this is an error as there are no 0202 lieutenants.

[237] The manning document actually indicates “0202 or 0207” however, it is likely this is an error as there are no 0202 lieutenants.

[238] The manning document actually indicates “0202 or 0207” however, it is likely this is an error as there are no 0202 lieutenants.

Section / Billet Description	Rank	MOS	Number
Intelligence Plans Chief	Gunnery Sergeant	0231	1
Intelligence Plans Analyst	Sergeant	0231	1
Requirements and Dissemination Section			
Research and Development Officer	Captain	0202[239]	1
Assistant Research and Development Officer	Lieutenant	0207[240]	1
Research and Development Clerk	Staff Sergeant	0231	2
Research and Development Clerk	Corporal	0231	2
Intelligence Systems Section			
Systems Officer	Lieutenant	0207	1
Systems Chief	Staff Sergeant	0231	1
Weather Section			
Weather Officer	CWO	6802	1
Weather Forecaster	Staff Sergeant	6842	1
Weather Forecaster	Sergeant	6842	1
Weather Observer	Sergeant	6821	1
Weather Observer	Corporal	6821	1
Radio Battalion Detachment			
Detachment Commander	Captain	0206	1
ELINT Chief	Staff Sergeant	2631	1
ELINT Analyst	Sergeant	2631	2
SIGINT Analyst	Sergeant	2629	2
SCI Communications Officer	Corporal	2651	1
TERPES Detachment			
OIC	CWO	2602	1
Detachment SNCOIC	Gunnery Sergeant	2631	1
Maintenance Technician	Staff Sergeant	2821	4
ELINT Analyst	Sergeant	2631	5
	Officers	**24**	
	Enlisted	**65**	

Source: Headquarters, United States Marine Corps, *MCRP 3-20F.2 Marine Tactical Air Command Center Handbook*, A-2 - A-4.

Lieutenant Colonel Ingram also recommended a MAG T/O, although his changes there are less significant, both compared to the mid-1988 T/O (Table 4) and to the modern MAG S-2 T/O (Table 5). However, today's MAG T/O has seen some rank reductions.

[239] The manning document actually indicates "0202 or 0207." Translated into a T/O, this might include 0207D as an ASD for the billet, however, this is not normally found elsewhere as an ASD.

[240] The manning document actually indicates "0202 or 0207" however, it is likely this is an error as there are no 0202 lieutenants.

Table 4. 1988 MAG S-2 T/O and Lieutenant Colonel Ingram's Recommended T/O

Lieutenant Colonel Ingram's Recommended T/O		**1988 T/O 8800 (MAG S-2)**	
Section / Billet Description	**Rank**	**Section / Billet Description**	**Rank**
Intelligence Officer	Major	Intelligence Officer	Major
Intelligence Chief	Master Sergeant	Intelligence Chief	Master Sergeant
Intelligence Operations Officer	Captain	Intelligence Officer	Captain
Chief Analyst	Lieutenant	Intelligence Officer	Captain
Air Analyst	Staff Sergeant	Intelligence Clerk	Staff Sergeant
Ground Analyst	Staff Sergeant	Intelligence Clerk	Sergeant
Collections Officer	Captain	Intelligence Officer	Lieutenant
Collections Assistant	Sergeant	Intelligence Clerk	Corporal
Targeting Intelligence Officer	Captain	Intelligence Officer	Lieutenant
Targeting Intelligence Chief	Gunnery Sergeant	Intelligence Clerk	Corporal
Targeting Intelligence Assistant	Sergeant	Map Compiler	Corporal
Targeting Intelligence Assistant	Corporal	**Officers** **Enlisted**	**5** **6**
Officers **Enlisted**	**5** 7		

Source: David H. Ingram, "Marine ACE Intelligence Support," 51.

And in comparison, Table 5 is the T/O for MAG-26 for FY2019.

Table 5. MAG-26's FY2019 T/O

Section / Billet Description	**Rank**	**BMOS ASD**	**PMOS**
	G-2 Headquarters		
Intelligence Officer	Captain	0202 0277D	0202
Assistant Intelligence Officer	First Lieutenant	0207	0207
Targeting Officer	First Lieutenant	0277	0207
Targeting Officer	First Lieutenant	0277	0207
Collections Officer	First Lieutenant	0207	0207
Dissemination Officer	First Lieutenant	0207	0207
Intelligence Chief	Gunnery Sergeant	0239	0231
Intelligence Specialist	Sergeant	0271	0231
Intelligence Specialist	Sergeant	0271	0231
Intelligence Specialist	Sergeant	0271	0231
Intelligence Specialist	Sergeant	0271	0231
Intelligence Specialist	Corporal	0271	0231
Intelligence Specialist	Lance Corporal	0271	0231
Intelligence Specialist	Lance Corporal	0271	0231
Intelligence Specialist	Lance Corporal	0271	0231
	Officers **Enlisted**	**6** **9**	

Source: Headquarters, United States Marine Corps, *Fiscal Year 2019 T/O&E Report for MAG-26*.

Finally, Lieutenant Colonel Ingram discussed squadron S-2 T/Os, with a pilot intelligence officer and two enlisted intelligence analysts for A-6, AV-8B, FA-18, and helicopter squadrons, mentioning that a pilot intelligence officer ensures the operational context necessary for intelligence support but leads to a competition of duties (flying versus intelligence) that tends to drive the pilot to focus primarily on a section's administrative duties, rather than those of the intelligence warfighting function.[241]

Ultimately, Lieutenant Colonel Ingram concludes:

> (1) The projected [mid-1988] wing intelligence section does not possess a structure capable of supporting the ACE.
> (2) There are not enough intelligence analysts in the wing intelligence section. The organization lacks eight analysts.
> (3) The manpower requirements generated by sustained 24-hour operations are not reflected in the current wing intelligence structure.
> (4) When conducting centralized intelligence operations at the air group level the group intelligence section is adequately structured to provide support to the group and squadrons when augmented with a squadron intelligence analyst.
> (5) Aviators assigned the primary duty as squadron intelligence officer can function well when provided with good training and when the squadron commander emphasizes billet continuity and importance.[242]

Finally, Lieutenant Colonel Ingram concluded that structural changes alone were not likely to be adequate and that specialized intelligence training would be required.

6.A.5. 1989-1992: Marine Aviation Leaves its Wingman

That the shortfalls Lieutenant Colonel Ingram identified existed when the ACE was considered a supporting element is somewhat understandable. Understanding how these shortfalls have persisted over the last thirty years requires an understanding of the evolution of the ACE as a maneuver element and when this evolution occurred.

[241] Ingram, "Marine ACE Intelligence Support," 52.
[242] Ibid., 53-54.

Prior to the 1990s, the ACE was considered a supporting arm, not a maneuver element, so its intelligence support requirements were limited.

Marine Corps doctrine explains: "A maneuver element is a distinct force that uses both fire and movement in engaging the enemy to generate and exploit an advantage over it as a means of achieving a specific objective."[243] Because of how this translates into mission planning and execution, understanding this period of evolution in the ACE's history—as well as when it took place in terms of conflicts fought—is essential for understanding why the ACE's intelligence arm failed to keep pace.

In early 1980, William Lind began introducing the concept of maneuver warfare to the Marine Corps. This concept, which took hold throughout the U.S. military to a varying extent, was developed in an effort to articulate how North Atlantic Treaty Organization forces could be expected to win in a non-nuclear conflict with the numerically-superior Warsaw Pact. Succinctly described in the Marine Corps capstone doctrinal publication, *Marine Corps Doctrinal Publication (MCDP) 1 Warfighting*, "Maneuver warfare is a warfighting philosophy that seeks to shatter the enemy's cohesion through a variety of rapid, focused, and unexpected actions which create a turbulent and rapidly deteriorating situation with which the enemy cannot cope."[244] As one observer noted, "Maneuver warfare, by its concentration on tactical excellence rather than numerical superiority, is uniquely suited to the Corps."[245]

Maneuver warfare failed to achieve the initial embrace that Marines today, indoctrinated on its virtues from day one, might expect. It fought for acceptance throughout the 1980s with leadership within the Corps split on the issue. Within the decade, however, the 29th CMC,

[243] Headquarters, United States Marine Corps, *MCWP 3-20 Aviation Operations*, 3-11.

[244] Headquarters, United States Marine Corps, *MCDP 1 Warfighting* (Washington, D.C.: Headquarters, United States Marine Corps, 1997), 73.

[245] R. Scott Moore, "The Art of MAGTF Warfare," *Marine Corps Gazette*, April 1989, 24.

General Al Gray, had made maneuver warfare the official warfare philosophy and doctrine of the Marine Corps with the publishing of *FMFM 1 Warfighting* (now *MCDP 1 Warfighting*), and Marines were debating vigorously in the pages of the *Marine Corps Gazette* how to apply it and what it meant for the Service.[246] During the 1980s, the GCE was the primary focus of this 'maneuver warfare reform.'[247] The debates around considering the ACE as a maneuver element only began in earnest with Major R. Scott Moore's article "The Art of MAGTF Warfare." In it, he highlighted the unique air-ground team that the MAGTF provides the Joint Force and its inherent ability to link decisive actions in the air and on the ground to achieve "a coherent, multidimensional campaign."[248] He continued,

> The truly unique aspect of the MAGTF resides in its aviation combat element (ACE). Marine propaganda aside, the ACE's true value does not lie in its ability to provide close air support to the rifleman. The MAGTF structure enables its commander to designate either a ground or air focus of main effort, greatly expanding his ability to keep an enemy off balance. The MAGTF thus becomes an operational level command, despite its relatively small size.[249]

In this short paragraph, Moore captures the essence of the debate. Is the ACE inherently subordinate to the GCE, tasked to provide the rifleman with mobility and fire support? Or can the ACE be employed independently (or supported by the GCE), able to achieve some battlefield decisions on its own or as the MAGTF's main effort?

The first view represented Marine Corps culture and doctrine in the 1980s and before:

> *Everything* in the Corps has supported the rifleman. Given that situation, then, just as the practice has been, the GCE should control all supporting assets to ensure that the needs of the rifleman are met efficiently and effectively. Marine officers of all ranks accept the

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[246] Gordon C. O'Neill and Daniel A. Driscoll, Jr., "Maneuver Warfare: Can the ACE Adopt This Philosophy of War?," *Marine Corps Gazette*, May 1991, 77.
[247] Moore, 27.
[248] Ibid., 25.
[249] Ibid., 26.

preceding statements without question, hence the resistance to the ACE in a maneuver role.[250]

The Marine Corps GCE has always contained "significantly less firepower than a comparable Army unit. The ACE was designed to satisfy those firepower requirements."[251] Thus, Marine aviation was born to be a sort of 'artillery from the sky' and, with the advent of the helicopter, became a new method of mobility for ground forces.

The second view represented culture and doctrine as it developed in the 1990s. Legacy doctrine, *FMFM 0-1 Marine Air-Ground Task Force Doctrine*, established the CE as little more than a coordinator of the various MAGTF components. The GCE primarily drove MAGTF operations with the other elements in supporting roles. The GCE was "responsible for developing courses of action for the MAGTF commander's approval. The primary role of the ACE and the [Logistics Combat Element (LCE)] during the formulation of courses of action is to determine if they can support them."[252] This arrangement even led to the placement of the DASC directly under the MEF, not under the command of the TACC, as it would be today.[253]

The evolution of the ACE as a maneuver element was therefore not merely academic, but had far reaching consequences for Service doctrine and force employment, development, and design. For example, with the ACE freed to employ fires in support of MAGTF objectives (occasionally decoupled from the GCE scheme of maneuver), fire support coordination would now need to shift from the GCE to the CE, placing this function "at the level more able to

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250 William H. Dixon, Jr., "The ACE Is Not a Maneuver Element-Yet!," *Marine Corps Gazette*, February 1992, 63.

251 Ibid., 59.

252 John B. Saxman, "The Role of Marine Aviation in Maneuver Warfare," *Marine Corps Gazette*, August 1989, 60.

253 LeRoy D. Stearns, *U.S Marines in the Persian Gulf, 1990-1991: The 3d Marine Aircraft Wing in Desert Shield and Desert Storm* (Washington, D.C.: Headquarters, United States Marine Corps, History and Museums Division, 1999), 147.

coordinate fires effectively for the entire force."[254] Additionally, the CE, now having to coordinate between at least two maneuver elements, required it to be responsible for COA development and driving MAGTF operations. The evolution of CE responsibilities in this context is underscored by the vigorous debate around the appropriateness of attaching GCE units to the ACE when the ACE was the main effort, a debate which often omitted the possibility of retaining normal command relationships and the CE, as the *command* element, and simply tasking the GCE to support, as appropriate.

Again, this distinction was not academic. The evolution of the CE's role, which the evolution of the ACE as a maneuver element implied, was so new that most authors engaged in the debate assumed that for the ACE to receive appropriate support, it was not sufficient to establish a *supporting relationship* between the ACE and GCE and that actual *command relationships* had to be changed. One author even stated, "The MAGTF staff would not be a good choice for developing courses of action. If it did, there would be little need for ACE and GCE commanders."[255]

Mr. Lind, who has a history of maligning aviation, generally, and aviators, specifically, himself joined battle in this debate.[256] Almost as though his intent was to provide the 'ACE maneuverists' with a straw man, he asserted "the purpose of aviation is to help achieve a decision on the ground."[257] Mr. Lind's dim view of aviation even drove him to make the argument that attacking critical lines of communication and sources of supply (from the air)

[254] Moore, 26.

[255] Steven B. Donnell, "The ACE as a Maneuver Element," *Marine Corps Gazette*, August 1989, 66.

[256] In the 1980s, Mr. Lind both made the case that "fighter jocks" are not intellectually up to the task of studying maneuver (despite esteeming one, Colonel John Boyd, as the father of the maneuver warfare concept) and that aviation had never been successful on the battlefield except when subordinated to ground forces (citing the *Luftwaffe*'s failure in the Blitz, but ignoring the RAF's success in the same campaign). William S. Lind, "Thinking beyond the cockpit," *Marine Corps Gazette*, June 1981.

[257] William S. Lind, "Maneuver Warfare and Marine Aviation," *Marine Corps Gazette*, May 1989, 60.

"does not have much effect on the enemy" and that the Marines would do better to pit their combat units directly against enemy combat units.[258] This determination to discount the ability of the ACE to achieve decision on the battlefield puts Mr. Lind in the awkward position of dismissing the 'battlespace framework' (also called the 'single battle concept') and making what appears to be an argument for attrition warfare.[259]

Mr. Lind's arguments against the ACE's potential in maneuver warfare, as weak as they may seem to the modern reader, are an important element in the history of this evolution. Even his most outlandish assertions gained traction within the Service, due to his cachet among many influential Marines at the time and the cultural differences between Marine ground and aviation communities. Ultimately, his misunderstanding of Marine aviation's potential incited a wave of Gazette articles to systematically dismantle these GCE-centric views.

These responses outlined of number of issues. One was the GCE focus of Service Professional Military Education (PME) and its impact on the Service's future commanders, making them "likely to squander their aviation resources."[260] Another was that the GCE and ACE both view the battlefield in different but complementary ways:

> The GCE is constrained by the realities of geography that limit its speed and mobility. … The ACE, on the other hand, operates on a battlefield basically unrestricted by geography. The ACE can more readily see the battle on the operational, as well as the tactical, level. The ACE has the mobility to influence the battlefield from well behind friendly lines to hundreds of miles into the enemy's rear area.[261]

[258] Ibid.

[259] The battlespace framework divides the battlespace up into a "close," "deep," and "rear" areas. Headquarters, United States Marine Corps, *MCDP 1-0 Marine Corps Operations* (Washington, D.C.: Headquarters, United States Marine Corps, July 26, 2017), 3-10.

[260] Saxman, 61.

[261] Ibid.

This, of course, provides the MAGTF commander much more room and opportunity for maneuver and improves his or her decision cycle considerably over a MAGTF driven only by the GCE. While modern artillery ranges have expanded significantly, one observer rightly notes,

> The GCE commander's area of influence is roughly 18-20 kilometers, which is the maximum range of his organic artillery. On the other hand, the MAGTF commander's area of influence is several hundred miles beyond the forward edge of the battle area … This influence is achieved by the long spear of the ACE's combat power—the AV-8Bs, A-6s, F/A-18s, AH-1Ws—as well as the other components of Marine aviation.[262]

These responses also identify that most ACE 'maneuver missions' were not new, but that the critical new difference was in command and control: "As a maneuver element, the ACE will exercise more control over its own actions and the shaping of the battlefield."[263]

This is the crux of why maneuver forces require more robust intelligence support: maneuver force commanders must understand the battlespace to such a degree as enables them to drive operations and achieve MAGTF objectives—not just support those forces that do.

The concept of the ACE as a maneuver element was first tested in combat around this time. In October 1990, 1st Marine Division, under the command of Major General James Myatt, was assigned elements of 3d MAW in direct support. Contrary to both doctrine and expectation, Major General Myatt intended to use the attack assets (both rotary- and fixed-wing) as a maneuver element to protect the division's flanks.[264] Indicative of the significant shift in ACE employment that this represented, the 3d MAW commander initially objected.[265]

Grudgingly acknowledging that the concept worked after being tested in exercises, but complaining of the difficulty it would present in the C2 of aircraft, 3d MAW leadership inadvertently hit upon the increased reliance on intelligence when using the ACE in a maneuver

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[262] O'Neill and Driscoll, Jr., 78.
[263] Donnell, 65.
[264] Stearns, 61.
[265] Ibid.

role, writing in a command chronology, "'The employment of [the aviation elements of Task Force Cunningham] was dependent on surveillance, identification and proper notification. The enemy must be seen, positively identified and his main body located in the order of march.'"[266] The challenge of this novel arrangement was that it bifurcated C2 of the ACE between those under the C2 of the ACE commander and those under the C2 of the GCE commander, limiting their ability to be optimally-directed or for the ACE to be maximally-responsive to changes in the battlespace.[267] Doctrine would eventually bridge this concept and its challenges by retaining aviation under the control of the TACC while still using some ACE elements in a maneuver role (under the authority of the commander of the ACE, rather than the GCE).

Finally, in these debates, the fairest ACE maneuverists acknowledged that the whole ACE was not capable of maneuver to directly achieve MAGTF objectives (although neither is the entire GCE) and that, while it is easy to see how fixed- or rotary-wing strike assets might accomplish maneuver missions, assault support assets seemed inherently tied to supporting roles.[268]

Collectively, these responses reiterated the ways in which MAGTF doctrine needed to be updated: to provide the CE a role in commanding instead of just coordinating, to issue mission-type orders and tactical tasks to the ACE (just as the GCE), and to enable the ACE to sometimes develop its own (and sometimes also the MAGTF's) operations. These changes shifted the ACE commander's decision cycle not in simply developing estimates of support to the GCE's scheme of maneuver but also in developing COAs and the CONOPS to achieve MAGTF objectives assigned to the ACE. As late as 1992, how this was to be done was still evolving.

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[266] Ibid., 63.
[267] Ibid.
[268] Dixon, Jr., 62.

What is missing from these arguments, unfortunately, is intelligence. Mr. Lind rightly points out that "the principal problem in air-to-ground work is not hitting targets but finding and identifying them," but then concludes that fast-moving aircraft are of limited use on the 'maneuver battlefield' because they prevent pilots from spotting and discriminating targets by eye (neglecting the possibility that other sensors might be at play and underlining his GCE-centric views by ignoring air targets).[269]

Even most ACE maneuverists missed the critical role of intelligence. The focus was on the *operational* capability of a force with a unique approach and ability to affect the battlefield, not on the corresponding intelligence capability necessary to enable it.

Only one observer specifically addressed the need for better and more tailored intelligence support when the ACE was used as a maneuver force, stating:

> intelligence requirements increase in both quantity and type. Quantity is due to the increased area of interest. Type, because the controlling headquarters must be able to employ real-time information as well as collect and process intelligence for a comprehensive picture of the battlefield.
>
> This ability is necessary because airpower must fight the immediate battle while anticipating and shaping the battle 24 to 96 hours ahead.[270]

Other than this, the closest mention intelligence receives is an example of *bad* air intelligence (from Mr. Lind, no less). As one ACE maneuverist notes:

> [Mr. Lind] wants … the ability to deliver weapons accurately while "jinking," something even our most advanced aircraft currently cannot do. Mr. Lind believes that "jinking" about the battlefield will allow the pilot to defeat the threat, which he identifies as primarily small caliber automatic weapons, not radar-guided antiaircraft artillery and SAMs. If Mr. Lind had done more research, he would have found that although jinking decreases an aircraft's chance of being hit by radar guided weapons, it actually increases

[269] Lind, "Maneuver Warfare and Marine Aviation," 60.

[270] Thomas X. Hammes, "Air as a Maneuver Element: An Idea Whose Time Has Come?," *Marine Corps Gazette*, February 1992, 71.

its exposure to barrage-type fire such as from automatic weapons. Speed and minimum exposure, not jinking, are the key to survival against this type of threat.[271]

Another ACE maneuverist states that "In order to survive in a high threat environment an aircraft must be able to operate at high airspeeds," the very feature Mr. Lind predicts will make aircraft useless on a maneuver battlefield.[272]

But these observers all fail to identify the increasingly important role of intelligence in a battlefield where air defense artillery (ADA) and SAMs are intermixed (a fact of the modern battlefield since Vietnam), where the use of proactive measures (such as detecting and avoiding or suppressing/destroying the threat), as opposed to reactive measures (attempting to defeat the threat after it has engaged you), is the superior tactic.

This omission of intelligence at first appears difficult to explain.

To view it from the perspective of capacity, a maneuver element must have adequate intelligence capacity to support its operations. A maneuver element needs to understand the battlespace in order to drive operations—that is: to help determine what, when, where, against whom, and to what end operations should take place (e.g., center of gravity analysis). In contrast, a supporting element must only understand the requirements leveraged upon it by the supported maneuver force and the intelligence parameters necessary to fulfill those requirements. The distribution of intelligence personnel and expertise throughout the MAGTF shows that the ACE is comparatively well-equipped with the capacity it requires.

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[271] Saxman, 63.
[272] Donnell, 65.

Within the OPFOR (i.e., excluding the supporting establishment and reserve components of the Service) the CE has 70% of intelligence billets (including the 02, 26, and 68 OccFlds), the GCE 15%, the ACE 13%, and the LCE only 3% (see Table 6).[273]

Table 6. Active Duty Marine Intelligence Billets by OPFOR Element for FY2019.

	OPFOR MAGTF Element			
OccFld	**CE**	**GCE**	**ACE**	**LCE**
02	59%	22%	15%	4%
26	93%	3%	5%	0%
68	42%	1%	56%	1%
All	70%	15%	13%	3%

Source: Data adapted from Headquarters, United States Marine Corps, *Fiscal Year 2019 MOS Pull Report.*

These numbers are not perfect representations of maneuver vs. non-maneuver units—there are 'non-maneuver' support units in the GCE and ACE and Intelligence and Radio Battalions' numbers are counted in the CE even while they sometimes provide detachments to the ACE or GCE. However, they are broadly representative of the relative weight of intelligence support to maneuver forces (i.e., ACE and GCE), headquarters elements (i.e., CE) that drive maneuver, and non-maneuver forces (i.e., LCE).

If this distribution of intelligence billets supports the assertion that a MAGTF maneuver element should receive a more robust intelligence support, then it appears the ACE has close to the capacity it requires.

Consistent with the documentation of air intelligence to this point, the principal shortfall then appears to be capability. If the development of an MSE as a maneuver element should necessitate both robust capacity and capability, it is reasonable to inquire why the Marine Corps has not seen an evolution of air intelligence *capability* that traces this development and evolution of the ACE as a maneuver element and the corresponding development of *capacity*.

[273] Headquarters, United States Marine Corps, "Fiscal Year 2019 MOS Pull Report" Total Force Structure Management System. October 18, 2018. https://tfsms-cognos.mceits.usmc.mil/.

The answer is in large part due to the Service's good fortune of engaging in wars over the last three decades where air superiority was never contested (either from the ground or the air).[274]

6.A.6. Pre-1990s Summary

Prior to the mid-1990s, the Marine Corps GCE operated under the assumption that it would be the supported element and the main effort for the MAGTF throughout all operations. The consequence for air intelligence was that Marine aviation was a supporting arm and did not need an intelligence capability to drive operations in the same manner as it would if it were a maneuver element. When Marine aviation was a supporting arm, it would not have been entirely appropriate to talk about air intelligence in the way it is meant by this research (supporting COA and CONOPS development). During this earlier era, when most referred to 'air intelligence' or 'aviation intelligence,' what they meant, consistent with the concept and conception of air intelligence at the time, was 'air reconnaissance.'

But as Marine aviation has grown into a maneuver element in its own right, the ACE developed a new operating concept, developing its own maneuver warfare doctrine. This new concept for Marine aviation changed the overall Service concept for employing its forces, resulting in the adjustment of GCE doctrine as well, recognizing that "No longer can the GCE expect to be the supported element or designated main effort during all phases of an operation."[275] This evolution from supporting arm to maneuver force should have greatly

[274] This is not to say there has been no air or air defense threat, but that U.S. forces have never been at risk of having their aviation operations denied or curtailed. The Operation DESERT SHIELD/DESERT STORM Coalition's combat losses of thirty-eight aircraft must be balanced against the nearly 65,000 combat sorties flown during the forty-three-day air campaign. This is not counting the tens of thousands of non-combat sorties flown under the umbrella of air superiority. United States General Accounting Office National Security and International Affairs Division, *GAO/NSIAD-97-134 Operation DESERT STORM: Evaluation of the Air Campaign* (Washington, D.C.: United States General Accounting Office, June 1997), 92.

[275] Headquarters, United States Marine Corps, *FMFM 6 Ground Combat Operations* (Washington, D.C.: Headquarters, United States Marine Corps, 1995), 1-1.

affected the concept of intelligence support to Marine aviation and resulted in modifications to air intelligence across the DOTMLPF&C spectrum.

However, with the rise of sophisticated air-to-air combat, especially involving the use of the electromagnetic spectrum (to include jamming and radar observation or targeting), Marine aviation began to be used in a manner both de-coupled from ground forces and requiring significant intelligence in its own right to support survivability and enhance lethality. As this development into a secondary maneuver force took place, certain observers began to notice the inadequacy of intelligence support to Marine aviation operations and it became increasingly obvious that it required its own maneuver intelligence support, more robust than that required by mere 'artillery from the sky.'

The issuance of *MCWP 3-2 Aviation Operations* (now serialized as MCWP 3-20) in the year 2000 formalized this transition of the ACE as a maneuver element, formally recognizing that not only can aviation "provide the decisive action in a battle" but that the full integration of ACE with the MAGTF makes a significant contribution to the MAGTF's collective ability to achieve decisive action.[276]

As ACE maneuver doctrine evolved, air intelligence was left behind. When it was considered, it continued to be conceived of in terms only of air reconnaissance or target intelligence, and not intelligence support to COA and CONOPS development:

> As Marine aviation strives to improve its contribution to a Corps employing maneuver warfare doctrine, locating and destroying or neutralizing the nodes and processes that allow the enemy to function should become a primary goal. Obviously Marine aviation has always sought these targets, but arguably they have not been central objectives in its operational concept, nor have the means for doing so been available. This is now changing. Aviation intelligence can make the location of nodes critical to the enemy's

[276] Headquarters, United States Marine Corps, *MCWP 3-20 Aviation Operations*, 3-5.

surveillance, targeting, fire support, communications, and logistics subsystems a more important focus in its collection/analysis efforts.[277]

Unfortunately, the Marine Corps continued to see air intelligence as a second-class niche capability in an already second-class field (i.e., intelligence). And without a serious threat to air superiority, Marine aviation was content to accept the risk of an underdeveloped intelligence capability even in its new role as a maneuver element. Consequently, ACE intelligence continued to receive remarkably little attention and no formal concept of air intelligence in support of an ACE capable of maneuver ever developed (with Lieutenant Colonel Ingram's concept never adopted).

When observers made note of its shortfalls and their real or potential consequences, their recommendations stopped short of fully addressing the root causes, were ignored, or both. Even after Lieutenant Colonel Ingram provided air intelligence with its first and only concept for how it supports Marine aviation, it led only to an organizational change, the modern ACI. While this is a significant development that should not be understated, the concept appears to have been entirely forgotten and, after the genesis of the ACI, air intelligence returned to ad hoc approaches, isolated in scope, which failed to adequately address the problem.

While the decade that followed would mark a turning point in the improvement of air intelligence, with more changes in the 1990s than in the entire history of Marine aviation prior, it would continue to exhibit the many of the same trends of neglect, abortive attempts at change, or neutered reform.

[277] John E. Greenwood, "Editorial: Aviation's Maneuver Doctrine," *Marine Corps Gazette*, December 1996, 2.

6.B. 1990s: The Sisyphean Decade

Marine intelligence underwent a great deal of reform in the 1990s, beginning with the fallout from Operations DESERT SHIELD/DESERT STORM. Many systemic problems of intelligence were finally addressed, focusing on reforming MOSs, career path, and formal training. Debates about the issues and their proposed solutions raged throughout the first half of the decade and the consequent changes consumed the second half. As a result, Marine intelligence generally improved well beyond what it had been before, but the pendulum of change slowed and began swinging back towards maintaining the status quo (encouraged by the major combat operations of the following decade) before attending to any major kinks.

By 1999, air intelligence found itself with two new MOSs. And while these continue to be useful and set conditions for future reforms, it is telling that the second MOS (0277) was created to address the shortfalls within the first MOS (0207)—and neither was entirely successful.

6.B.1. The Aftermath of Operations DESERT SHIELD/DESERT STORM

Operations DESERT SHIELD/DESERT STORM and their aftermath were traumatic for Marine intelligence.

> The intelligence support provided from both the national and tactical producers revealed a system that was unable to adequately support warfighters throughout all levels of command. … Commanders at all levels of I Marine Expeditionary Force (I MEF) had expressed bitter dissatisfaction about the poor intelligence support they received prior to and during the war.[278]

While some intelligence Marines would take issue with the accuracy of these complaints, "One area in which both defenders and detractors of the Gulf War performance of USMC intelligence

[278] Raymond E. Coia, "A Critical Analysis Of The I MEF Intelligence Performance In The 1991 Persian Gulf War" (master's thesis, United States Marine Corps Command and Staff College, 1995), 1.

saw the potential for improvement was the training and career development of intelligence professionals."[279]

The first reports about the disappointing performance of intelligence began trickling back before Operation DESERT STORM had even begun. Major Craig Huddleston opened the floodgates in what would become a torrent of gripes about and analyses of the performance of Marine intelligence, writing,

> I'm briefed every day about what every army, corps, division, and brigade in the Iraqi army's done that day. I know where the "national assets" are. I know when the [Palestine Liberation Organization] escorts Yassir Arafat to the head. I don't know what those four guys with NVGs (night vision googles) are doing 10 kilometers to my right, or who's hiding behind the next hill. … Intelligence guys, take off your trench coats, put on your flak jackets and helmets, and get *down*. We've got a lot to tell you, and we don't know all the questions.[280]

Five months later, the *Marine Corps Gazette* would publish an article written by Brigadier General Paul K. Van Riper, entitled "Observations During Operation DESERT STORM," in which he first expressed the dissatisfaction with intelligence that would see him appointed to fix it. "The weakest area I observed was tactical intelligence. Shortcoming existed at all levels" to include a failure "to establish an operational mindset."[281] While Brigadier General Van Riper did not write much more than this on the topic of intelligence, his was the first observation that attempted to identify the root cause. Instead of complaints about intelligence estimates that turned out to be wrong, not having timely access to the most recent reporting, or failing to build an operational picture from combat reporting, he saw that these

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[279] Paul et al., 153.

[280] Craig S. Huddleston, "Commentary on DESERT SHIELD," *Marine Corps Gazette*, January 1991, 32-33.

[281] Paul K. Van Riper, "Observations During Operation DESERT STORM," *Marine Corps Gazette*, June 1991, 58.

issues were second-order problems. “I had the sense many of the problems are endemic and stem from the way we select, train, and educate our intelligence personnel.”[282]

His article, and others like it, were met with a number of cogent defenses of intelligence’s performance. The sentiment of these counterarguments is best summed up by one of their authors: “Unfortunately, there has been very little constructive in the litany of ‘intel-bashing’ that followed the war. No one specified exactly what was broken, who might be responsible, or how to fix it.”[283] These defenders of intelligence generally attempted to blame commanders (or their operations officers) for failing to properly use their intelligence sections or for having unrealistic expectations. Some placed the blame on the SRIGs, which still lacked a doctrine for employment and were critically undermanned. Others asserted that failures or shortfalls at national and theater levels limited the effectiveness of tactical intelligence elements. Adjudicating this debate is moot at this point and certainly outside the scope of this research, however examination of some counterarguments is useful in elucidating the state of Marine intelligence and intelligence training at the time. Unfortunately, and predictably, air intelligence is nearly absent from these discussions (so much so that in the official history of 3d MAW—the ACE for I MEF—in the conflict, air intelligence is not substantively mentioned at all).[284] But it can be assumed that air intelligence was no better off than the ground-centric intelligence examples on which these

[282] Ibid.

[283] Harries-Clichy Peterson, Jr., “Intelligence: Fix It or Forget It,” *Marine Corps Gazette*, March 1992, 18.

[284] The two exceptions to this omission are: a complaint that current imagery was virtually non-existent for nearly the entire conflict and that most strikes were conducted based off no more intelligence that a grid coordinate—which more often than not turned out to be empty desert; and the complaint that “squadron intelligence was always a day late in any threat brief.” Stearns, 131, 161. In fact, the history’s command and staff list appendices list the officers leading various units’ S-1 (administrative and personnel), S-3 (operations), and maintenance sections, omitting the S-2 entirely. The amount of airfield matting laid during the conflict receives more mention than intelligence. The history, written less than ten years after the conflict, includes large volumes of operational information that would have been classified in 1990-1991. This indicates that substantial material was declassified by 1999, suggesting that neglect, not classification level, was what led to the omission of air intelligence’s role in the campaign.

intelligence officers made their defenses. In fact, given the history of air intelligence to this point, it is reasonable to believe that air intelligence was worse off, in most cases.

One intelligence officer who disagreed with the root causes identified by Brigadier General Van Riper, Major C. E. Colvard, made the point that prior to Operations DESERT SHIELD/DESERT STORM, "most training was conducted without employment of tactical intelligence assets."[285] Turning around the adage to 'train like you fight' he entitled his article "Unfortunately, We Fought Like We Trained." This led to operations planners who did not understand how to use or had unrealistic expectations of intelligence (one observer notes "Operators are notoriously careless about how they use their intelligence assets"), leading to intelligence planners who did not understand what intelligence support their operations counterparts required.[286] Like Brigadier General Van Riper, Major Colvard identified force structure and career path problems that perpetuated this dysfunction:

> Complicating the situation is the small number of intelligence officers at the rank of colonel. When the rare intelligence officer is finally selected for colonel, it is time for him to retire, or he is ready for a tour outside of [OPFOR] intelligence, either for career pattern or to enhance his promotion opportunity to general. Of course, I don't recall ever seeing a director of intelligence with an extensive intelligence background, certainly not a primary 0202.[287]

While the solutions offered by intelligence officers varied, there was a common thread throughout: intelligence officers lacked some degree of tactical or operational proficiency (which translated to a lack of credibility) and operational planners lacked an understanding of the intelligence warfighting function and how to properly employ it.

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[285] C. E. Colvard, "Unfortunately, We Fought Like We Trained," *Marine Corps Gazette*, September 1991, 20.

[286] Charles L. Armstrong, "Surviving the Storm: Will We Learn the Right Lessons From the Gulf War?," *Marine Corps Gazette*, March 1992, 41.

[287] Colvard, 22.

Throughout these years of debate, the problems of air intelligence received only three brief mentions in the *Marine Corps Gazette*. One intelligence advocate, arguing that intelligence officers, in general, are "well trained in their duties" acknowledged that "in the aviation combat element (ACE), 02s require extra ACE/air threat-oriented training not currently provided."[288]

Another discusses how the intelligence requirements for assault support aircraft are distinct from those of the rest of the ACE and thus require specialized products and techniques (with the most dangerous threat to assault support aircraft, small arms and heavy machine guns, generally ignored by high, fast fliers). He complained that these tend to be ignored both by most air intelligence Marines (who view such a threat as not worthy of study in comparison to high-tech SAMs and air-to-air missiles—and who lacked the appropriate training, anyhow) and by GCE intelligence Marines, who see "the requirements as a purely aviation matter and none of its concern, and the same attitude is often present within the Marine air-ground task force (MAGTF) command element."[289]

The final mention air intelligence received is from Colonel Ingram, who identified it as one of the "three basic factors that greatly influenced our operational intelligence effort in [Operations DESERT SHIELD/DESERT STORM]" (alongside centralization of intelligence and dissemination challenges).[290] Colonel Ingram identified that air intelligence is an area of "long-term neglect" for the Marine Corps in terms of the complexity required, necessary training, and appreciation of its importance in driving ACE maneuver operations:

> The warfighting functions of target intelligence, intelligence support to mission planning, developing target materials for target folders, learning to speak the language of the pilots and the air command and control system, and integrating electronic warfare/signals

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[288] Walter F. McTernan III, "Intelligence: You Get What You Pay For," *Marine Corps Gazette*, March 1992, 23.

[289] Bruce R. Morrison, "Intelligence Requirements For Assault Support Aviation," *Marine Corps Gazette*, May 1992, 66.

[290] David H. Ingram, "Fixing Intelligence: It's Decision Time." *Marine Corps Gazette*, June 1992, 65.

> intelligence can only take place when we train and equip our Marines properly. Air intelligence is the toughest challenge in the business, and when the aviation combat element has good intelligence and a responsive source of imagery, the payoff for the MAGTF is immeasurable.[291]

Refreshingly, he offered a number of solutions. First, "give priority to the S-2 billets in the divisions and wings where our commanders, staffs, mission planners, and pilots need intelligence. As much as it may hurt us elsewhere, there is no substitute for intelligence officers in selected squadrons."[292] And second, orient intelligence training to the skills required by supported units in combat. While Colonel Ingram was speaking about fixing intelligence issues across the MAGTF, he highlighted in this second solution the special attention needed in air intelligence: "Air intelligence training is critical, as is developing target folders, target materials, and other intelligence for aircrew. This is a showstopper."[293]

Concurrent with these discussions of Marine Corps intelligence's performance during Operations DESERT SHIELD/DESERT STORM, a series of Mission Area Assessments (MAA) were conducted, finding specific deficiencies in intelligence support to Marine aviation in at least three of the six functions of Marine aviation.[294] MAAs are conducted in support of the Concept Based Requirements System (the same system used by Major General Van Riper's team in developing the Van Riper Plan) to provide a report to Congress on current Service capabilities prior to any major system acquisition (to base the new acquisition on a formal assessment of current Service deficiencies).[295] These MAAs, completed between 1991 and 1994 found the following intelligence-related deficiencies: "The Effectiveness of Intelligence Supporting the

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[291] Ibid.

[292] Ibid.

[293] Ibid., 66.

[294] No specific intelligence deficiencies were identified for EW, no MAA was found for air reconnaissance, and archival research found that an MAA for OAS was conducted, but the report itself could not be found.

[295] Marine Corps Combat Development Command, *Marine Corps Mission Area Analysis MA-32: Antiair Warfare* (Quantico, VA: Marine Corps Combat Development Command, January 1994), 1.

AAW Mission is Limited," "The MAGTF is neither staffed nor trained to fully support the intelligence requirements of assault support," and "The MACCS Has an Inadequate Capability to Collect/Access, Receive, Process, and Disseminate Intelligence."[296] Recommendations to address these deficiencies included the introduction of Intelligence Preparation of the Battlespace (IPB) into MACCS operations, the development of air intelligence doctrine, a replacement for the SRIG, the development of scenarios that would use intelligence Marines during exercises as they would be used in combat, development of standard air intelligence training programs (to include both formal course training and MOJT), including in readiness evaluations the capability of a squadron to conduct intelligence activities, and the creation of formally-trained air intelligence officers and their placement at the squadron level.

With the exception of an abortive attempt to develop doctrine (i.e., FMFM 3-27), none of these recommendations ever appears to have been implemented (those implemented years or decades later, after the deficiencies were repeatedly identified in a variety of other forums, are difficult to attribute to these reports), despite the intelligence field undergoing significant review and change at the same time as these MAA findings. Such a disconnect suggests that the lack of a center of excellence for air intelligence (MAWTS-1 was not yet hosting an Intelligence WTI course) and the lack of an air intelligence MOS gave Marine aviation extremely little 'connective tissue' into the Marine Corps intelligence community, substantially limiting the Service's ability to affect these changes. This structural disconnect perpetuated these problems longer than necessary.

[296] Ibid., 5-15; Marine Corps Combat Development Command, *Marine Corps Mission Area Analysis MA-33: Assault Support* (Quantico, VA: Marine Corps Combat Development Command, November 1991), 23; Marine Corps Combat Development Command, *Mission Area Analysis (MAA) of Mission Area 35 - Command and Control of Aircraft and Missiles* (Quantico, VA: Marine Corps Combat Development Command, July 1994), 5-20.

6.B.2. FMFM 3-27 Aviation Intelligence

The MAA for Assault Support in late 1991 recommended "The unique requirements of air intelligence should be clearly defined in a doctrinal publication in either FMFM 3-21, MAGTF Intelligence Operations, or by developing a separate publication in the FMFM 3-2 series."[297] *FMFM 3-27 Aviation Intelligence* was apparently the Service response to this finding.

Little information about FMFM 3-27 exists (3-2X, though an operational series today, was the serialization for manuals pertaining to intelligence operations until the Service's doctrinal overhaul in the late 1990s). The publication was planned, and written, and in 1992 it was staffed as a coordinating draft (a complete draft, staffed for coordination by all affected units/agencies), but never progressed and was cancelled in 1996 without ever having been published.[298]

The 1999 Intelligence T&R Manual contained twenty-seven events with FMFM 3-27 listed as a reference, the relative diversity of which suggest FMFM 3-27 covered issues including: targeting support, briefing and debriefing, techniques for analyzing and presenting air and air defense threats, and support to air reconnaissance. Just as important as where FMFM 3-27 appeared as a reference is where it did not. For example, while "223-ANA: Conduct air defense analysis" included it as a reference, "219-OOB: Ensure the maintenance of enemy ground, air, air defense, electronic, missile, and weapons of mass destruction order of battle

[297] Marine Corps Combat Development Command, *Marine Corps Mission Area Analysis MA-33: Assault Support*, 24.

[298] Marine Corps Combat Development Command, *Mission Area Analysis (MAA) of Mission Area 35 - Command and Control of Aircraft and Missiles*, 5-21. As late as December 1995, MCCDC was still planning a 'third level' doctrinal publication (i.e., covering specific TTPs) covering aviation intelligence. By November 1996, a *Proceedings* article described the manual as cancelled. It is difficult not to interpret the fact that the publication limped on for four years as a coordinating draft without being published as an indicator of the low prioritization or neglect of the subject. When coupled with the fact that an entire draft was completed and then discarded, such a conclusion seems even more likely. John D. Williams, "Revising Marine Corps Intelligence Doctrine," *Marine Corps Gazette*, December 1995, 41; Jeffrey S. Cartwright, "Aviation Intel Isn't Ops," *Proceedings*, November 1996, 46.

files" did not. This suggests that the authors of the first Intelligence T&R Manual, as late as 1999, were familiar with the content of FMFM 3-27. Had they not been, a more indiscriminate inclusion of it as a reference in the manual would be expected.

While conclusions based on this relative paucity of evidence cannot be drawn with much confidence, it seems more likely than not that the Marine Corps air intelligence community had a relatively useful publication in the draft of FMFM 3-27. Its eventual erasure, becoming a literal footnote in every piece of documentation discovered during archival research, speaks to the air intelligence community's inability to make progress and solidify improvements.

6.B.3. Intelligence Preparation of the Battlespace

Shortly after Operations DESERT SHIELD/DESERT STORM and at the same time as the Van Riper Plan was being developed, the Service formally adopted IPB, a process that would dominate how the Marine Corps intelligence community conceived of and taught intelligence.

IPB "is the systematic, continuous process of analyzing the threat and environment in a specific geographic area."[299] Within the U.S. military, it originated as a U.S. Army process developed after the Yom Kippur War in 1973, becoming "the centerpiece of [U.S. Army] intelligence doctrine" by 1986.[300] The Marine Corps appears to have first seriously experimented with IPB during Operations DESERT SHIELD/DESERT STORM, when I MEF had an attachment of Army soldiers from 513th Military Intelligence Brigade who used it "to facilitate the identification of targets, focus collection planning, and provide input regarding potential Iraqi courses of action."[301] As the Marine Corps looked to formally adopt this Army methodology

[299] Headquarters, Department of the Army and Headquarters, United States Marine Corps *MCRP 2-10B.1 Intelligence Preparation of the Battlespace* (Washington, D.C.: Headquarters, Department of the Army, Headquarters, United States Marine Corps, November 2014), 1-1.

[300] Russell H. Thaden, "Intelligence Preparation of the Battlefield and Predictive Intelligence" (School of Advanced Military Studies, U.S. Army Command and General Staff College, 1986), 1.

[301] Michael A. Cicere, "The Marine Corps Adopts IPB," *Marine Corps Gazette*, September 1992, 26.

towards the end of 1992, early observers noted some idiosyncrasies, born out of its Army roots, which would require adjustment or alteration for effective use in the Marine Corps:

> The Marine Corps' expeditionary/amphibious character, limited manpower, and limited organic topographic capability demand a fresh approach to IPB. The Army's *FM 34-130 Intelligence Preparation of the Battlefield*, can be used as a baseline, but not as a substitute for our own doctrine. … IPB methodologies for amphibious operations, air (fixed-wing) operations, and low-intensity conflict need to be formulated.[302]

Unfortunately, this tailoring to unique Service needs never occurred. To date, the IPB publication is issued under both Army and Marine Corps doctrinal serials (i.e., the same publication, dual-issued) and indicates differences between Services with the Marine Corps modifications following Army sections, but in italics. The Marine Corps differences are largely limited to terminological differences, falsely conveying the sense that the only adjustments needed are superficial in nature (see Figure 9).

INTELLIGENCE PREPARATION OF THE BATTLEFIELD/ *BATTLESPACE* (IPB)

1-1. **Intelligence Preparation of the Battlefield (IPB) is the systematic process of analyzing the mission variables of enemy, terrain, weather, and civil considerations in an area of interest to determine their effect on operations. *Intelligence Preparation of the Battlespace (IPB) is the systematic, continuous process of analyzing the threat and environment in a specific geographic area.***

1-2. The G-2/S-2 begins preparing for IPB during the generate intelligence knowledge task/*problem framing step*. (For U.S. Army, see FM 7-15, chapter 2, for the complete list of tasks and their measures of performance. *For the Marine Corps, see MCWP 5-1 for information on problem framing.*) The intelligence staff creates data files and/or databases based on the operational environment. Given the limited time available to collect and evaluate information, this information may not be specific enough to support the military decisionmaking process (MDMP)/*Marine Corps Planning Process (MCPP)*. However, this information helps create the operational environment frame during the design methodology.

Figure 9. Service Differences in IPB Doctrine. Headquarters, Department of the Army and Headquarters, United States Marine Corps MCRP 2-10B.1 Intelligence Preparation of the Battlespace, 1-1.

The failure to adequately tailor this Army process to Marine Corps needs results in deficiencies with respect to supporting aviation operations. For example, while the publication discusses avenues of approach as "air or ground routes used by an attacking force leading to its

302 Ibid., 27.

objective or to key terrain in its path," the description that follows (and provides the basis for all IPB training and education in both Services) discusses only characteristics affecting ground avenues of approach (e.g., marshes, swamps, jungles) while omitting any discussion of characteristics affecting aviation avenues of approach (e.g., terrain masking of radar coverage or acoustic propagation, altitude limitations for passengers transport). Additionally, the examples it provides, both verbally and in illustrated figures, exclusively reference ground forces and operations.

Many air intelligence Marines have heard the refrain: "IPB is IPB is IPB—there is no 'air IPB.'" But this is only half true. IPB can indeed be used for military operations in any domain. However, IPB's origins in the Army ensured that the process has remained rooted in ground combat. Despite the high number of rotary-wing platforms the army flies as an integral part of combat formations, doctrinally it does not recognize them or their intelligence support needs as distinct from those of the ground forces.

The consequence of this doctrinal refusal to acknowledge differentiation should not be understated. Part three of the IPB publication includes four chapters for "Considerations for Specific Operations, Unique Environments, and Missions," none of which include or suggest aviation (see Figure 10).[303] The word "aviation" only appears in the publication nine times, seven when discussing weather impacts, once in reference to enemy aviation supporting a ground defense, and once defining the acronym "ACE" ("ACE" is only used four times, all in an example COA comparison and decision matrix), which is to say: in no meaningful way.

The consequence is a publication and, consequently, an intelligence doctrine largely blind to the support requirements of aviation operations.

[303] Headquarters, Department of the Army and Headquarters, United States Marine Corps *MCRP 2-10B.1 Intelligence Preparation of the Battlespace*, iii.

PART THREE CONSIDERATIONS FOR SPECIFIC OPERATIONS, UNIQUE ENVIRONMENTS, AND MISSIONS

Chapter 7	**IPB FOR SPECIFIC OPERATIONS**	**7-1**
	IPB Considerations for Offensive Tasks/*Operations*	7-1
	IPB Considerations for Defensive Tasks/*Operations*	7-4
	IPB Considerations for Counterinsurgency Operations and Stability Tasks	7-6
	Understanding the Population	7-19
Chapter 8	**IPB CONSIDERATIONS FOR UNIQUE ACTIVITIES, TASKS, AND PROCESSES**	**8-1**
	IPB Support to Protection/*Force Protection*	8-1
	IPB Support to Building Partnership Capacity/*Establishing Genuine Partnerships*	8-4
Chapter 9	**IPB CONSIDERATIONS FOR UNIQUE ENVIRONMENTS**	**9-1**
	IPB Considerations for an Urban Environment	9-1
	IPB Considerations for a Cold Weather or Mountain Environment	9-2
	IPB Considerations for a Jungle Environment	9-6
	IPB Considerations for a Desert Environment	9-8
	IPB Support to Cyber Electromagnetic Activities/*Cyberspace Operations*	9-12
Chapter 10	**IPB CONSIDERATIONS FOR UNIQUE MISSIONS**	**10-1**
	Conducting IPB in Support of Counterdrug Activities	10-1
	IPB Support to Counter-Proliferation	10-3
	IPB Support to Counter-Improvised Explosive Device Operations	10-4
	IPB Support to Site Exploitation and/or Exploitation of Sensitive Sites	10-4
	IPB Support to Peace Operations	10-6
	IPB Support to Humanitarian and Disaster Relief and Other Operations	10-9

Figure 10. Intelligence Preparation of the Battlespace Publication Table of Contents. Headquarters, Department of the Army and Headquarters, United States Marine Corps MCRP 2-10B.1 Intelligence Preparation of the Battlespace, iii.

6.B.4. Plan for the Revitalization of Marine Corps Intelligence

For Marine intelligence, the Service’s eventual solution to address the many problems identified following Operations DESERT SHIELD/DESERT STORM was “The Plan for the Revitalization of Marine Corps Intelligence” (commonly called the ‘Van Riper Plan’). Despite implementation a quarter century ago, it remains important to understand the plan, how it came about, and how it was scoped.

Many intelligence Marines today make assumptions about the context within which the plan took place, its intended scope, and how much was actually implemented and how quickly.

These assumptions, some of them mistaken, continue to shade how intelligence Marines approach current problems in Marine Corps intelligence. For example, the recommendation that Marine intelligence officers remain in their initial specialty longer or return to it more reliably (after a broadening tour), is frequently met with counterarguments asserting that the Van Riper Plan instituted specialization on only a limited basis for lieutenants (i.e., 0203/4/6/7s). In fact, the plan originally did envision a regular mid-career (i.e., at the rank of major) return to an officer's original specialization.

Following a relatively public investigation of intelligence shortfalls during Operations DESERT SHIELD/DESERT STORM that included multiple Services, the Combatant Commands (CCMD), and combat support agencies, the Senate Armed Services Committee (SASC) directed the Marine Corps to submit a plan for improving its intelligence capabilities.[304] Fortunately, the Marine Corps had already initiated a self-examination of intelligence during the operations on 1 March 1991, the day after the ceasefire. Conducted by career intelligence officers, the study concluded:

> (1) Intelligence support to I MEF during Desert Storm adequately supported the MEF staff but did not fulfill the needs of tactical units (division and below) in a timely manner.
> (2) Imagery support was inadequate.
> (3) Processing and dissemination of combat information and all source intelligence of immediate tactical value were inadequate.[305]

The study concluded that these shortfalls were primarily caused by "insufficient personnel and physical resources, and constraints imposed by operating in a joint environment."[306]

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[304] Ronald J. Buikema, "Integration of Intelligence into Professional Military Education" (master's thesis, United States Marine Corps Command and Staff College, 1996), 9.
[305] Coia, 27-28.
[306] Ibid., 28.

The Service used these results to develop the SASC-directed plan, focusing primarily on the acquisition of new equipment and systems to fix what this initial study concluded were the cause of the shortfalls.[307] An approach largely limited to seeking additional funding for new systems "*was not what the Senate had in mind*" and the Service was asked to develop an alternative approach that would address what was perceived by SASC staffers (almost certainly informed by the professional debates flaring up in the *Marine Corps Gazette*) as the institutional roots of the problems: force structure and training of intelligence Marines.[308]

The failure of this self-analysis in appeasing the SASC's tasking led the CMC to request that the DOD Inspector General (IG) evaluate Marine Corps intelligence with an outsider's perspective and in the context of the other Services' performance in intelligence. The report, issued on 24 September 1993, identified six deficiencies:

> (1) Inadequate doctrinal foundation;
> (2) shortcomings with the intelligence occupational field;
> (3) insufficient tactical intelligence support;
> (4) insufficient joint manning;
> (5) insufficient language capability;
> (6) inadequate imagery capability.[309]

The CMC, wasting no time, had already appointed the new Assistant Chief of Staff Command, Control, Communications, Computers, and Intelligence (C4I), newly-promoted Major General Van Riper, to address the IG report's findings. Major General Van Riper created a four-Marine "Process Action Team" and issued them initial guidance on 3 July 1993, charging them to

> (1) assess Marine Corps Intelligence in light of the post Desert Shield/Desert Storm environment, (2) initiate an Intelligence Study Group (ISG) comprised of officers from

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[307] Buikema, 9.
[308] Ibid.
[309] Beau Higgins, "An Analysis of Marine Corps Intelligence - Today and Tomorrow" (master's thesis, United States Air Force Air War College, 2009), 6.

throughout the Fleet Marine Force (primarily non-intelligence officers) to identify intelligence deficiencies in structure, training, and doctrine, and (3) draft a Concept of Intelligence to Support Expeditionary Operations, serving as the cornerstone publication for a doctrinal basis.[310]

This four-Marine team identified three root causes of the six deficiencies:

(a) The officer accession policy. Until fiscal year 1992, unrestricted officers had to serve in another military occupational specialty (MOS) prior to being assigned to the intelligence field (with few exceptions). This led to a number of officers considered not competitive by their first MOS being permitted to laterally move into the intelligence field.
(b) Separate intelligence "disciplines." These disciplines, normally described as human intelligence/counterintelligence, imagery intelligence, signals intelligence/electronic warfare, and general military intelligence/all others, led to a "stovepipe" mentality, where there was little regard for any of the disciplines one was not familiar with.
(c) Training. Formal intelligence training was failing to teach our future intelligence officers and enlisted Marines what they needed to know. For the officers, one 14 week course as a Second Lieutenant would possibly be the only formal intelligence training they would receive in a 20 year career, lagging a full 20 weeks behind the DOD average for the other services.[311]

Fortunately, the ISGs, comprised of every major occupational field, recognized that the shortfalls in intelligence were "a Marine Corps problem, not just a problem for the intelligence field."[312]

When the full plan was developed, it was briefed at the Executive Steering Group ("a panel comprised of every lieutenant general serving with the Marines Corps, plus the chair, the Assistant Commandant of the Marine Corps") on 2 March 1994, and approved for implementation.[313] (The shorter and more widely-read message outlining the plan, All Marine Corps Activities [ALMAR] message 100/95, was released on 24 March 1995.) The plan included

[310] Buikema, 7.
[311] Ibid., 12.
[312] Ibid., 13.
[313] Assistant Chief of Staff or Command, Control, Communications, Computer and Intelligence, *The Future of Marine Corps Intelligence* (Washington, D.C.: Headquarters, United States Marine Corps, 1994), 1.

two elements: the “[articulation of] the Marine Corps’ redefined approach to intelligence” and “[promulgation of] the plan for making this approach a reality,” together, representing a concept for intelligence support to the Marine Corps.[314]

The plan established a mission statement for Marine Corps intelligence: “Provide commanders, at every level, with tailored, timely, minimum essential intelligence and ensure that this intelligence is integrated into the operational planning process.”[315] And it established seven intelligence principles:

- The Focus is Tactical Intelligence
- Intelligence Focus Must be Downward
- Intelligence Must Drive Operations
- The Intelligence Effort Must be Directed and Managed by a Multi-discipline Trained and Experienced Intelligence Officer
- Intelligence Staffs Use Intelligence; Intelligence Organizations Produce Intelligence
- The Intelligence Product Must be Timely and Tailored to Both the Unit and its Mission
- The Last Step in the Intelligence Cycle is Utilization; Not Dissemination[316]

Taken together, the mission statement and the principles serve as the redefined approach to intelligence and the core of a concept for how intelligence supports a MAGTF. The plan for making this approach a reality involved a series of discrete capability requirements and actions (each with a series of subordinate elements):

- Develop Intelligence Doctrine
- Correct Shortcomings Within the Occupational Field
- Increase Tactical Intelligence Support
- Increase Joint Manning
- Improve Foreign Language Capability[317]

[314] Ibid., Enclosure (1), 1.
[315] Ibid., Enclosure (1), 2.
[316] Ibid., Enclosure (1), 2-4.
[317] Ibid., Enclosure (1), 4-7.

The most significant changes the plan made were in correcting OccFld shortcomings. Within this requirement, the plan focused on professionalizing the intelligence officer corps. To that end, it created an MOS structure (and corresponding force structure) that specialized intelligence officers as lieutenants and then generalized them as captains and above.

The plan did this by creating four entry-level intelligence officer Primary Military Occupational Specialties (PMOS). 0275 was established as the PMOS for 'Aviation Intelligence Officer' (later changed to 0207 Air Intelligence Officer). 0207s serve as the functional experts within the ACE for intelligence supporting the six functions of Marine aviation.[318] This MOS was unique among the specialties created by the Van Riper Plan because "it had no parallels from the past."[319] While there were Signals Intelligence/Electronic Warfare (SI/EW) and Counterintelligence/Human Intelligence (CI/HUMINT) communities before the Van Riper Plan and the ground intelligence community had strong foundations in the entrenchment of MAGTF intelligence in ground operations, air intelligence was new. While Captain Hathaway's article from 1968 shows that there were *some* parallels in the past, it is clear these had at least been sufficiently forgotten by the time the Van Riper Plan was developed (another reminder of the field's neglect).

0202 was established as the PMOS for 'MAGTF Intelligence Officer.' 0202s serve as the planners and integrators within the MAGTF for all intelligence disciplines. The logic behind this MOS was that the 0202 would have subordinate lieutenants in the respective functional roles. As long as the 0202 is trained to understand the capabilities and limitations of each discipline and

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[318] Commandant of the Marine Corps, *NAVMC 1200.1D Military Occupational Specialty* Manual (Washington, D.C.: Headquarters, United States Marine Corps, May 10, 2018), Enclosure (1), 1-12.
[319] Higgins, 26.

properly leverage their functionally-trained lieutenants, they need only ensure the combined intelligence effort is properly managed and integrated.

When intelligence lieutenants are selected to captain, they become eligible to attend MIOC, the course which grants them the 0202 MOS. Upon graduation from MIOC, the Marine receives the new PMOS 0202 and their entry-level MOS becomes an Additional Military Occupational Specialty (AMOS). Thus, entry-level intelligence officer MOSs are often called 'feeder' MOSs as they 'feed' into 0202.

Because the Van Riper Plan also codified this MOS change in force structure, there are no captain billets coded for feeder MOSs. Thus, from a manpower management perspective, every 02xx captain is assigned as an 0202, regardless of whether they have attended MIOC and received the 0202 MOS yet or not.

There were also some related aspects of the plan that were never implemented. For example, while the 0202 MOS was created to avoid stovepiping Marines in one field, there was recognition that some billets would require the formal training and expertise of a specific field; thus, it was intended that "Many billets will be footnoted to require a secondary military occupational specialty (MOS), for example a regimental S-2 will be a major 0202/0203 and an aviation group S-2 will be a major 0202/0207."[320] But this was never implemented.[321]

The Van Riper Plan also increased the total number of intelligence Marines. In 1994, there were 478 intelligence officers and 2,642 enlisted intelligence Marines; by 2011, these figures had grown to 1,050 and 5,170, respectively, an increase of 120% and 96%.[322] While these figures across the force are sizable, they resulted in only marginal increases in the number of

[320] C4I Staff, Headquarters, United States Marine Corps, "The Future of Marine Corps Intelligence," *Marine Corps Gazette*, April 1995, 28.

[321] Today, none of the 734 0202 billets in the Service have a BMOS or ASD of 0203/4/6/7.

[322] Paul et al., 20.

intelligence Marines at individual tactical units. Table 7 depicts the proposed increase in unit T/Os for intelligence Marines (including the 02 and 26 OccFlds but excluding the 68 OccFld).

Table 7. Van Riper Plan Intelligence Marine T/O Increase

		Pre-Van Riper Plan Structure			Van Riper Plan Proposed Structure		
	Unit	**Officer**	**Warrant Officer**	**Enlisted**	**Officer**	**Warrant Officer**	**Enlisted**
GCE Unit	Division	8	2	20	8	0 (-2)	19 (-1)
	Infantry Regiment	2	0	4	4 (+2)	0	8 (-4)
	Artillery Regiment	1	0	2	2 (+1)	0	5 (+3)
	Infantry Battalion	1	0	3	2 (+1)	0	3
	LAR Battalion	1	0	3	2 (+1)	0	3
	Artillery Battalion	1	0	2	1	0	2
ACE Units	Wing	7	1	19	7	0 (-1)	19
	Group	5	0	5	6 (+1)	0	8 (+3)
	Squadron	0	0	2	0	0	2

Source: Assistant Chief of Staff or Command, Control, Communications, Computer and Intelligence, The Future of Marine Corps Intelligence, 12.

6.B.5. Navy Intelligence Officer Basic Course

The Van Riper Plan initially identified a training solution for new 0207s at the nineteen-week Navy Intelligence Officer Basic Course (NIOBC) in Dam Neck, Virginia. Understandably, the course was not entirely suited to the needs of Marine air intelligence, with course material tailored to a variety of Naval intelligence specialties that included non-air intelligence disciplines. However, even those areas focused on air intelligence were more suited to maritime ISR, antisubmarine warfare, or carrier air wing operations. NIOBC was

> primarily focused on understanding the intelligence community and how the Navy is supported during maritime operations. The curriculum is locked into an operational-to-strategic understanding of geopolitical events and national-to-operational level understanding of the intelligence support apparatus. Where this course does delve into the tactical level, the focus is on support of fixed-wing aviation units that deploy with carrier battle groups. NIOBC offers no course material in support of tactical-level operations and no course material designed to teach intelligence support to rotary-wing operations.[323]

[323] Donovan J. Salerno, "Rebuilding the 0207 Aviation Intelligence Officer," *Marine Corps Gazette*, February 2009, 25.

The result was that Marine air intelligence officers arrived at their squadrons nineteen weeks later, little better prepared to support their units than before their MOS school. "The lack of proficiency in 0207s was widespread enough that it often led to the need for a squadron commander to assign an aviator as the S-2 officer and the 0207s as his assistant."[324]

In 1999, the Navy adopted a 'core and strand' model to better tailor education to students' future assignments.[325] This broke out the previously monolithic course into 'core' training, common to all Navy intelligence assignments, and 'strand' training, specific to select categories of assignments. "Under this concept, the Marine Corps established a Marine Corps Aviation 'strand' [totaling] 10.5 days of the 19-week course."[326]

This Marine strand stood to improve the value of the course to 0207s, though the arrangement continued to be less than ideal. All four entry-level intelligence officer schools were separated from one another, disintegrating what were intended to be complimentary MOSs functioning together within the MAGTF. Furthermore, these schools were run by other Services, involuntarily lengthening them to cover the parent Service's requirements. This denied or minimized the MAGTF-specific training these lieutenants would otherwise receive, reduced how long they would be available in the OPFOR with needlessly-long schools, and required the instruction and evaluation of sister Service-specific knowledge that was not relevant to their duties.

NIOBC, then, was only a modest step forward.

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[324] Ibid.

[325] Philip D. Gentile, "A Review of Marine Corps Intelligence Officer Training" (master's thesis, United States Marine Corps Command and Staff College, 2000), 15.

[326] Ibid.

6.B.6. Intelligence Weapons and Tactics Instructor Military Occupational Specialty

NIOBC's production of only marginally-qualified air intelligence officers was almost immediately apparent. Intelligence officers at MAWTS-1, dissatisfied with this training solution, quickly found a limited ability to address this shortfall through the training opportunities during the WTI course.

Since the inception of MAWTS-1, it has had an Intelligence Department. However, this "was limited to aircrew debriefs and map distribution" and only since the mid-1990s has it "evolved from primitive intelligence support to emphasizing more advanced aviation intelligence methods, training, and instruction" (when the *S-2* took on academic responsibilities and became the *Intelligence Department*).[327] While the first mentions of an embedded intelligence course at WTI date back to 1996, at the time intelligence students did not receive the 0277 MOS upon graduation.[328] (The Assault Support MAA first recommended intelligence personnel attend the WTI course and receive the 0277 MOS, although the context of the report is ambiguous as to whether the MAA was recommending that pilots with the collateral duty of intelligence or Marines in the intelligence OccFld attend the course.)[329] Because TECOM funds attendance at formal courses ("A school which satisfies Marine Corps-wide training and education requirements," normally interpreted to mean one that grants an MOS), before the existence of the 0277 MOS, intelligence students had to rely on unit funding to attend the WTI course.[330]

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[327] Marine Aviation Weapons and Tactics Squadron One Intelligence Department Head, *Air Intelligence Doctrine Working Group, 26-27 Jan* (Marine Corps Air Station Yuma, AZ: MAWTS-1, February 8, 2016), 1. Because MAWTS-1 has never formally had any mission relating to intelligence (e.g., creating intelligence WTIs or performing fleet support visits for air intelligence training programs), its Intelligence Department's role has never formally been defined.

[328] Niblock et al., 19.

[329] Marine Corps Combat Development Command, *Marine Corps Mission Area Analysis MA-33: Assault Support* (Quantico, VA: Marine Corps Combat Development Command, November 1991), 24.

[330] Commandant of the Marine Corps, *MCO 1553.1B The Marine Corps Training and Education System* (Washington, D.C.: Headquarters, United States Marine Corps, May 24, 1991), Enclosure (3), 3; Commandant of

Thus, as a way to both recognize the rigors of the course (which, at the time, was the only Marine Corps course in air intelligence) and to facilitate funding for intelligence Marines, air intelligence advocates were able to secure the creation of the 0277 MOS, "Weapons and Tactics Instructor (WTI) Intelligence Marine." 0277s serve as

> subject matter experts on the tactical employment of threat weapon systems … develop and execute individual T&R training and collective operational unit training … Serve as the unit SME [Subject Matter Expert] for intelligence support to mission planning, briefing/debriefing, threat systems and unit weapons system employment … recommend to unit commanders qualified intelligence personnel for nomination to the WTI Course … [and] instruct on current enemy capabilities and tactics to counter the threat.[331]

Normally an MOS is created when requirements for certain skills that do not exist are identified (Captain Hathaway's call for an air intelligence officer MOS in 1968 provides a model for this). 0277 was created backwards, however, with no unique requirement identified. The WTI course served to provide its intelligence graduates with the skills (and therefore credibility) they were unable to achieve through NIOBC. But the difference between 0207 NIOBC graduates and 0277s, while non-existent on paper, existed in practice until the creation of AIOC, when such differences were significantly reduced (this is discussed more later).

This reversal of the normal process had a serious consequence for the MOS: it was not linked with validated Service requirements. With no charge to execute the WTTP (and a T&R manual that has never had any 2000-level MOJT events), nothing in the T&R manual that required 0277s, no 0277 T&R events, and no formal requirements for attending the WTI course (especially none linked to training completion), it was an institutionally-meaningless MOS. The presence or absence of an 0277 had no measurable effect on any unit's ability to do anything.

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the Marine Corps, *MARADMIN 575/15 TECOM Formal Schools Travel Support (FSTS) Program Guidance* (Washington, D.C.: Headquarters, United States Marine Corps, November 17, 2015).

[331] Commandant of the Marine Corps, *NAVMC 1200.1D Military Occupational Specialty* Manual, Enclosure (1), 3-19.

Its informal potential, in the form of an 'Intelligence WTI course alumni network,' was also neutered by the manpower management of intelligence officers and the OPFOR's use of 0277s only as highly-trained 0207s. From a manpower management perspective, an 0207 is considered an 0202 upon selection to captain (approximately one year into their time as a first lieutenant and only three years after commissioning, usually a year before executing Permanent Change of Station [PCS] orders) and 0202s are considered identical regardless of their feeder MOS. The result is that a first lieutenant 0277 has only a year or so of 'use' before they are likely to depart the wing (at which point their 0277 MOS ceases to be of value to Marine aviation). Junior enlisted Marines often have a similar timeline. When coupled with the fact that OPFOR units seek to deploy these 0277s as the primary way of capitalizing on their expertise (as opposed to using them as instructors or training program managers), many of these 0277s are deployed or preparing to deploy during their tenure as an 0277 and therefore unable to have much influence on the intelligence Marines at higher, adjacent, or subordinate units. This shortens the tenure of most 'Intelligence WTI course alumni' to a matter of months.

This has remained a problem for 0277s for two decades.

6.B.7. The First Intelligence Training and Readiness Manual

As the decade progressed and the U.S. sought the promised 'peace dividend' following the end of the Cold War, virtually every element of the DOD sought efficiencies to maintain capabilities and readiness with fewer resources in response to declining budgets. Within the Marine Corps, the Service-wide adoption of Marine aviation's T&R program was one of these efforts.

Ground-side T&R manuals stemmed from MCCDC's *Training Readiness Needs Analysis Report*, issued in 1994. This report sought to "analyze current USMC training and education functions; determine potential business process improvement initiatives that will improve training readiness reporting; and develop a feasible business process alternative for providing the most efficient and effective training and education assessment structure."[332]

The report found that "*Training readiness* is not defined in Service publications," recommending the Marine Corps

> adopt the following definition of training readiness as a first step in improving training readiness assessment: "*an objective, standards based measure, coupled with the assessment of commanders, of the ability of an individual or unit to perform the required skills and collective tasks which will produce units that can fight and win on today's battlefield.*"[333]

The report also recommended that the Service "adopt a standardized approach to assessing training readiness based on [Combatant Commander (CCDR)] and MAGTF warfighting requirements, doctrine, mission essential tasks, and mission performance standards."[334]

Eventually, the shortfalls identified in the report would be more fully addressed, across the Joint Force, by the implementation of Defense Readiness Reporting System (DRRS) over a decade later. But the more immediate result of these findings was the adoption, by the ground side of the Service, of the T&R program used by Marine aviation since the 1960s.

At the time, prior to ground T&R manuals, the Marine Corps relied on Individual Training Standards (ITS) to define training requirements and develop training plans for Marines across OccFlds, MOSs, and billets.[335] While the construction of an ITS event is almost

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[332] Marine Corps Combat Development Command, Training & Education Division, *Training Readiness Needs Analysis Report* (Quantico, VA: United Sates Marine Corps Combat Development Command, January 4, 1994), ii.

[333] Ibid., 4-1, iv.

[334] Marine Corps Combat Development Command, Training & Education Division, *Training Readiness Needs Analysis Report*, iv.

[335] Commandant of the Marine Corps, *MCO 1510.101A Individual Training Standards (ITS) System for Marine Corps Special Skills - Volume 2* (Washington, D.C.: Headquarters, United States Marine Corps, September 12, 1997), 1.

indistinguishable from that of events in the Ground T&R Program today, the critical difference in the ITS system was the identification of training requirements for all Marines in a unit to enable a unit commander to evaluate the training readiness of his or her unit based on that aggregate training requirement.[336] (This differs from the Ground T&R Program by explicitly considering the training readiness of support MOSs whose skills do not directly support a unit's METs [i.e., external outputs] but rather indirectly support those METs with internal staff processes.)

Ground T&R manuals, developed from the Aviation T&R Program, began with a T&R manual for Tanks OccFld in 1995 and, throughout the remainder of the 1990s, expanded across the other ground OccFlds (of which the intelligence OccFld is considered one).[337] *MCO 3500.32 Intelligence Training and Readiness Manual*, was signed in 1999 "to publish revised training standards, regulations, and policies, which prescribe a career continuum of training."[338]

Chapter five of the 1999 manual is dedicated to Air Intelligence Officers (erroneously labeled with the MOS 0210) and is 129 pages long with 205 T&R events, 105 of which are specific to air intelligence (i.e., any event which specifies distinct knowledge of or integration into Marine aviation planning or a specific ACE element—excluding general intelligence functions that would be equally-applicable to GCE intelligence). The impressive number of events should be tempered by the fact that most would today be written either as a single performance step within a T&R event or identified as Knowledge, Skills, and Attitudes (KSA) that supports a performance step.

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[336] Ibid., Enclosure (2), 1.

[337] Commandant of the Marine Corps, *MCO P3500.72A Marine Corps Ground Training and Readiness (T&R) Manual* (Washington, D.C.: Headquarters, United States Marine Corps, April 18, 2005), 1.

[338] Commandant of the Marine Corps, *MCO 3500.32 Intelligence Training and Readiness Manual* (Washington, D.C.: Headquarters, United States Marine Corps, June 28, 1999), 1.

The contents of this manual appear to be a relatively robust training framework for air intelligence, implicitly requiring any subsequent reform efforts to explain why it disappeared (possible explanations are discussed below).

The manual's appendix A to chapter five enumerates the following Core Capabilities List for 0207s, which reads as follows:

1. Integrate air intelligence into the Intelligence Preparation of Battlespace (IPB) process.
2. Identify aviation intelligence requirements.
3. Develop the collection plan in support of aviation operations.
4. Direct the intelligence analytical effort supporting aviation operations.
5. Direct the fusion of all-source air intelligence.
6. Coordinate the integration of the intelligence system architecture into the Marine Air Command and Control System (MACCS).
7. Provide aviation intelligence to the common operating picture in an automated environment.
8. Develop the dissemination plan to provide timely and accurate intelligence.
9. Provide integrated aviation intelligence support to the staff planning process.
10. Provide intelligence through written and oral communications in an automated and non-automated environment.[339]

The manual provides four levels of training. The 100 level, or 'combat capable training,' "is designed to provide Marine Officers with the core skills necessary to function as the Air Intelligence Officer at the squadron, group and wing level."[340] The 200 level, or 'combat ready training,' "is designed to reinforce core skills and provide the core-plus skills that Aviation Intelligence Officers must possess to effectively assume billets that require specialized and/or additional training."[341] 300 level training is the conduct of MIOC (not specifically air intelligence, but programmed in as career progression). And 400-level training "is specialized training directed at section tasks that integrate core and core-plus skills acquired in level 100 and

[339] Ibid., Chapter 5, Appendix A, A-1.
[340] Ibid., Chapter 5, Appendix B, B-1.
[341] Ibid.

200 training."[342] Restated in more modern T&R terminology: 100-level events qualify an officer for the 0207 MOS and are trained at a formal entry-level school (then NIOBC), 200-level events are for specific billets that require additional follow-on instruction and are trained as MOJT, and 400-level events represent collective training for sections or unit subsections (also trained as MOJT). Figure 11 is an event characteristic of this manual.

Event code: 109-ANA

Task: Describe characteristics of foreign air defense guns.

Condition: Provided with the appropriate reference, materials, and equipment.

Standard: MCM 3-1, Threat Counter Measures Manual Threat Counter Measures Manual

Concept of task: None.

Prerequisites: None.

CRP: 0.0076 **Sustainment Interval (months):** 0

External Support Required: None.

Events updated: None.

Reference(s): MCM 3-1, Threat Counter Measures Manual, Threat Counter Measures Manual

Figure 11. Representative 0207 T&R Event from MCO 3500.32. Commandant of the Marine Corps, MCO 3500.32 Intelligence Training and Readiness Manual, Chapter 5, Appendix E, E-5.

The manual's appendix C to chapter five, *Billet Applicability*, cross-walks each of the 200-level T&R events to twelve identified billets (see Figure 12 for the first page of this matrixing). Some are applicable to all billets, but most billets vary with respect to the skills they require. This would have provided users of the Intelligence T&R Manual (both the instructor/evaluator and the Marine being trained) a clear guide for what training was necessary for a given billet and what a Marine's training level for that billet was. The manual's appendix D

[342] Commandant of the Marine Corps, *MCO 3500.32 Intelligence Training and Readiness Manual*, Chapter 5, Appendix B, B-1.

to chapter five, *Section Applicability* (see Figure 13 for an excerpt), offers the same matrixing of T&R events, but to eight identified sections, corresponding to the structure of an ACI.

INTEL T&R MANUAL

CHAPTER 5

APPENDIX C

BILLET APPLICABILITY

Billets and CRP totals

.1390	A	Intelligence Analysis Officer	N
.1390	B	Senior Analyst	O
.0554	C	Collections Officer	P
.0898	D	Target Intelligence Officer	Q
.0747	E	Target Development officer	R
.0812	F	Target Validation Officer	S
.0598	G	Battle Damage Assessment Officer	T
.0555	H	Requirements and Dissemination Office	U
.0320	I	Intelligence Systems officer	V
.1026	J	Current Operations Watch Officer	W
.0748	K	Future Operations Watch Officer	X
.0940	L	Flightline Intelligence Center Watch	Y
	M		Z

Event code	CRP	(mo) S/I	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z
200-ANA	0.0064	1	X	X								X		X														
201-COX	0.0021	1			X																							
202-SYS	0.0064	.5	X	X	X	X	X	X	X	X	X	X	X	X														
203-COX	0.0021	3			X																							
204-RFI	0.0043	.5	X	X						X																		
205-ANA	0.0043	3	X	X		X	X	X	X	X		X	X	X														

Figure 12. Representative T&R Event-to-Billet Matrixing. Commandant of the Marine Corps, MCO 3500.32 Intelligence Training and Readiness Manual, Chapter 5, Appendix C, C-1.

The focus on ACI billets is understandable given the lack of 0207 structure at squadrons and the fact that Marine aviation doctrine does not provide for distinct doctrinal employments of the group and wing echelons. Aviation doctrine articulates only one clear model for ACE employment—the MAW (with an ACI as described in the TACC Handbook).[343] Service doctrine does not provide a distinct model for MAG employment, implying that MAGs, without a MAW

[343] Headquarters, United States Marine Corps, *MCWP 3-20 Aviation Operations*, 2-6.

echelon above them, operate in the same manner as a MAW, simply with fewer personnel and resources (and therefore reduced capacity and potentially reduced capability).

INTEL T&R MANUAL

CHAPTER 5

APPENDIX D

SECTION APPLICABILITY

Sections and CRP totals

.0500	1	Intel Systems Section	14
.3000	2	Intel Collections Section	15
.8875	3	Intel Analysis Section	16
.6000	4	Target Intel Section	17
.5875	5	Flightline Intel Center	18
.1375	6	Requirements and Disseminations Secti	19
.7250	7	Current Operations Intel Watch Sectio	20
.6625	8	Future Operations Intel Watch Section	21
	9		22
	10		23
	11		24
	12		25
	13		26

Event code	CRP	(mo) S/I	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26
400-ANA	0.025	3			X																							
401-ANA	0.025	.5		X	X	X	X	X	X	X																		
402-COL	0.025	3		X																								
403-ANA	0.05	3		X	X		X		X	X																		
404-ANA	0.025	.5			X			X																				
405-DIS	0.025	3	X		x		x		x	X																		

393

Figure 13. Representative T&R Event-to-Section Matrixing. Commandant of the Marine Corps, MCO 3500.32 Intelligence Training and Readiness Manual, Chapter 5, Appendix D, D-1.

Thus, it is reasonable to conclude the 1999 Intelligence T&R Manual is designed to train 0207s whose primary job will be to operate an ACI, either at a MAW or MAG echelon. This relatively limited articulation of ACE modes of employment reduces, somewhat, air intelligence's ability to effectively support an ACE developing as a maneuver element. Maneuver elements require more decentralized intelligence organic to the lowest echelons (i.e., squadrons) so a model that only discusses air intelligence at the highest echelons—the ACI within a MAW TACC—leaves gaps.

This ACI-only focus underscores the importance of an air intelligence concept and serves as a concrete example of the gaps that resulted from the lack of such a concept. When, in the 2000s and 2010s, Marine air intelligence leaders began pushing more capacity down to the squadrons, this T&R manual would have been somewhat less useful as the intelligence responsibilities at the squadron differ from those at an ACI.

Another problem that limited the utility of this manual is the lack of a professional body of knowledge for air intelligence. This documentation, had it existed, would have served as references to these events that would have supported the development of detailed training plans. Most T&R events in the manual's chapter five list operations publications (e.g., articulating Marine aviation operations) or general intelligence publications (e.g., those addressing intelligence collections processes). Some events reference *Multi-Command Manual (MCM) 3-1 Threat Counter Measures Manual* (now the *Air Force Tactics, Techniques, and Procedures [AFTTP] 3-1.Threat Guide*) and *Jane's Threat Systems Volume*, and while these provide good encyclopedic intelligence information, they lack a description of *how* to do intelligence support to ACE operations. Some events also reference *FMFM 3-27 Aviation Intelligence*, which was of course never published. Finally, some events reference the *Marine Aviation Weapons and Tactics Squadron Academic Support Package*. The nature of this package is not clear; however, by the 2000s, aviation and aviation ground MOSs were using course material, provided by MAWTS-1, to instruct MOJT training in OPFOR units. It is possible that MAWTS-1's Intelligence Department made available, as a part of this package, course material developed for the then-nascent 0277 course at WTI. Depending on the availability of this material (i.e., through electronic or other means), it is possible those attempting to execute portions of this T&R manual would have had limited course material to facilitate training.

The first Intelligence T&R Manual, then, seems to provide a relatively robust framework for training air intelligence Marines, albeit with a heavier focus on the role of intelligence at higher echelons. It certainly required refinement, but its beginnings seemed promising. One must then ask: why did air intelligence training fall into a state of disrepair in the following years?

The adoption of a formal Ground T&R Program and the issuance of the second Intelligence T&R Manual (both discussed below) provide clues as to why such detail and specificity with respect to air intelligence was abandoned. And the force structure issues identified in the creation of the WISC may help explain why such specificity and detail was difficult to ever achieve in the first place (also discussed later in this chapter).

6.B.8. 1990s Summary

While the intelligence officers responding to Brigadier General Van Riper between 1991 and 1993 identified a number of potential solutions to the problems from Operations DESERT SHIELD/DESERT STORM, few identified comprehensive and coherent concepts that would lead to institutional solutions and address systemic problems. It took Major General Van Riper, an outsider, to lead efforts to change intelligence officer training, career path, and force structure.

Precisely why Marine intelligence required an outsider to fix it is a difficult question to answer. Perhaps such a major change required a general officer to lead it and there were simply not yet any general officers from intelligence OccFld. Or perhaps the Marine Corps does not culturally value intelligence officers and thus finds it difficult to take seriously their self-directed abilities to bring about institutional change. Or perhaps intelligence officers, as insiders, cannot see the forest for the trees. Whatever the reason, when some in the intelligence field expressed concern that non-intelligence officers were determining the future course of Marine Corps intelligence, others pointed out that "with years of opportunity to fix itself, from the SRIG to Congressional plus-ups for training, from numerous studies to the Intelligence Roadmap itself, [the Marine Corps intelligence community] had not fixed the problem."[344]

This transformative time for Marine Corps intelligence as a whole should have had positive ramifications for air intelligence. It should have increased the emphasis on intelligence support to maneuver elements and translated into improved capability with respect to air intelligence, all tied together with a coherent concept. But, for a number of reasons, it did not. This problem of how the Marine Corps conceived of aviation and how it then conceived of air intelligence (if it gave any thought to it at all) is not abstract. In 1992, the Deputy Director of the Marine Corps Intelligence Center (which would later be renamed MCIA), penned an entire *Marine Corps Gazette* article specifically about the shortfalls of ACE intelligence. However, he spends the first third questioning whether the operational and planning processes of Marine aviation (e.g., the Air Tasking Order [ATO] cycle) are capable of supporting the MAGTF at all, and the second two thirds of the article conflating air reconnaissance capabilities with intelligence support to aviation operations (failing to recognize that the latter exists).[345] This inability to articulate the differences in air intelligence is also seen the Van Riper Plan itself, which articulates differences in T/O increases (see Table 7) across a variety of types *and* echelons of ground units (e.g., both between artillery and infantry units as well as battalions/batteries and regiments) but only distinguishes between *echelons* of aviation units, as though every squadron were the same. (The air reconnaissance capabilities of the FA-18D and the Electronic Warfare [EW] capabilities of the EA-6B alone were adequate reasons to

[344] Buikema, 14-15.
[345] Bruce E. Brunn, "Maneuvering Blind," *Marine Corps Gazette*, October 1992, 81.

differentiate T/O increases across different types of squadrons. Differentiation among squadrons in the intelligence support required is discussed in greater detail in Appendix I.)

Thus, at the very point when the Marine Corps intelligence community was soul-searching and preparing to undergo serious reforms, even its intelligence leadership questioned the value of the ACE as a maneuver element and failed to distinguish between air reconnaissance and air intelligence. An analogy might be if the ground intelligence community failed to distinguish between the responsibilities of scout sniper platoon commanders and battalion S-2s. Such ignorance would be mocked—and yet in air intelligence, such ignorance has remained common, even today.

For the Marine Corps intelligence community, the 1990s presented a crisis of credibility. Colonel Michael Ennis (who would become the Service's first intelligence officer DIRINT in 2001) wrote at the close of the decade, "Because problems of credibility invariably stem from a prolonged or consistent failure to meet expectations, the first step in solving these problems is to understand what those expectations are."[346] The Service reforms that took place in the 1990s largely closed this credibility gap by 1999 (with the successes conclusively demonstrated during the wars in Afghanistan and Iraq). But one area where the credibility gap continued to exist was air intelligence, where it would take at least another decade to make measurable progress. In aviation, "widespread ignorance of an S-2 section's primary functions" remained common and "commanders and operators [continued] either to ignore or misuse their intelligence personnel."[347]

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[346] Michael Ennis, "The Future of Intelligence," *Marine Corps Gazette*, October 1999, 46.
[347] Cartwright, 46.

6.C. 2000s: “Gone to fight the Indians. Be back when the war is over.”[348]

For air intelligence, the 2000s represented a decade of regression, with the one notable advancement (the creation of AIOC) complicating the utility of the 0277 MOS and further-encouraging the misuse of 0277s as top-tier 0207s rather than as instructors and training program managers. Additionally, TECOM would make ground T&R manuals next-to-useless for supporting MOSs.

Beginning in 2001, when attention began shifting to deploying forces to Iraq and Afghanistan, the Service pushed the previous focus on training to the side. The tantalizingly-short combat of Operations DESERT SHIELD/DESERT STORM, followed by a rapid resumption of a steady-state focus on training and readiness, were still relatively fresh in senior leaders’ minds. And with few predicting the length and sustained high operational tempo of Operations ENDURING FREEDOM and IRAQI FREEDOM, Service leaders might be excused for a myopic focus on combat operations that ended up undercutting the Service’s ability to sustain the requisite levels of training and readiness. The criticism that this was the decade when the Services forgot how to train for and fight peer and near-peer combat and truncated training in an effort to accelerate force generation is certain to spark debate for years to come. But the 36th CMC’s planning guidance and the 37th CMC’s Force 2025 efforts support this critique, generally, with Major Freshour’s work (discussed in Chapter 3 and later in this chapter) supporting it for air intelligence, specifically.

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[348] ‘Grand Old Man of the Marine Corps,’ Colonel Archibald Henderson, the fifth and longest-serving CMC, commanded the Marine Corps in the field during Second Seminole War in Florida in 1836. Apocryphally, he pinned a note to his door stating, “Gone to Florida to fight the Indians. Will be back when the war is over.”

6.C.1. The Creation of the Ground Training and Readiness Program

In the early 2000s, the Ground T&R Program began an evolutionary divergence from Aviation T&R Program, changing the form and function of events, the broader framework in which they were set, and the way in which the T&R manuals were to be written (i.e., in support of readiness reporting metrics ill-suited for support MOSs).

Within a few years of adopting the T&R manual as a mechanism for training, TECOM saw the necessity for a center of excellence to sustain the T&R manuals, act as OccFld training advocates, and ensure that T&R manuals represented both the most relevant training material and were tailored to effective use by the OPFOR.

Writing in 2002, imagining training and education five years in the future, the TECOM Chief of Staff envisioned that the entry-level schools would become centers of excellence, "modeled after Marine Aviation Weapons and Tactics Squadron 1, [and would] also take feedback from the Operating Forces through their participation in the 'advocacy' process for infusion of new requirements into the Marine Corps Combat Development Command (MCCDC) expeditionary force development cycle."[349] (The assumption that formal entry-level schools would be able to serve as centers of excellence, in the same way as MAWTS-1, is as worrying as it is misguided, especially coming from TECOM leadership. It is no surprise then, that the idea of entry-level schools as 'centers of excellence' never took hold in a way that meaningfully compares to MAWTS-1.)[350]

By 2005, TECOM saw the way forward as establishing a Ground T&R Program manual, formalizing what had been a largely community-led and community-specific approach to

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[349] Robert W. Strahan, "Training and Education–A Look Into the Future," *Marine Corps Gazette*, December 2002, 16.

[350] MAWTS-1's effectiveness as a center of excellence comes from it being a 'finishing' school for Marine aviation training providing instructor trainers and training program managers, not as an entry-level school

documenting training requirements. This formalized umbrella program sought to unify approaches to training and ensure they were prioritized and linked to readiness. The new program put at the fore CRP, "a numerical value assigned to certain collective T&R events that assists in the tracking of unit training readiness."[351] Consequently, the Ground T&R Program became myopic in its focus on operational MOSs and made the fundamental (and explicit) assumption that infantry training can be used as a template for designing effective training across all ground MOSs. Referring to *all* ground training, the program manual states: "Emphasis must be placed on the training of basic infantry skills. Skills like noise discipline, light discipline, and security must be trained with vigor. … As such, all events in the T&R manual should be conducted during the day and under conditions of limited visibility."[352] It should be self-evident how this assumption breaks down for many support MOS training activities.

Understanding this flawed assumption of the Ground T&R Program's designers, the idea that every ground T&R manual can and should revolve around CRP is understandable, even appealing. But the effect for intelligence sections (who, in executing an internal staff process, by definition can never contribute to MET readiness metrics and are therefore omitted from readiness evaluations like DRRS) was to neuter the T&R manual that had been around for seven years and to relegate future T&R manuals to near-irrelevance for the OPFOR. Because of this focus on CRP, the one exception to this would be intelligence *units*, where METs *can* be founded on intelligence T&R completion. These are few, and none conduct air intelligence.

[351] Commandant of the Marine Corps, *MCO P3500.72A Marine Corps Ground Training and Readiness (T&R) Manual*, 2.

[352] Ibid., 3.

The Ground T&R Program, then, is not a program designed for all ground MOSs, but rather one designed for ground unit readiness reporting (and thus, primarily for those MOSs and units where T&R event completion contributes to unit readiness reporting).[353]

As concerning, TECOM recognized "that most occupational fields could not develop or utilize a T&R manual that strictly adhered to the guidance provided in [the Ground T&R Program manual]." TECOM's curious solution was to make the program manual more tailored to infantry training. The program manual changed the level-coding framework from 100-400 to 1000-8000 "based on an infantry battalion or similar unit-based model," making CRP a factor in only E-coded events (which, for intelligence sections, is not relevant).[354]

The manual's "Philosophy of Training," articulated in its chapter one, created the notion that Marines receive an 'inoculation of training' at their entry-level schools and that OPFOR need only to sustain those skills, rather than to establish a persistent learning environment for Marines to continually improve and learn skills for positions beyond the rank of private or second lieutenant: "T&R Manuals define the core skills required of Marines in their respective MOS and are normally trained in entry-level formal courses or in Centers of Excellence."[355] The philosophy of training includes no discussion about continued learning after a Marine graduates from a formal course, only underlining that basic skills must be sustained and that collective events are merely the collective demonstration of these basic skills. Even the definition of "Core Plus Skills" states that MOJT skills are normally leadership-based (rather than billet- or unit-specific), are only necessary for a few select Marines, and are taught in a Marine's first tour (i.e.,

[353] It is worth noting that this is also largely true for aviation and aviation ground MOSs, under the Aviation T&R Program, however, the organization of Marine aviation units largely into functional MOS-based units mitigates this issue for the majority of aviation and aviation ground MOSs. The nature of many support MOSs as ground MOSs (e.g., administration, intelligence, logistics) tends to lay the problems at the feet of the Ground T&R Program, however.

[354] Ibid., 4-5.

[355] Ibid., 1-4.

through sergeant or first lieutenant). Captains or staff sergeants and above, it seems, have nothing left to learn. Nor are any MOSs expected to require any job-related skills not taught in a formal course.[356]

The manual makes clear, then, that there are no individual skills to learn after a Marine graduates from their MOS school, and they need only to sustain what they have learned and to demonstrate it in a variety of collective echelons (this manifests in individual event codes having only two levels, 1000- and 2000-level, with successive levels, from 3000 to 9000, only for increasing sizes of *collective* units).

By contrast, the Aviation T&R Program is founded on a training continuum, underscored by fact that individual events reach up into almost every level (through 6000-level) and with clear roadmaps for progression outlined for each MOS within the T&R manual itself.

The standards in the Ground T&R Manual are also not as objective as in aviation. For aviation, currency and proficiency are binary states—current or not current, proficient or not proficient—and MET readiness simply adds up these states for individuals across their required qualifications and the T&R events that make up those qualifications. On the ground side, a unit is evaluated as to whether it exhibited certain characteristics in an exercise so as to demonstrate its ability to conduct its mission in aggregate (without necessarily evaluating any individual's proficiency). And when individual T&R events are inspected, or a unit is evaluated by CRP, only a subset of those events (E-coded events) are considered in such an evaluation. "E-Coded collective events are the only events that contribute to a unit CRP. … MET CRP is calculated by

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[356] Core Plus Skills are defined as "those combat-focused skills that are environment, mission, rank, or billet specific and are developed after a Marine is assigned to an operational unit. Most Core plus skills are 2000-level events learned via MOJT and during unit training in a Marine's first operational tour. … Marines chosen to complete advanced individual training are those the commanding officer feels are capable of directing the actions of subordinates in combat." Commandant of the Marine Corps, *MCO P3500.72A Marine Corps Ground Training and Readiness (T&R) Manual*, 3-2.

adding the percentage of each completed and current (within sustainment interval) E-Coded training event."[357] The Ground T&R Program, therefore, is structured so that the conduct of air intelligence training is not measured and therefore is not relevant to a unit's readiness.

With this new T&R framework, focused on MET-readiness metrics and with the implication that the only individual learning necessary takes place at entry-level schools, it is no surprise that the second publication of the Intelligence T&R Manual, re-drafted in line with the new Ground T&R Program, was widely considered to have little utility for training in the OPFOR.

6.C.1.A. The Special Training Differential in Air Intelligence

It is worth pausing for an aside to discuss the special implications of inadequate training in air intelligence as compared to other fields. A poorly-constructed T&R manual hinders any population of Marines. But for air intelligence, the inadequacy of the T&R manual is especially damaging.

The significance of the T&R manual to air intelligence (and therefore the consequence of its deficiency) stems from the training differential (both in general training and in training regarding the threat) between air intelligence Marines and Marine aircrew. The average pilot undergoes nearly three years of flight training before ever arriving at his or her operational unit. Only then do they commence a career progression model that places them in a highly-structured, monitored, and resourced persistent learning environment for at least the next four years. During this time, many of their training events involve formal instruction on the air and air defense threat and if they become an instructor of these events, they are required to study them to the point of being able to teach them. For communities with an inherently offensive mission (e.g.,

[357] Commandant of the Marine Corps, *NAVMC 3500.100B Intelligence Training and Readiness Manual* (Washington, D.C.: Headquarters, United States Marine Corps, June 6, 2016), Enclosure (1), 1-13.

Marine Light Attack Helicopter Squadron [HMLA], Marine Attack Squadron [VMA], Marine Fighter Attack Squadron [VMFA]), the ‘blue’ component of their mission may explicitly overlap with the ‘red’ (i.e., developing and executing a tactical plan to strike an enemy target requires detailed integration of threat intelligence). Fixed-wing aircrew have an even more detailed understanding of fixed-wing threats due to the fact that their tactics must inherently counter enemy tactics and the ‘blue’ knowledge to execute friendly tactics (e.g., aerodynamics, energy-maneuverability theory, and air-to-air missile employment) provides these aircrew a leg up in understanding enemy tactics and estimating how an adversary will employ them.

This all creates a substantial training differential, whereby aircrew often have a good (sometimes comparable and sometimes better) understanding of the threat, without the assistance of the intelligence Marines (a threat knowledge differential where the intelligence Marine is at the disadvantage). This makes it challenging for intelligence Marines to achieve credibility and provide value to the planning process, with 0231s who undergo virtually no air intelligence training or, now, 0271s and 0207s who undergo only four-to-five weeks of specialized air intelligence training. This places greater importance on a continuum of training as compared to MOSs, such as infantry, where operations personnel are not required to closely study the threat or where the supported weapons systems are not highly technical (i.e., requiring years of training to operate). In these fields, operational personnel have a comparatively poor understanding of the threat (a high threat knowledge differential where the intelligence Marine is advantaged), meaning that most any intelligence Marine is value added to planning and execution.

Thus, a poorly-trained intelligence Marine at an infantry unit has a comparatively easier time providing value, and thus achieving a degree of credibility, than a poorly-trained intelligence Marine at an aviation unit.

6.C.2. The Second Intelligence Training and Readiness Manual

Following the development of a new, more standardized approach to ground T&R, existing T&R manuals were re-written in accordance with the new Ground T&R Program's training framework. For Marine intelligence, this revised manual, *NAVMC DIR 3500.101 Intelligence Training and Readiness Manual*, was published in 2006 and replaced the 1999 Intelligence T&R Manual (which was reissued in 2004).

The new manual's updated purpose emphasized readiness reporting associated with METs, consistent with the newly-introduced Ground T&R Program: "this T&R Manual establishes Core Capability Mission Essential Tasks (MET) for readiness reporting and required events for standardized training of Marines and Navy personnel assigned to perform intelligence functions."[358]

This focus on readiness *reporting* was due to the institution of DRRS, the new system to track unit readiness across the Joint Force. Shortly after DRRS was implemented, TECOM began to update T&R manuals "based on 'unit design' MET/METLs. Under the new Defense Readiness Reporting System …, commanders are required to report their readiness state based on their unit METL."[359] This effectively diverted the focus in T&R manuals from *training* to *readiness*. For operational communities (e.g., aviators, infantry), this change was a distinction without a difference: the training metrics in DRRS largely continued to measure unit readiness by operational training level, further formalizing processes already in place for these communities. Thus, if the operators were trained, the unit was deemed to be ready within the

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[358] Commandant of the Marine Corps, *NAVMC DIR 3500.101 Intelligence Training and Readiness Manual* (Washington, D.C.: Headquarters, United States Marine Corps, September 1, 2006), 1.

[359] Chief of Naval Operations et al., *MCO 3500.26A Universal Naval Task List* (Washington, D.C.: Chief of Naval Operations, Headquarters, United States Marine Corps, Headquarters, United States Coast Guard, January 30, 2007), 4-A-1.

training metrics. For non-operational or support communities (e.g., intelligence), the change neutered the T&R manuals. For these communities, training completion, by definition, did not factor into a unit's readiness metrics. In the intelligence field, specifically, it had the practical effect of turning the Intelligence T&R Manual into the Intelligence *Battalion* T&R Manual as Intelligence Battalions were now the only unit compelled to adhere to any element of the manual.[360]

The second-order effect of this change was that subsequent revisions to the Intelligence T&R Manual focused primarily on Intelligence Battalion needs (ground-centric and generalist events) and formal course events, the two places where the manual had to be closely followed. The effect for air intelligence was that the comprehensive training events (as well as matrices facilitating billet-based training plans) found in the 1999 manual were removed (and forgotten).

Understandably, having adopted the Aviation T&R Program as a model, the first ground T&R events were written with a similar lack of specificity as aviation T&R events. One of the reasons aviation T&R events lack a high degree of specificity is because there exists significant additional documentation (e.g., NATOPS, Navy Tactics, Techniques, and Procedures manuals [NTTP], and doctrinal publications) to provide the necessary details for instruction and evaluation, obviating the need to include this detail directly in a T&R event. For intelligence, generally, and air intelligence, specifically, analogous supporting publications often did not exist (with the exception of general intelligence doctrine). As a consequence, ground T&R manuals found it necessary to include additional detail in the events and alter event construction

[360] The other primary OPFOR intelligence units are Radio Battalions, who enjoy a customized "SIGINT T&R Manual," referred to colloquially as the "Radio Battalion T&R Manual" for the same reason. These tend be equally ignored by SIGINT Marines outside the Radio Battalion. Some Marine Expeditionary Force Information Groups (MIG) are developing METs that are or directly incorporate intelligence tasks. As both the MIGs and their METs are still developmental, they are not considered in this research.

accordingly. The similarities in event structure and detail between the first Intelligence T&R Manual (Figure 11, above) and the aviation T&R manuals (Figure 14) were altered and greater detail was added in the second Intelligence T&R Manual (Figure 15).

The problem with the second manual's focus on readiness is that it only directly impacts intelligence *units*. This is because a unit's METL "includes those tasks required to accomplish the multiple missions that are or may be assigned to a commander" and the METs comprising the METL are limited to a unit's external outputs, not internal staff processes (e.g., intelligence

SAAR-2431 1.0 * B NS S 1 FFS/FTD

Goal. Introduce night aided AAR.

Requirements.

Discuss

CRM during NVD AAR.
Comfort level.
Closure rates.
Depth perception.
Receiver/tanker lighting.
Visual illusions.
Inadvertent IMC.
Emergency procedures.
Visual signals.
Tanker sequence.

Introduce. NVD AAR.

Performance Standards

Demonstrate proper knowledge of night/NVD AAR procedures IAW the ANTTP and the ATP-56.
Recognize proper night/NVD visual reference points IAW the ANTTP.
Demonstrate proper closure rates
Demonstrate proper missed contact procedures

Instructor. AARI.

Prerequisites. SNS-2330, SAAR-2430.

Required Reading - ANTTP Ch 6, MAWTS-1 NVD Manual.

Figure 14. Representative 7532 T&R Event from NAVMC 3500.11E. Commandant of the Marine Corps, NAVMC 3500.11E MV-22B Training and Readiness Manual, 2-108 - 2-109.

0207-ANYS-1009: Provide tailored intelligence support to Marine aviation units

EVALUATION-CODED: NO **SUSTAINMENT INTERVAL**: 6 months

DESCRIPTION: Due to the specialized nature of aviation operations, and the knowledge base required for aviation intelligence, the Marine must have a thorough understanding of the pre and post flight intelligence tasks and aviation intelligence specific technologies necessary to support operations. The Marine must provide tailored intelligence support to air mission planning and focus on the specialized nature of aviation operations. However, each situation is unique. The types of products generated will vary based on the size of the unit, time available, intelligence requirements (IRs), and characteristics of the mission and AO.

GRADES: 2NDLT, 1STLT, CAPT

INITIAL TRAINING SETTING: FORMAL

CONDITION: Given a mission, commander's intent, brief and debrief formats.

STANDARD: In performance step sequence, within the time limits established by the commander.

PERFORMANCE STEPS:
1. Develop intelligence products in support of the six functions of Marine aviation.
2. Develop survival, evasion, resistance, and escape (SERE) and tactical recovery of aircraft and personnel (TRAP) target area intelligence.
3. Conduct pre-mission briefs.
4. Conduct post-mission debriefs.

REFERENCES:
1. MCDP 1-0 Marine Corps Operations
2. MCRP 2-3A Intelligence Preparation of the Battlefield
3. MCWP 2-1 Intelligence Operations
4. MCWP 2-3 MAGTF Intelligence Production and Analysis
5. MCWP 5-1 Marine Corps Planning Process

Figure 15. Representative 0207 T&R Event from NAVMC DIR 3500.101. Commandant of the Marine Corps, NAVMC DIR 3500.101 Intelligence Training and Readiness Manual, 7-10 - 7-11.

support).[361] This means that a non-intelligence unit (a VMM, for example) is evaluated in DRRS based on its METL, which is derived from the tasks/missions that will be assigned to its commander. As a non-intelligence unit will not receive intelligence tasks and missions, its

[361] Commandant of the Marine Corps, *MCO 3500.110 Policy and Guidance for Mission Essential Task List (METL) Development, Review, Approval, Publication and Maintenance* (Washington, D.C.: Headquarters, United States Marine Corps, July 15, 2011), B-1, A-1.

METL will not include intelligence METs. And, in turn, the intelligence section at that unit will not be evaluated on its completion of intelligence T&R events.

This nature of the publication as the 'Intelligence Battalion T&R Manual' becomes even more explicit in the fourth release, where the manual's chapter two explicitly lists the METL as that of Intelligence Battalion (whereas the 2006 manual does not specify the units whose METL is listed in its chapter two and the third edition omits chapter two, as a placeholder).[362]

The consequence of both the manual's refocusing on readiness reporting and the fact that only intelligence units have intelligence METs on their DRRS METL is that the T&R events were entirely revised and significantly generalized (consistent with Intelligence Battalions' more general mission as compared to specific-unit intelligence sections). Consequently, the second T&R manual abolishes almost all references to the ACE or MACCS, Marine aviation planning processes (e.g., the ATO cycle), and air and air defense threats.

The one exception to this is event "0207-ANYS-1009: Provide tailored intelligence support to Marine aviation units" (the only aviation-specific event of the twenty-one events for 0207s). The description of the event reads, in part:

> Due to the specialized nature of aviation operations, and the knowledge base required for aviation intelligence, the Marine must have a thorough understanding of the pre and post flight intelligence tasks and aviation intelligence specific technologies necessary to support operations. The Marine must provide tailored intelligence support to air mission planning and focus on the specialized nature of aviation operations.[363]

Disappointingly (for an event which is to include the totality of specialized intelligence support to half of the entire Service's maneuver force), there are only four performance steps and, of those four, only one has anything to do with aviation. Even more disappointingly, it is so

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[362] Commandant of the Marine Corps, *NAVMC 3500.100A Intelligence (Intel) Training and Readiness (T&R) Manual*, Enclosure (1), 2-1.

[363] Commandant of the Marine Corps, *NAVMC DIR 3500.101 Intelligence Training and Readiness Manual*, 7-10 - 7-11.

broad as to be of no utility: "Develop intelligence products in support of the six functions of Marine aviation."[364] The other steps include Survival, Evasion, Resistance, and Escape and TRAP intelligence support, pre-mission briefs, and post-mission briefs (skills required of *any* unit intelligence personnel).[365] Furthermore, despite the event description, which extols the specialized nature of aviation operations and specialized knowledge of aviation intelligence, none of the references have anything to do with either.

Additionally, no air and air defense references are to be found for events anywhere in the chapter, nor are any references to Marine aviation doctrinal publications that might provide 0207s with an understanding of the units and platforms they are training to support. The manual even erroneously directs 0207s to train to employ an intelligence section within a Combat Operations Center (COC), a ground C2 concept that is replaced by the TACC in aviation operations.[366]

The final problem with this document is that it only provides 1000-level events. The Ground T&R Program Manual defines these as core skills "trained in entry-level (1000-level) training. It is the responsibility of the MOS-producing formal schools and Centers of Excellence to ensure that graduates have mastered core skills in the respective occupational fields before they graduate to follow-on schooling or the operating forces."[367] The omission of any 2000-level events effectively implies that there is no additional training an 0207 must receive after they graduate their entry-level MOS school. The idea that an entry-level school can fully-train 0207s to serve in every echelon of the wing, support every Type/Model/Series (TMS), and do so in

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[364] Ibid., 7-11.
[365] Ibid.
[366] Ibid., 7-14.
[367] Commandant of the Marine Corps, *MCO P3500.72A Marine Corps Ground Training and Readiness (T&R) Manual*, 3-2.

every billet, is absurd, *prima facie*—only more so when one realizes that this manual was published in 2006, when 0207s only received two weeks of specialized Marine Corps training following an already-abbreviated NIOBC.

These serious problems were clearly not obvious to those who initially reviewed this manual. But once seen, these errors become glaring.

6.C.3. Air Intelligence Officers Course

In 2005, at the same time as the intelligence T&R manual was being re-written to conform to the new Ground T&R Program, it became clear to many in the Marine air intelligence community that working within the limitations of NIOBC as the vehicle for training 0207s was no longer sustainable. "The reality of the NIOBC course was that it did not in fact provide 0207s with the requisite skills they need to support Marine aviation units, since it provided little to no instruction on either tactical level intelligence or rotary wing intelligence requirements which are the primary focus within the Marine Corps."[368]

Navy and Marine Corps Intelligence Training Center (NMITC) issued a charter for the development of a new, Marine-specific entry-level school to train 0207s. By 2007, the course material was developed and NMITC conducted a proof of concept course at the end of that same year; in February 2008, this POI was submitted to TECOM for review and was officially approved.[369]

AIOC began as a twelve-week program (which later grew to fifteen weeks as course material was added), held three times a year. AIOC introduced

> periods of instruction and practical evaluations by USMC, USN, and USAF fixed wing pilots …, joint targeting school instructors, and rotary wing pilots …. Students receive training on the Joint Mission Planning System (JMPS), members from throughout the

[368] Higgins, 26.
[369] Salerno, 24.

Marine Air Command and Control System (MACCS) provide tours and periods of instruction on air Command and Control procedures and their associated elements/systems and at least three opportunities are scheduled for the students to ride/drive in flight simulators with pilots.[370]

6.C.3.A. The Redundancy of the 0277 MOS

Because the limitations of NIOBC led to both the creation of the 0277 MOS in the late 1990s and the creation of AIOC in the mid-2000s, these two solutions conflicted.

Prior to AIOC's creation, the Intelligence WTI course provided much needed credibility as well as tailored and focused Marine air intelligence training. "AIOC was intended to provide 0207s with the credibility they had previously relied on the WTI course for. To achieve this, AIOC repurposed much of the course material from WTI's Intelligence Officer Course, providing an almost identical academic experience."[371] The creation of AIOC, then, raised the 'fleet average' for 0207s, but removed much of the difference between 0207s and 0277s.

While this finally applied the solution to the root of the problem, it created a residual problem with the 0277 MOS. With no documented differentiation of the 0207 and 0277 MOS and the erasure of the practical, if undocumented, differentiation, the justification for the 0277 MOS's existence was called into question.

This presented an opportunity for the Intelligence WTI course's curriculum to evolve. Instead, however, the course came to be thought of as a course that provided good training but bestowed no additional skills or qualifications and did not require special screening or preparation. Because there still remained no enlisted air intelligence training and because MOJT for both officer and enlisted air intelligence Marines was lacking, the Intelligence WTI course

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[370] Higgins, 29.

[371] Christopher A. Denzel, "Professionalizing Air Intelligence, Part II: Who needs an 0277?," *Marine Corps Gazette*, March 2018, 41.

had to continue to "teach to the lowest common denominator of enlisted Marines without prior aviation intelligence experience" as well as to intelligence Marines from outside the ACE (who also had no air intelligence experience) and air intelligence officers who, despite having specialized training, still did not undergo any mandated screening or preparation process before attending the WTI course.[372] This prevented the intelligence course at WTI from seriously evolving into the 'graduate-level' training that WTI provides for most other MOSs.

With one exception, 0277s are not required for the instruction or evaluation of any T&R event (as they are for many events in the Aviation T&R Program). The exception is: "0200-GEN-2010: Support the development of tactics to counter adversarial threats," an event finally added in the fifth Intelligence T&R Manual (previous editions did not require 0277s for any events, either as MOSs to be trained or as the instructor/evaluator). However, the 0277 requirement for this event (see Figure 16) falls apart upon even a cursory inspection. First, the event is for both 0233s (ITIs) and 0277s. The only thing shared by both MOSs is that they are intended to be advanced tactical intelligence instructors (though neither MOS is used in that way). Second, the event has no components that would not be equally expected of an 0207 (e.g., 0207s require no specialized training to read and understand IC assessments of countermeasures or countertactics effective against given threats)—in fact, the event's 0200 (vice 0277) coding indicates as much. And third, the event has no components for which 0277s receive specialized training (indeed, the entire 0277 chapter is simply comprised of 0200 and 0207 events).

[372] Marine Aviation Weapons and Tactics Squadron One Intelligence Department Head, *Aviation Intelligence Weapons and Tactics Instructor Program Operational Planning Team After-Action* (Marine Corps Air Station Yuma, AZ: Marine Aviation Weapons and Tactics Squadron One, December 6, 2016), 3.

0200-GEN-2010: Support the development of tactics to counter adversarial threats

EVALUATION-CODED: NO **SUSTAINMENT INTERVAL**: 12 months

DESCRIPTION: The ITI/WTI is a subject matter expert on the capabilities and tactical employment of threat weapon systems and support MAGTF operations by training Marines to develop countermeasures for adversarial threats.

MOS PERFORMING: 0233, 0277

BILLETS: Intelligence Weapons and Tactics Instructor, Intelligence and Tactics Instructor

GRADES: SGT, SSGT, GYSGT, MSGT, CAPT, MAJ, LTCOL

INITIAL TRAINING SETTING: FORMAL

CONDITION: Given a higher headquarters order, commander's guidance, references, and operating within a MAGTF and Joint, Interagency, Intergovernmental, and Multinational (JIIM) environment

STANDARD: To synchronize intelligence operations in order to support the commander's planning, decision, execution and assessment (PDE&A) requirements within the time allotted.

PERFORMANCE STEPS:
1. Identify threat systems and tactical capabilities.
2. Identify threat system disposition.
3. Identify intelligence gaps.
4. Integrate intelligence gaps into collections.
5. Integrate intelligence into planning.
6. Advise commander on countermeasures to threats (as required).

REFERENCES:
1. AFTTP 3-1_ Threat Reference Guide and Countertactics Manual (classified)
2. DIA_ Weapons Technical Intelligence Handbook 2.0, Mar 2014
3. MCWP 3-1 Ground Combat Operations
4. MCWP 3-2 Aviation Operations
5. Worldwide Equipment Guide Volume 2 Worldwide Equipment Guide Volume 2
6. Worldwide Equipment Guide Volume 3 Worldwide Equipment Guide Volume 3
7. Worldwide Equipment Guide Volume I Worldwide Equipment Guide Volume I

Figure 16. 0200-GEN-2010. Commandant of the Marine Corps, NAVMC 3500.100B Intelligence Training and Readiness Manual, Enclosure (1), 19-13 - 19-14.

Added to this, the duties and MOS descriptions of 0277s and 0207s are effectively identical. While an 0207's duties are not formally listed anywhere (the MOS manual directs readers to the Intelligence T&R Manual for a description of an 0207's duties but the Intelligence T&R Manual does not actually list them), the MOS summary in the MOS manual describes the MOS:

> Air Intelligence Officers serve as the intelligence functional experts at all command levels of the Marine Air Wing (MAW). They develop and execute intelligence plans, policies, and procedures that facilitate operations across the six functions of Marine aviation. They are the advisors to commanders, staffs, and pilots on intelligence activities, operations, and actions as well as the provider of intelligence products to support mission planning and execution. They also support the overall intelligence effort of the parent command or intelligence authority. Billets normally include Targeting Officer, Collections Officer, Dissemination Officer, S-2 Officer of a fixed-wing or rotary wing squadron, and Intelligence Officer at an intelligence battalion.[373]

The WTTP, under which all non-0277 WTIs fall, is also relatively narrowly-scoped to the Aviation T&R Program. It focuses on operational readiness specifically through unit aviation training programs and support of the T&R events within the Aviation T&R Program. MAWTS-1, through the WTTP, is charged with conducting the WTI course, an "instructor certification [program] that [supports] the Marine Aviation T&R Program."[374] 0277s and all other intelligence MOSs, however, fall outside the Aviation T&R Program (as part of the intelligence OccFld, they fall under the Ground T&R Program), 0277s have no requirement to be formally used as instructors (as there is no instructor requirement of any kind within the Ground T&R Program), and no air intelligence T&R event they might have instructed falls within the Aviation T&R Program.

Furthermore, while the Intelligence WTI course has existed since at least 1996 and produced 0277s since the late 1990s, there remains no formal acknowledgement of an embedded or supplementary intelligence course to produce 0277s (this acknowledgement is included in a WTTP draft re-write, but it has not yet been published). In fact, the WTTP explicitly enumerates the MOSs that it produces, omitting 0277.[375]

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373 Commandant of the Marine Corps, *NAVMC 1200.1D Military Occupational Specialty* Manual, Enclosure (1), 1-12.

374 Commandant of the Marine Corps, *MCO 3500.109 Marine Corps Aviation Weapons and Tactics Training Program*, 2.

375 Ibid., Enclosure (1), 5.

This all builds to the fact that there is no requirement for the Marine Corps to have, and therefore for MAWTS-1 to produce, 0277s.

This is not to detract from the value in creating the 0277 MOS or the value it provides today, but rather to underscore the backwardness of its creation (made worse by lack of doctrinal air intelligence foundations on which to formally rest the requirement) and the confusion its redundancy with 0207s has caused in the air intelligence community, contributing to the community's inability to use 0277s as instructors.

In 2016, nearly two decades after the creation of the 0277 MOS, the MAWTS-1 Intelligence Department Head would host an Operational Planning Team (OPT) "aimed at assessing the objectives, content, and scope of the USMC Aviation Intelligence Weapons and Tactics Instructor (WTI) Program" to define the 0277 MOS and to develop a campaign plan to evolve the WTI intelligence course's POI accordingly.[376] The OPT identified "four core skills that every WTI is expected to develop and master: Threat Subject Matter Expert … Mission Planner … Instructor … Communicator."[377] However, the OPT identified that the lack of enlisted air intelligence training and the lack of MOJT for air intelligence officers and enlisted alike as the limiting factors within the Intelligence WTI course, requiring it to continue to teach to a relatively low 'common denominator' and preventing MAWTS-1 from seriously advancing the course, and preventing 0277s from being utilized as instructors.

In sum, AIOC was a step forward. But it was one that was not integrated into a comprehensive plan for air intelligence training, creating, for 0277s, almost as many problems as it solved.

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[376] Marine Aviation Weapons and Tactics Squadron One Intelligence Department Head, *Aviation Intelligence Weapons and Tactics Instructor Program Operational Planning Team After-Action*, 1.

[377] Ibid., 1-2.

6.C.4. 2000s Summary

The 2000s represented a slow-down in improvements for air intelligence. Perhaps because of the high operational tempo of the wars in Afghanistan and Iraq, as well as the concurrent requirement for the Service to grow (which tends to dissuade from improvements to rigor in training), air intelligence was really only able to establish its own officer formal course in this decade.

While this represented a step forward, the creation of AIOC must be placed in the context of three facts.

First, it took place only after the significant evolution of the Ground T&R Program (diverging from the Aviation T&R Program), resulting in the disappointing 2006 T&R manual. This placed the new formal course on a hollow foundation and would retard air intelligence progress for another decade.

Second, as the only formal entry-level air intelligence course in the Marine Corps (until the SITCC, in 2018), AIOC helped create a focus on entry-level training that, while beneficial in improving initial air intelligence training, contributed (alongside the Ground T&R Program) to the myopic focus on entry-level T&R events, to the detriment of MOJT training.

Third, the creation of AIOC brought into question the reason for the 0277 MOS's existence and highlighted how 0277s were and continued to be misused in comparison to the role of WTIs in other OccFlds.

The result, then, was one step forward and one step back for air intelligence. The decade perhaps offered a net gain, but only marginally so.

6.D. 2010s: Getting Serious About Change

As the operational tempo of the 2000s declined and national strategic vision slowly shifted to focus on peer- and near-peer competition, the Service (along with other elements of the DOD) stepped back to assess what was gained (and how to institutionalize it) and what was lost (and how to restore it) during a decade of counterinsurgency. For Marine intelligence, this was epitomized by the 2011 RAND study, *Alert and Ready*, which the DIRINT requested to assess the ad hoc evolution of the MCISRE.

Additionally, after the first full decade of Van Riper Plan implementation, it was increasingly easy to see what elements of it worked and where it fell short. Within air intelligence, there was an increasing realization that little improvement had been made. Joined by an increasing awareness within Marine aviation that its intelligence support was not prepared for the future operating environment, this set critical conditions that would culminate with the creation of the WISC. The result, then, was a decade of the most substantial improvements to air intelligence yet seen.

6.D.1. The Third Intelligence Training and Readiness Manual

In March 2011, *NAVMC 3500.100 Intelligence Training and Readiness Manual* was signed, canceling the previous manual, *NAVMC DIR 3500.101*. Noticeably, the third edition removed references to the DRRS system and the reporting of intelligence T&R completion as a component of overall unit readiness for all units with intelligence sections.

The third edition of the T&R manual carries over from the second the same flaws with respect to only including 1000-level events for air intelligence. Of the twelve 0207-specific T&R events (0207s also require eight 0200 MOS events, so-coded because they are common across multiple 02xx MOSs), again only one (0207-ANYS-1007: Provide intelligence support to the six functions of Marine aviation) mentions any performance steps specific to Marine aviation or enemy air and air defense topics. This version of the event is only marginally improved from the 2006 manual's 0207-ANYS-1009, correctly mentioning the MACCS (instead of a COC) and articulating as a performance step the provision of in-flight intelligence support to sorties.[378]

Outside of this event, aviation is mentioned in three other events. 0207-ANYS-1002 (Direct Step 2 of the IPB process: Describe environmental effects on operations/describe the battlespace environment) appends to its generic IPB step 2 description: "In providing human factors to aid in aviation mission planning, one must identify how human factors provide advantages and disadvantages to aviation operations and mission planning."[379] This is hardly a useful insight. 0207-ANYS-1003 (Direct Step 3 of the IPB Process: Evaluate the threat/adversary) appends to its generic IPB step 3 description: "In evaluating the threat to aviation operations, one must identify the enemy's capability and intent to target aircraft, locate high value targets/individuals, identify centers of gravity, critical vulnerabilities, and the enemy's capability to maintain an integrated air defense system, to name but a few."[380] Again, no great insight. And finally, 0207-ANY-1004 (Direct Step 4 of the IPB Process: Determine threat/adversary courses of action) appends to its generic IPB step 4 description:

> In supporting aviation operations, identification of air threat zones and associated metrics (Black-Green) are required in order to support threat mitigation criteria for each type/model/series. Additionally, the threat course of action (COA) for how an IADS [Integrated Air Defense System] will be executed through the employment of joint, missile, and fighter engagement zones to defend airspace or conduct offensive operations is required.[381]

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[378] Commandant of the Marine Corps, *NAVMC 3500.100 Intelligence Training and Readiness Manual* (Washington, D.C.: Headquarters, United States Marine Corps, March 18, 2011), 9-15.
[379] Ibid., 9-10.
[380] Ibid., 9-11.
[381] Ibid., 9-12.

This actually provides some utility by identifying an aviation-specific intelligence tool (air threat zones) as well as an air and air defense-specific operational framework (joint, missile, and fighter engagement zones). Disappointingly, however, there is no reference to any Marine aviation (or air defense) operational publications, nor any references to air and air defense threat manuals that might help instruct, execute, or evaluate this event.

The 0207 chapter, then, has little to distinguish it from a generic intelligence MOS chapter.

By comparison, the 0203 chapter has six additional events involving reconnaissance and surveillance and integrating intelligence support to the ground scheme of maneuver. This makes 0207 the only specialized intelligence officer MOS in this T&R manual that has no specialization. Thus, the manual strongly implies that 0207s are generalist intelligence officers with no special skills and, consequently, Marine aviation has no specialized operational or planning processes and no specialized intelligence requirements, an implication that is demonstrably wrong. This manual, then, perpetuates the perception that there is nothing special about air intelligence—indeed, that 0207 is not a valid specialty but rather a code for generalists stationed in the air wing.

The reasons for these shortfalls can be found in the Record of Proceedings (ROP) for the T&R conference that drafted the manual.

First, the only MAW representatives in attendance were three senior Staff Noncommissioned Officers (SNCO).[382] So neglect of the only (officer) air intelligence MOS is somewhat understandable.

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[382] Intelligence Task Analyst, Ground Training Branch, *Record of Proceedings for the Intelligence T&R Manual Review Conference* (Quantico, VA: Training and Education Command, April 23, 2010), 1-2.

Second, the focus of effort for the conference was intended to be collective, not individual events (at the time there were no collective events for air intelligence sections at any echelon of the MAW).[383] Interestingly, however, the conference failed to generate *any* collective events and recommended the manual be published without them, intending to include them at a later date only as an addendum (so this manual, too, included only individual events).[384]

Third, the methodology agreed upon for the development of collective events was for them to be "developed using intelligence Marine Corps Tasks (MCTs) as a starting point and cross-referencing them against the infantry regimental (8000-level) T&R events."[385] The "way ahead" methodology for collective events continues: "the Intelligence community will develop the remainder of tasks in support of the infantry T&R … The first iteration of Intelligence T&R events will reflect those tasks required in support of infantry operations. Efforts will then shift to focus on the development/refinement of tasks in support of aviation operations," which never happened.[386] Air intelligence, then, was intentionally left out with a promise only that it would be addressed eventually.

Third, there were only two recommendations listed in the ROP as related to 0207 events: that "0207-GENI-1030: Employ an Intelligence Section" should be made an 0201 task common to all intelligence officers; and that language about "conducting" IPB should be modified to "directing" to reflect the officer's role in the process (although the discussion routinely and erroneously refers to air intelligence officers as 0203s).[387] Finally, the conference attendees validated all the 0207 individual events (of which only one seriously, if generically, addresses air

383 Ibid., 3.
384 Ibid., 21.
385 Ibid., Enclosure (2), 1.
386 Ibid., 1-2.
387 Ibid., 7-8.

intelligence subject matter) as sufficient and appropriate—an act only understandable because of the complete absence of any MAW officer representation.[388]

And lastly, the ROP refers to this as the "2nd generation Intel T&R Manual," suggesting that *MCO 3500.32*, with its robust treatment of air intelligence training requirements, was, at the time, entirely forgotten.

6.D.2. Alert and Ready: An Organizational Design Assessment of Marine Corps Intelligence

In July 2011, RAND published *Alert and Ready: An Organizational Design Assessment of Marine Corps Intelligence*, commissioned by the DIRINT to review the organizational enterprise of the MCISRE after almost a decade of ad hoc adjustments. The study, intended to address organizational issues in the MCISRE, also partially addressed issues discovered in its research that it identified as non-structural (omitting recommended solutions for them).

Of the forty-eight issues the study identified (ranked on a threat/risk score from 0.00-1.00), general shortfalls in air intelligence ("Vicious cycle in aviation: intelligence not well prepared to support aviators; aviators view intelligence as irrelevant") ranked second-highest with a score of 0.96.[389]

While it is neither clear how well the study was received by the DIRINT nor what action was taken on the structural issues it identified, it had significant benefit for air intelligence. It was an academic, external, and relatively objective validation of the shortfalls that many air intelligence Marines and aviators had been identifying at least back to 1968. It was immediately used as justification to improve the most severe shortfall contributing to this 'vicious cycle' at

[388] Ibid., 21.
[389] Paul et al., 52.

the time (enlisted intelligence air training). Most recently, it has been used to support the development of the WISC under Force 2025.

Alert and Ready is discussed more in Chapter 3.

6.D.3. Squadron Intelligence Training and Certification Course

Marine Corps, Deputy Commandant for Aviation (DCA) and DIRINT agreed with the air intelligence training deficiency identified by the RAND study, prompting a SME conference to address the issue. This conference

> yielded 3 fundamental training shortfalls; (1) absence of an intel community training and readiness (T&R) manual, (2) absence of a linked MAW Intel T&R order, and (3) lack of a standardized aviation Intel training program addressing [five] job knowledge deficiencies, resulting in a 12-18 month on-the-job training requirement.[390]
>
> The five knowledge deficiencies identified were:
>
> - Non WTI Intel/METOC [Meteorological and Oceanographic] Marines are deficient in their basic understanding of adversarial aviation/anti-aviation capabilities, capacities, and requirements.
> - Intel/METOC Marines lack the appropriate understanding of the capabilities, limitations and employment methods for USMC aviation Intelligence Surveillance and Reconnaissance (ISR) platforms, sensors, and processes: Electronic Intelligence (ELINT) jamming and collections sensors, Tactical Electronic Reconnaissance Processing and Evaluation System (TERPES), Joint Tactical Aerial Reconnaissance Systems (JTARS), LITENING POD II, Video Exploitation Workstation (VEW), Harvest Hawk, BRITE Star, and electro optical sensors.
> - METOC Marines are deficient in their abilities to apply METOC assessments/data pertaining to the effects on aircraft … flight sensors, ISR sensors, munitions/targeting effects, and anti-air enemy threat systems.
> - Intel/METOC Marines lack the ability to provide synergized, multi-disciplined intelligence support to the aviation planning and the air tasking cycle (specifically planning steps II and VI).[391]

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[390] Assistant Chief of Staff G-2, Second Marine Aircraft Wing, *Squadron Intelligence Training and Certification Training Program (Information Paper)* (Marine Corps Air Station Cherry Point, NC: Second Marine Aircraft Wing, March 25, 2014), 1. Presumably, the lack of an "intel community T&R manual" was intended to mean the lack of useful air intelligence T&R events for 0231s and for follow-on or sustainment training for 0207s.

[391] Step II of the air tasking cycle is Target Development. Step VI is Assessment. Joint Chiefs of Staff, *JP 3-30 Command and Control of Joint Air Operations* (Washington, D.C: Joint Chiefs of Staff, February 10, 2014), III-21.

- Intel/METOC Marines' basic understanding of aviation's combat roles in support of the Marine Air Ground Task Force (MAGTF) is inadequate. Intel/METOC Marines are deficient in their understanding of the operational responsibilities and integration of the various MAW organizations and related assets to execute the six functions of Marine aviation.[392]

These shortfalls were found to be "systemic across all 3 MAWs" and resulted in the requirement for extensive informal MOJT which "does little to meet squadron level and operational Intel and METOC mission essential tasks" with approximately one third of 0231s becoming "effective and confident ½ way through [their] tour by way of hard work and force of personality," one third becoming effective and confident by the end of their tour, and one third "[failing] to assimilate with marginal effectiveness."[393]

The initial solution was an informal two-week Squadron Intelligence Training Course, taught by the 2d MAW ACI (for 2d MAW intelligence Marines), using re-purposed MAWTS-1 courseware with the intent to give 0231s "entry-level skills to perform: aviation intelligence fundamentals/support, aviation threats to the MAGTF, Intelligence in support of all Marine Corps type/model/series (TMS), and intelligence support to Live Virtual Constructive (LVC) tactical aviation scenarios."[394] In 2013, the 2d MAW G-2 developed this curriculum in accordance with the Systems Approach to Training (SAT) standards, adding the word "Certification" to the course name, extending it to four weeks, and submitting proof of concept Course Descriptive Data (CDD) to TECOM for consideration as a formal course. (CDDs "[document] course description, resource requirements, and justification for the development or

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[392] Assistant Chief of Staff G-2, Second Marine Aircraft Wing, *Squadron Intelligence Training and Certification Training Program (Information Paper)*, 1-2.

[393] Ibid., 2; Aviation Intelligence Community of Practice Sponsor, *0231 Aviation Intel Training Solution* (Washington, D.C.: Headquarters, United States Marine Corps, Intelligence Department, January 5, 2016), 3.

[394] Assistant Chief of Staff G-2, Second Marine Aircraft Wing, *Differentiation Between the Squadron Intelligence Training Certification Course (SITCC) and the Wing Intelligence Support Company (WISC) Sustainment Training Plan* (Marine Corps Air Station Cherry Point, NC: Second Marine Aircraft Wing, December 11, 2017), 2.

refinement of formal Programs of Instruction (POI) taught at Marine Corps [formal schools].")[395] TECOM rejected the CDD, citing a moratorium on new POI/course growth until FY2016.[396]

In June 2015, the three MAWs held an aviation intelligence training conference, including representatives from Marine Corps Intelligence Schools (MCIS—to include AIOC and MAGTF Intelligence Specialist Entry Course [MISEC]) and I-Dept, where they reviewed the SITCC solution and unanimously: revalidated the existence of the 0231 entry-level training deficiency; agreed that the SITCC fixes the deficiency; and agreed that if SITCC were formalized, it would fix the entry-level training deficiency institutionally.[397]

As FY2016 approached, the DIRINT issued (and DCA endorsed) a request for formal determination by TECOM of the SITCC's POI. In it, he identified the SITCC as the only effort in the four years following the RAND report's publication to identify and apply a solution to the air intelligence shortfalls it identified.[398] In response, TECOM agreed to conduct a formal evaluation of SITCC through FY2016 "to determine if the course satisfies entry level formal training shortfalls not supportable via MISEC," the entry-level course for 0231s (the POI of which was composed of less than 5% air intelligence material).[399]

On 6 September 2017, I-Dept approved 0271 as an NMOS (for 0231s) and as of FY2019, the 0271 MOS was added to the MOS manual and all 0231 Billet Identification Codes (BIC) in

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[395] Commandant of the Marine Corps 2015, *NAVMC 1553.2 Marine Corps Formal School Management Policy*, Enclosure (1), A-1.

[396] Assistant Chief of Staff G-2, Second Marine Aircraft Wing, *Squadron Intelligence Training and Certification Training Program (Information Paper)*, 3.

[397] Aviation Intelligence Community of Practice Sponsor, *0231 Aviation Intel Training Solution*, 5.

[398] Marine Corps Director of Intelligence, *Request for Program of Instruction Determination for the Squadron Intelligence Training and Certification Course* (Washington, D.C.: Headquarters, United States Marine Corps, September 21, 2015), 1.

[399] Commanding General, Training and Education Command, *Request for Program of Instruction Determination for the Squadron Intelligence Training Certification Course* (Quantico, VA: Training and Education Command, April 20, 2016), 1; Aviation Intelligence Community of Practice Sponsor, *0231 Aviation Intel Training Solution*, 2.

the wing were converted to 0271s (as the Billet Military Occupational Specialty [BMOS] for the BIC).

Prior to SITCC, 0231s were without formally-instructed air intelligence expertise. And because “squadrons often don’t rate an 0207 … This leaves an 0231 in charge of intelligence operations for a tactical deployable air squadron with neither formal nor ‘on-the-job training’ in air-specific intelligence.”[400] Coupled with the fact that

> many squadrons are only permanently manned … with one or two 0231s and reinforced with additional 0231s and an 0207 for deployments, this system of teaching, retaining, and employing knowledge is not as effective as it could and should be, and most of this informal training is lost or atrophies with post-deployment manpower turnovers.[401]

Between 2011 and 2017, SITCC provided this training to an increasing number of 2d MAW intelligence Marines (and a handful of intelligence Marines from other MAWs). However, while the establishment of the 0271 MOS did a great deal to institutionalize SITCC, by virtue of the fact that the PMOS associated with 0271 is 0231, the formalized SITCC course now excluded non-0231s such as METOC Marines, who had been identified as having air intelligence training deficiencies as well. There are plans to expand the PMOS prerequisites associated with 0271 in a future MOS manual to address this.

6.D.3.A. Second Marine Aircraft Wing’s Intelligence Training and Readiness Manual

2d MAW also attempted to address the T&R deficiencies identified in the development of SITCC, drafting a so-called “2d MAW Intelligence T&R manual.” The thirteen-chapter, 182-page document attempts to institute a unit-level (i.e., specific to 2d MAW) T&R program and

[400] Margaret Seymour, “Intel Isn’t Broken,” *Marine Corps Gazette*, August 2015, 43.

[401] Christopher A. Denzel, “Professionalizing Air Intelligence: An MOS tactics, techniques, and procedures manual,” *Marine Corps Gazette*, January 2016, 73.

institute unit G/S-2-level METs. (The basic concept of this manual is not possible in the Service's T&R framework.)

The manual outlines the following event levels, with a chapter for each:

- 10000-level: MEF ACE
- 9000-level: MEB ACE
- 8000-level: MAG
- 7000-level: MEU ACE
- 6000-level: Squadron ACE
    - 6100-level: FA-18
    - 6200-level: EA-6B
    - 6300-level: AV-8B
    - 6400-level: C-130
    - 6500-level: H-1
    - 6600-level: MV-22, CH-53, CH-46
    - 6700-level: UAS
    - 6800-level: Ground Support[402]

Table 8. 2d MAW Intelligence T&R Manual Event Mapping

MET 3. Provide Intelligence and METOC Support to Assault Support	
SQDN-ANYS-6602 (MCT 2.4)	Provide All-Source Analysis in Support of Aviation Operations
SQDN-COLL-6604 (MCT 2.2 & 2.3)	Provide Multi-Sensor Imagery Analysis Products
SQDN-PLAN-6605 (MCT 2.1)	Provide Intelligence Support to Aviation Planning
SQDN-DISS-6606 (MCT 2.5)	Manage an Aviation Intelligence Dissemination Plan
SQDN-GENI-6608 (MCT 2.2.5 & 2.2.5.2)	Provide Intelligence Support to Rotary Wing and Tilt Rotor Assault Support Squadron Operations
SQDN-MTOC-6609 (MCT 2.2.1.9)	Provide Weather Forecasts and Hourly Observations
SQDN-MTOC-6610 (MCT 2.5.2.1)	Provide Critical Weather Effects to Threat Operations
SQDN-MTOC-6611 (MCT 2.1.10.1, MCT 2.4.5.1)	Provide METOC Assault Support Package
SQDN-MTOC-6612 (MCT 2.4.1.1)	Provide Climatology for Personnel Recovery Packages (PR)
SQDN-MTOC-6613 (MCT 2.1.10.1)	Provide Enroute and Time-On-Target forecast
MET 4. Provide Intelligence and METOC Support to Air Reconnaissance	
SQDN-TRGT-6601 (MCT 2.1)	Provide Intelligence Support to Targeting
SQDN-ANYS-6602 (MCT 2.4)	Provide All-Source Analysis in Support of Aviation Operations
SQDN-COLL-6603 (MCT 2.2)	Provide Intelligence Support to Aviation Collection Management
SQDN-COLL-6604 (MCT 2.2 & 2.3)	Provide Multi-Sensor Imagery Analysis Products
SQDN-PLAN-6605 (MCT 2.1)	Provide Intelligence Support to Aviation Planning
SQDN-DISS-6606 (MCT 2.5)	Manage an Aviation Intelligence Dissemination Plan
SQDN-GENI-6608 (MCT 2.2.5 & 2.2.5.2)	Provide Intelligence Support to Rotary Wing and Tilt Rotor Assault Support Squadron Operations

Source: Assistant Chief of Staff G-2, Second Marine Aircraft Wing, *Aviation Intelligence Unit Training and Readiness (T&R) Manual*, 11-1 - 11-2.

[402] Ground Support events largely pertain to intelligence support to airfield engineering and construction.

Within these chapters 2d MAW attempted to link individual T&R tasks to a syllabus-like construct, where specific categories of intelligence support outputs (the invented G/S-2 "METs") are articulated in terms of specific T&R events that train to the output. In this way, this manual makes an attempt at billet-based training. Table 8, from the manual's chapter 11 (for 6600-level events) depicts an example of this linkage.

Figure 17 depicts an example event.

The sheer size of the manual and number of the events (149) is tempered by the fact that many of them were copied liberally from one chapter into another, sometimes modifying only the event code, resulting in a number of events that make little sense (for example, an event supporting airfield construction operations calls for the production of a threat zone matrix—a tool for assessing threat to aircraft in flight—while another airfield construction support event calls for intelligence Marines to be trained to conduct bomb hit assessments).

Additionally, the billet-based training suggested by the event mapping is hindered by the fact that it was either an incomplete project (with copy/pastes intended to be place holders, revisited at a later date) or that they simply make no sense (for example, the event in Figure 17, supporting targeting, has little to do with MV-22, CH-53, or CH-46 support and even less to do with METOC support to those platforms, to which it is explicitly linked in Table 8).

Ultimately, the document, while obviously well-meaning and drafted by Marines earnestly trying to improve air intelligence, displays a serious misunderstanding of the Ground T&R Program and the unit readiness program (to include inventing METs and even "E-coding" its own events). Its flaws are also due in part to the lack of a concept for intelligence support to various aviation echelons and formations, making the identification of supporting events more challenging (evidenced by the indiscriminate and non-sensical assignment of tasks to supported

EVENT: SQDN-TRGT-6601 Conduct Intelligence Support to Targeting

EVALUATION CODED: Yes **SUSTAINMENT INTERVAL:** 12 Months

DESCRIPTION: The Intelligence Section is responsible for intelligence support to deliberate and reactive ACE targeting operations. Targeting is the process of selecting targets and matching the appropriate response to them. It takes into account both operational requirements and capabilities in identifying resources the adversary can least afford to lose or provide him the greatest advantage. This section is typically subdivided into three sub-sections: the target development cell, the target validation cell, and the battle damage assessment cell.

CONDITION: With the aid of references, acting as an Intelligence Section, given a mission, commander's guidance, targeting priorities.

STANDARD: Ensure the completion of the performance steps within the time limits established by the commander.

EVENT COMPONENTS:

1. Develop target intelligence with associated rationale to the ACE targeting board.
2. Nominate target intelligence with associated rationale to the ACE targeting board.
3. Present target intelligence with associated rationale to the ACE targeting board.
4. Maintain awareness of prioritized targets and target folders.
5. Provide target data and weather effects to Future Operations & ATO Development Cell strike planners.
6. Maintain cumulative BDA, target status, and estimates of target regeneration.
7. Identify targets that require re-strike
8. Provide updated target data to Current Operations Deep Battle Cell, Future Operations, and ATO Development Cell strike planners.

REFERENCES:

1. MCWP 2-1 Intelligence Operations
2. MCWP 2-2 Intelligence Collection
3. MCDP 2 Intelligence

Figure 17. Example Event from 2d MAW's Intelligence T&R Manual. Assistant Chief of Staff G-2, Second Marine Aircraft Wing, Aviation Intelligence Unit Training and Readiness (T&R) Manual, 11-2 - 11-3.

units). It is no surprise then that the manual does not appear to have been signed, was never implemented, has not arisen in subsequent debates related to T&R re-writes, and exists only as a series of files on the network drives of the 2d MAW G-2.

6.D.4. The Fourth Intelligence Training and Readiness Manual

As the Ground T&R Program matured, manual updates became more regular. In 2013, *NAVMC 3500.100A Intelligence (Intel) Training and Readiness (T&R) Manual* was released, cancelling NAVMC 3500.100. The centrality of DRRS reporting returned: "Units achieve training readiness for reporting in DRRS by gaining and sustaining proficiency in the training events in this Manual at both collective (unit) and individual levels."[403]

In this fourth edition, collective events were finally added back in, with nine pertaining to air intelligence.

INTL-AVNT-8901 (provide intelligence support to aviation operations) outlines the unique nature of air intelligence support:

> Intelligence support to aviation operations includes the support of the six functions of Marine Aviation, such that each Type-Model Series (TMS) is supported with tactical, relevant, timely, and accurate intelligence support throughout the planning, decision, execution, and assessment … cycle. Intelligence support includes, but is not limited to: all-source analysis, SIGINT, [Imagery Intelligence], METOC, CI/HUMINT, [Measurement and Signature Intelligence], GEOINT [Geospatial Intelligence], and aerial reconnaissance. Different units may emphasize one or more event components over others, based on individual missions. Task steps and performance measures may not apply to every staff, unit, or echelon and are dependent on mission variables and time available. Prior to evaluation, coordination should be made with the evaluator and the higher headquarters of the evaluated unit to determine performance measures that may or may not be evaluated.[404]

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[403] Commandant of the Marine Corps, *NAVMC 3500.100A Intelligence (Intel) Training and Readiness (T&R) Manual*, 1.

[404] Ibid., Enclosure (1), 3-4 – 3-5.

The event further explains the specialized nature of air intelligence support in the "Other Support Requirements" section:

> This task may require highly technical advanced individual skills certification tailored to function, billet, mission and unit's role in a JIIM [Joint, Interagency, Intergovernmental, and Multinational] environment. Certification requirements may be satisfied by a combination of organic unit training and intelligence specific training provided by external training capabilities. Recommend WTI-I certified personnel consult with [the] local RITC [Regional Intelligence Training Center] to develop short, mid and long-term training plans tailored to unit and mandated pre-deployment training requirements.[405]

It even lists forty-five references, some of which include the operational publications for the supported units' missions (e.g., *MCWP 3-24 Assault Support*). However, a closer inspection of this event shows that there is very little meaningful content in its three pages. With the exception of a 'recommendation' that an 0277 'consult' with the RITC, nothing is actually specified in the event description or other support requirements. The event reads as an admission that each instantiation of it will vary considerably and, as a consequence, it offers no guidance or standardized training. The event components themselves merely refer users to the other eight collective air intelligence events: INTL-AVNT-4001 – INTL-AVNT-4008.

These 4001 through 4008 event titles read "Provide Intelligence Support to [squadron type]" where squadrons type are "Fixed Wing Fighter Attack Squadron Operations (F/A-18 and AV-8B)," "Electronic Warfare Squadron Operations (EA-6B)," "Fixed Wing Assault Support Squadron Operations (C-130)," "Rotary Wing Attack Squadron Operations (*H-1)," "Rotary Wing and Tilt Rotor Assault Support Squadron Operations (MV-22, CH-53)," "Unmanned Aerial Vehicle Operations," "Tactical Air Command Center (TACC) operational elements," and "the Marine Wing Support Squadron (MWSS)," respectively.[406] These events contain relatively

[405] Ibid., Enclosure (1), 3-6 – 3-7.
[406] Ibid., Enclosure (1), 3-4 – 3-5.

detailed performance steps tailored to the relevant squadrons, although the quality varies somewhat, and the references for each event are tailored and comprehensive. Figure 18 depicts the event components for INTL-AVNT-4001: Fixed Wing Fighter Attack Squadron Operations [F/A-18 and AV-8B], which has comparatively detailed event components.

EVENT COMPONENTS:
1. Develop Standard Operating Procedures (SOPs).
2. Establish intelligence watch within the Combat Operations Center.
3. Establish intelligence support detachment(s) as required.
4. Provide intelligence preparation of the battlespace (IPB) products to mission planners.
5. Support the development of Strike Mission Concept of Operations (ConOps) matrices.
6. Establish/maintain enemy graphic situation board.
7. Establish/maintain enemy digital situation board.
8. Assess enemy ground composition/disposition to support the targeting process.
9. Conduct tailored mission briefs for aircrew.
10. Debrief pilots.
11. Debrief aircrew (as required).
12. Generate mission reports.
13. Disseminate intelligence to higher/adjacent commands.
14. Provide intelligence support to aerial reconnaissance.
15. Direct collections assets.
16. Employ structured analytic techniques to forecast enemy activity.
17. Support HHQ intelligence collection.
18. Provide support to the Flightline Intelligence Center (FLIC).
19. Provide support to a Carrier Intelligence Center (CVIC).

Figure 18. INTL-AVNT-4001 Event Components. Commandant of the Marine Corps, NAVMC 3500.100A Intelligence (Intel) Training and Readiness (T&R) Manual, Enclosure (1), 3-44 - 3-45.

Only INTL-AVNT-8901 is E-coded. But even this is not meaningful as the unit at which it is conducted (the MAW) has no intelligence METs and therefore performance of this event, E-coded or not, would not contribute to any MAW's readiness metrics. For all their value, these events were short-lived and were deleted less than three years later with the fifth intelligence T&R manual, NAVMC 3500.100B.

Turning to individual events, of the twenty-six individual T&R events required to gain the MOS 0207, only one is unique to 0207s (i.e., the rest are common intelligence [0200] or common intelligence officer [0201] events).[407] This event, 0207-ANYS-1001: Provide intelligence support to the six functions of Marine aviation, is adequately written, with fifteen of the twenty performance steps specific to aviation mission support. Even the events' references are adequate, including air intelligence threat manuals, specific aviation mission planning guides, and two Marine aviation doctrinal publications. However, it is still only a single 1000-level event (i.e., representing the most basic skills for an MOS). The lack of any 2000-level events implies that there is nothing additional required for an 0207 to learn in the OPFOR and that there is only a single skill needed to provide the full range of air intelligence across the entire Service.

1003. MARINE LIGHT ATTACK HELICOPTER SQUADRON

A. MCT 1.3.3.3.2: Conduct Aviation Operations From Expeditionary Shore-Based Sites

INTL-FUNC-7901	INTL-ANYS-7001	INTL-PLAN-7001
INTL-AVNT-4001	INTL-AVNT-4002	INTL-AVNT-4003
INTL-AVNT-4004	INTL-AVNT-4005	INTL-AVNT-4006
INTL-AVNT-4007	INTL-AVNT-4008	

Figure 19. Representative T&R Event to MET Mapping. Commandant of the Marine Corps, NAVMC 3500.100A Intelligence (Intel) Training and Readiness (T&R) Manual, Enclosure (1), D-3.

One feature of the manual with great potential is its appendix D, which lists the METs of supported aviation units and maps individual T&R events that are supposed to support to them. Figure 19 depicts one MET from an HMLA METL (MCT 1.3.3.3.2: Conduct Aviation Operations From Expeditionary Shore-Based Sites), mapped to the eleven events in the T&R manual that support it. However useful this matrixing is in concept, it was done backwards. As written, it either implies that an intelligence Marine must be trained to support every TMS (i.e., events 4001-4008) in order to be able to support any one TMS (i.e., a squadron with the MCT 1.3.3.3.2) or that the MCT itself supports the listed T&R events (an inversion of the core concept

[407] Ibid., Enclosure (1), 11-2 – 11-3.

of a T&R event). In either case, it does not facilitate the development of a tailored training plan based on a Marine's supported unit and that unit's METs.

Again, the ROP for the T&R conference provides insight into the persistence of these air intelligence shortfalls. The only MAW representation was from a handful of SNCOs and a single officer, again challenging the air intelligence community to address the many flaws in the 0207 chapter. Indeed, the conference only addressed three 0207 T&R events: Intelligence support to the Marine Corps Planning Process, Estimate the Situation, and Integrate Counterintelligence Measures.[408] None of these events, nor any of the discussion around them, has anything uniquely to do with air intelligence.

The fourth T&R manual, then, has some value in its collective events. However, it is clear from both the lack of 2000-level events that would support these and the backwards MCT to T&R event matrixing that there was no comprehensive training approach in mind to ensure that all the intelligence requirements of the ACE would be met by the T&R manual. This lack of a comprehensive and coherent training vision to support half of the Service's maneuver forces is a characteristic shared among all of the T&R manuals after the first 1999 edition. And while the fourth manual is the only one to attempt to establish anything beyond entry-level training, with 4000- and 8000-level collective events, these are logically disconnected from any individual training events, limiting the ability of the OPFOR to successfully train to them.

6.D.5. The Aviation Combat Element Intelligence Standard Operating Procedures

In early 2014, I joined VMM-365 (Reinforced), the composite squadron ACE for the 24th MEU, as the squadron intelligence officer. During workup exercises for core MEU mission

[408] Intelligence Task Analyst, MAGTF Training and Education Standards Division, *Record of Proceedings (ROP) for the Intelligence T&R Manual Review Conference 7-17 Aug 2012* (Quantico, VA: Training and Education Command, August 2012), 5-6.

competencies (e.g., long-range raids, amphibious landings), as the squadron generated a number of intelligence requirements (IR) for each mission, I realized that some were shared between missions and all would be similar to IRs for real-world missions. I compiled these so that the intelligence section could better anticipate IRs and improve and accelerate our intelligence support. While this is the basic concept of a Generic Intelligence Requirements Handbook (GIRH), none of MCIA's existing GIRHs adequately address aviation operations. I recalled accidentally discovering a half-finished 'MEU ACE GIRH' created by First Lieutenant Kim Rossiter (who would later become one of the first AIOC instructors), abandoned on MAG-26's network drive. I integrated the two to create the 'MEU ACE GIRH 2.0.'

Shortly thereafter, Sergeant Douglas Pyra recommended adding Mission Report (MISREP) debriefing checklists, which he had developed during a previous deployment with the squadron. We expanded these checklists to cover all MEU ACE TMSs and added other MISREP best practices. I added threat definitions and reference information as well as templates for threat to air operations assessments tailored to the highly-abbreviated nature of the MEU's planning cycle. At this point, it became clear the document was no longer a GIRH but a tactical intelligence SOP and I renamed it the Air Combat Element Intelligence Standard Operating Procedures (ACEINTSOP).

The essential nature of such a comprehensive SOP was underscored by the challenges I faced in staffing the ACE S-2.

A MEU ACE is composited around a full VMM, which only has two organic 0231s (now 0271s). This T/O, unchanged since at least the 1980s, is inadequate to support modern MEU ACE operations with the connectivity the squadron S-2 now has to IC databases and reporting as well as the proliferation of collection capabilities, the ever-advancing sophistication of the threat, and the significantly-expanded range an MV-22B offers the MEU ACE as compared to the platform it replaced, all requiring substantially more intelligence support. This has necessitated informal staffing agreements and unit-level policy to staff a MEU ACE S-2 to a complement capable of supporting modern operations (normally seven to nine total Marines). Due to the negotiations required to get these augments as well as normal personnel attrition, I was the only member of VMM-365 (Reinforced)'s S-2 present for the entirety of PTP. The complexity of MEU operations made this a serious training liability for the ACE S-2.

As workups progressed and the ACEINTSOP grew, it became a training tool to accelerate the learning curve for intelligence Marines joining the squadron late in PTP.

By November 2014, the ACEINTSOP was made up of six sections:

> unit specific SOPs, battle rhythms, and administrative information; an analysis and assessment SOP and standardized methods for threat analysis and assessment; a *GIRH* tailored to MEU ACE mission sets; debriefing information, MISREP checklists, and guidance for MISREP drafting; a quick reference section for unclassified mission planning and air threat knowledge for use, studying, and PME; and periodic reference information of general use to intelligence Marines.[409]

After the final pre-deployment exercise in November, I mailed hard copies of the ACEINTSOP to MAWTS-1, AIOC, and 2d MAW's G-2 with a letter explaining the utility of the manual and how it could be expanded beyond MEU ACE operations and be evolved into a community standard if a responsible agency took ownership of it. When I returned from deployment in the summer of 2015, no action had yet been taken (these positions had all turned over and their copies of the ACEINTSOP could not be located).

After re-engaging, by March 2016, MAG-26 endorsed the ACEINTSOP as its official intelligence SOP for the group and its subordinate squadrons and by June 2016, 2d MAW made

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[409] Denzel, "Professionalizing Air Intelligence: An MOS tactics, techniques, and procedures manual," 74.

it the official tactical intelligence SOP for all its subordinate units, committing to "publish, update, and distribute a baseline Aviation Combat Element Intelligence Standard Operating Procedure (ACEINTSOP) for use within the subordinate Marine Aircraft Group (MAG) and squadron intelligence sections."[410] (However, this never happened and as late as 2018, there were leaders within 2d MAW's own ACI who were unaware the ACEINTSOP existed. Subordinate units were aware of the ACEINTSOP only by word of mouth.) And by 2018, Marine Detachment (MARDET) Dam Neck adopted the ACIENTSOP as the 0207 formal course's official tactical intelligence SOP.

While the experience was personally frustrating for me, it was also characteristic of air intelligence history in a number of ways relevant to this study.

The most obvious is that no such tactical SOP existed beforehand. While it is almost certain that previous MEU ACE S-2s had some sort of SOP (formal or informal, documented or undocumented), at no point during the development of the ACEINTSOP or since have any alternative SOPs turned up. This indicates that any SOPs in existence were of such marginal utility that they failed to endure. Alternatively, if robust SOPs existed, the community's ability to accumulate, disseminate, and improve upon knowledge was so low that any attempts made to pass them on were inadequate.

The only SOP I encountered in the development and maintenance of the ACEINTSOP or in the research for this study was a MAW SOP clearly designed to facilitate garrison inspections, not updated since 2003, and that contained no procedures for providing operational intelligence support. This is essentially the state of intelligence SOPs as described by Captain Johnson in 1955 (representing sixty years of stagnation). By comparison, the ACEINTSOP saw use in all

[410] Assistant Chief of Staff G-2, Second Marine Aircraft Wing, *Aviation Intelligence Standard Operating Procedures* (Marine Corps Air Station Cherry Point, NC: Second Marine Aircraft Wing, June 3, 2016), 1.

three active duty MAWs, at least four MAGs, and at least eleven squadrons by the end of 2016 (reaching the reserve wing, 4th MAW, by 2017) and has seen regular, if informal, use across the Service since. This widespread adoption is some indication of its utility (and, by extension, the lack of alternatives with sufficient utility to compete for use).

The second characteristic consistent with air intelligence history was the initial (and to an extent, continued) apathy of higher headquarters to institutionalizing improvements. Even today (and even for 2d MAW units—where it is nominally their own official SOP), knowledge of the ACEINTSOP generally relies on word-of-mouth (although it has been taught at AIOC since MARDET Dam Neck's adoption in 2018) and it has never been officially printed and disseminated by any headquarters. This indicates that even with something that has operationally-validated utility, institutional adoption of a complete product (that has no appreciable resource cost) can still take years.

6.D.6. Marine Corps Aviation Intelligence: A Doctrine, Organization, Training, Material, Leadership, Personnel, Facilities and Policy Analysis

In 2015, Major Joseph Freshour, a student at the U.S. Army Command and General Staff College, published his thesis *Marine Corps Aviation Intelligence: A Doctrine, Organization, Training, Material, Leadership, Personnel, Facilities and Policy Analysis*.

It is necessary to pause here to note that from this point forward in this case study, the trajectory of Marine air intelligence's history begins to shift appreciably. Major Freshour's thesis serves as the most obvious origin from which the current concerted effort to improve air intelligence can be traced. As a consequence, from this point forward, the history of air intelligence and its future (and therefore the conclusions of this research) begin to mix.

As a former MAWTS-1 instructor pilot and FA-18 pilot, Major Freshour was well-positioned to assess and personally-invested in the ability of Marine air intelligence to support Marine aviation operations in the future operating environment.

He identified the essential problem:

> The United States Marine Corps (USMC) has not faced a significant threat to aviation since Operation Desert Storm (ODS). Even then, it is difficult to label the Iraqi air defenses as formidable, due to the advantages the United States experienced in 1991. Since ODS and because of the demonstrated asymmetry of U.S. airpower, countries like Russia and China have worked to reduce the advantages U.S. airpower enjoyed against Iraq. With that, the last fourteen years of war against insurgent forces has allowed USMC aviation to operate with relative ease.
>
> The USMC aviation intelligence community has not had to focus on aviation threats and thus has not truly been tested.[411]

In a moment that has echoes of the Van Riper Plan, with an outsider tasked to fix intelligence, Major Freshour made the observation that

> While nearly all of the literature reviewed provides proposed solutions to correct aviation intelligence, none of them has provided research to identify and confirm that a problem or problems exist. This may be because intelligence personnel wrote all of the literature reviewed, with the exception of *Alert and Ready*. The underlying assumption is that personnel have witnessed and are convinced of the failings and do not see the need to prove that the system is broken. What is also interesting to note, is the fact that no USMC aviators have written regarding the performance of USMC aviation intelligence, even though the RAND survey indicates that they believe there is a problem. … all previous literature written about USMC aviation intelligence is insufficient. None of it has examined whether or not the current aviation intelligence enterprise is broken; it simply assumes it.[412]

Major Freshour's conclusion is open to some objections. It is certainly true that none of the literature he reviewed *academically* identified and confirmed problems (although Lieutenant Colonel Ingram's 1988 thesis does so, it was not found during Major Freshour's research).

[411] Freshour, 1.
[412] Ibid., 33-34.

However, the majority of the literature available (to both Major Freshour and to this research) are comparatively short *Marine Corps Gazette* articles, which do not lend themselves to systematic reviews of the issues. Nonetheless, most of these do, in fact, identify problems and propose solutions.

Regardless, Major Freshour is right in that no recent comprehensive academic study had been done on the shortfalls of Marine air intelligence and, almost more importantly, aviators had been absent from the discussion until Major Freshour's work (and, sadly, since).

To provide an academic identification of the problem, Major Freshour utilized the DOTMLPF-P framework, used during a variety of joint development processes to ensure all organizational categories are addressed for new capabilities or concepts. His research limitations precluded his ability to include material, facilities, and policy in his analysis.

Of the remaining five elements, he found all deficient. "Doctrinally, … aviation intelligence does not adequately support aviation operations because it lacks a basic reference for understanding concepts, operation, and procedures for the conduct of aviation intelligence in support of the ACE and the MAGTF."[413] Organizationally, "aviation operations are not being adequately supported by [intelligence] organizations at the highest levels and in joint and IC billets."[414] In training, he found deficiencies in all areas, identifying especially "the T&R manual [as] the source for a number of training deficiencies" (he also identified lack of adherence to the WTTP as a source for training deficiencies, however this is based on an incorrect reading of the WTTP).[415] In leadership, the lack of command billets "has the potential to create a lack of competition or desire for our best intelligence officers to serve in aviation intelligence billets. If

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413 Ibid., 43.
414 Ibid., 48.
415 Ibid., 58.

one does decide to take a billet inside aviation intelligence, they risk becoming non-competitive," thus risking the quality of personnel seeking to stay or return to the air intelligence field.[416] In personnel, Major Freshour concluded "aviation intelligence personnel are not adequately prepared to support aviation operations. This is due to a lack of formal aviation intelligence school requirements, a lack of management of enlisted intelligence specialists, and a lack of a requirements for WTIs in aviation intelligence units."[417]

As an academic study, it provided a more credible treatment of both the problems and recommended solutions. Authored by an aviator, it also carried more weight within the Service (the Marine Corps culture tending to weight with greater credibility to conclusions of operations personnel as compared to intelligence personnel).

The study's greatest significance, however, was its timing. Immediately preceding Force 2025 efforts, it provided current and relevant research to inform modernization plans. The Service gladly endorsed Major Freshour's findings, citing them alongside *Alert and Ready* as the two primary justifications for air intelligence modernization.

The results are impressive for any academic study. To rectify doctrinal deficiencies, his study recommended "a MCWP for aviation intelligence should be produced."[418] A Marine Corps Reference Publication (MCRP) was commissioned in early 2016 and is scheduled to be published by the end of 2019. To rectify organizational deficiencies, he recommended MCIA create a "dedicated aviation intelligence department" or, short of that, "request liaison officers from other aviation intelligence agencies."[419] Air intelligence is not an intelligence topic assigned to MCIA in the DIAP, making his primary recommendation somewhat inappropriate.

[416] Ibid., 60.
[417] Ibid., 65.
[418] Ibid., 73.
[419] Ibid., 74.

However, Force 2025 establishes Marine Corps liaison officers at two of the intelligence centers that do have air intelligence responsibilities under the DIAP (NGIC and MSIC), implementing his secondary organizational recommendation (if in reverse). To rectify leadership deficiencies, he recommended the creation of command opportunities and a career progression that would not punish air intelligence Marines for returning to the Wing. The planned establishment of the WISC and the creation of the 0271 MOS both contribute to realizing these recommendations. And to rectify personnel deficiencies, he recommended the creation of an enlisted air intelligence MOS, an increase in air intelligence training at MIOC to learn "what intelligence support aviation operations require and what intelligence support aviation operations can provide", and for 0277s to be utilized in accordance with the WTTP.[420]

When fully implemented, Force 2025 will accomplish the first and third recommendations while partially obviating the need for the second by creating a unit (the WISC) where 0202s without an 0207 background will learn the requisite skills Major Freshour identified. WISC efforts will even address some of the material elements his research did not cover (e.g., in the current efforts to build or locate WISC facilities at each air station).

Where Force 2025 efforts fall short with respect to his recommendations are in their neglect of training deficiencies. He recommended a "dedicated aviation intelligence T&R manual … be produced" that

> should produce a mission essential task list and individual METs that are focused on aviation intelligence and that can provide guidance on the conduct of regular unit level training events from the squadron S-2 to the MAW G-2. These should be nested with the respective aviation T&R manuals so the training is integrated and is taking place in support of aviation operations training … [and] must require evaluation by both WTI graduates and WTI instructors.[421]

[420] Ibid., 76.
[421] Ibid., 74.

Ultimately, then, Major Freshour's thesis provided a critical foundational document that enabled and informed the significant air intelligence reform efforts that followed. While some of his recommendations had been made by others before his thesis, his was the first attempt since Lieutenant Colonel Ingram's 1988 thesis to systematically analyze shortfalls in Marine air intelligence and provide specific recommendations. And while fortuitous timing may be as much to credit as anything, it may be reasonable to judge this as the most significant and impactful document to recent air intelligence reform.

6.D.7. MCRP 2-10A.9 Air Intelligence

On 26-27 January 2016, representatives from MAWTS-1 Intelligence Department, AIOC, MCCDC's Doctrine Control Branch, 3d MAW, VMFA-121 (then the Marine Corps' only operational F-35 squadron), MCIA, and the Aviation ISR Branch of I-Dept's Intelligence Plans and Policy Division (IPA) met at MCAS Yuma

> to discuss the current state of air intelligence, discuss current Marine Corps doctrine development and revision processes, and confirm if a doctrinal publication was desirable and feasible. … HQMC-Intelligence Department identified correcting shortfalls in Air Intelligence as one of the [DIRINT's] priorities. A lack of doctrine is one of these shortfalls.[422]

The group ultimately concluded that the MAWTS-1 Intelligence Department would draft and submit a Publication Development Order (PDO), initiating the formal doctrine development process. Approved in February, the PDO scheduled the author's draft to be complete by 31 October 2016 with the final draft signed and published by February 2018.[423]

The scope of the publication was delineated in the PDO as follows:

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[422] Marine Aviation Weapons and Tactics Squadron One Intelligence Department Head, *Air Intelligence Doctrine Working Group, 26-27 Jan*, 1.

[423] Deputy Commandant for Combat Development and Integration, *USMC Service Doctrine Publication Development Order (PDO) MCWP 2-X, Air Intelligence* (Washington, D.C.: Headquarters, United States Marine Corps, February 2016), 1.

This is a new publication. Publication will give an introduction to air intelligence and its importance. It will also discuss air intelligence support to the six functions of aviation, the science of air intelligence as well as how other intelligence disciplines support air intelligence. Additionally, it will discuss threats such as IADS and its specific components, space, electronic warfare, and asymmetric threats. It will address how IPB is tailored for air intelligence and applicable across the range of military operations. This publication will outline the general support air intelligence provides to aviation and how air intelligence plays a role in the Marine Corps Intelligence Surveillance and Reconnaissance Enterprise.[424]

The outline included nine chapters:

- Introduction
- Marine Aviation
- Science
- Multi Discipline Support to Air Intelligence
- Threat to Aviation Operations
- Air Intelligence IPB
- Aviation Mission Support
- Air Intelligence Role in the MCISRE
- Air Intelligence across the Range of Military Operations (ROMO)[425]

The Plan of Action and Milestones developed to support the PDO timeline assigned these chapters variously to AIOC, MAWTS-1, MCIA, I-Dept IPA, and myself, requiring draft outlines submitted to MAWTS-1 by 1 June, initial drafts submitted by 15 July (and sent to other contributors for comment), an initial consolidated author's draft completed by 12 September, allowing for the submission of the author's draft from MAWTS-1 on 31 October.[426]

By June, only one of chapters had been started.[427] Consequently, the assigned authors agreed to set aside a week to meet in person, away from their regular duties, to have an intensive

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[424] Ibid.

[425] Ibid., 4-5.

[426] Marine Aviation Weapons and Tactics Squadron One Intelligence Department Head, *MCWP 2-X Outline and Author's Draft Milestones* (Marine Corps Air Station Yuma, AZ: MAWTS-1, February 29, 2016), 1-2.

[427] Aviation Intelligence Community of Practice Sponsor, *June Aviation Intelligence COP Minutes* (Washington, D.C.: Headquarters, United States Marine Corps, Intelligence Department, June 16, 2016), 1.

doctrine-writing week (tentatively scheduled for 18-22 July 2016).[428] The meeting did not occur, however. By August, most authors had transferred (via PCS) from their commands without making any headway. The new MAWTS-1 Intelligence Department Head re-assigned the remaining chapters to the newly-arrived personnel at MAWTS-1, AIOC, and VMFA-121's S-2 (also assigning me an additional chapter), with the outlines due 22 October 2016, the drafts due 5 December, and a doctrine writing week from 5-9 December to polish the consolidated draft.[429] Again, by November, there was only progress with one of the newly-assigned chapters. This left seven of the nine remaining chapters untouched. The doctrine writing week was re-confirmed with the expanded scope of drafting and completing all remaining chapters based on outlines that would be finalized before then.

On 5 December, all but one of the authors had cancelled their trips and none had written or submitted any notes or outlines for their assigned chapters. As a result, over the next five days, the staff of MAWTS-1 and I wrote the remaining five chapters (eliminating the last two planned chapters to save time).

This highly-compressed timeline to write five of the publication's chapters resulted in relatively little critical thought as to structure or content and no time to conduct substantive editing or revisions beyond spelling and grammar, with the complete author's draft submitted on 16 December 2016.[430]

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[428] Ibid.

[429] Marine Aviation Weapons and Tactics Squadron One Intelligence Department Head, "MCWP Writing Gameplan," email, August 22, 2016.

[430] Aviation Intelligence COP Sponsor, *Jan Aviation Intelligence COP Minutes* (Washington, D.C.: Headquarters, United States Marine Corps, Intelligence Department, January 31, 2017), 1.

In the end, a single author, with limited rotary-wing squadron experience, was responsible for approximately 95% of the final author's draft. And during both formal and informal staffing, there were no substantive edits or comments from the OPFOR.

Personal frustration aside, the episode has a number of characteristics that are strong indicators of how ineffective the air intelligence community can be at identifying problems, developing solutions, and effectively implementing them.

The first consequence of this dysfunction is that the Service's first air intelligence doctrinal publication (to make it beyond coordinating draft, at least) is predominantly written by one comparatively junior Marine with a limited perspective. Thus, while a significant step forward, it falls well short of what it could have been with even minimal participation from the broader community. As a consequence, it is obvious that the manual already needs heavy revision. In practice, however, Service publications are not regularly revised and, based on the age of many other doctrinal publications, it is likely that Marine air intelligence will be stuck with a hastily-written publication for the next five-to-fifteen years. Furthermore, the inertia of an existing publication tends to result in light editing rather than sections or chapters being re-written from the ground-up (which, in the case of some chapters and sections, is necessary).

Second, it highlights serious process failures in the community's ability to bring about necessary change. After self-identifying a shortfall and initiating a course of improvement (i.e., agreeing on the need to draft doctrine), leadership positions within air intelligence (i.e., MAWTS-1 and AIOC) and Marine intelligence (i.e., I-Dept and MCIA) failed at multiple points to ensure adequate progress was made. Even after many of these positions turned over during the summer PCS season, new individuals in the same leadership positions fell short in the same ways. In the end, 324 calendar days, including 222 work days and 102 non-work days (weekends and holidays), passed with only a single individual putting pen to paper.

Even after a PCS cycle where many leadership positions rotated and an entire first set of deadlines had been missed, the community repeated, exactly, the same failures. Ultimately, the community relied on a single individual who was no longer in either an aviation or intelligence unit to write the bulk of the publication. And when the publication was circulated for comment, there was virtually no feedback from the OPFOR.[431]

6.D.8. The Fifth Intelligence Training and Readiness Manual

In 2016 *NAVMC 3500.100B Intelligence Training and Readiness Manual* was signed, cancelling NAVMC 3500.100A. Removed from this manual were any air intelligence collective events, replacing them with collective events either agnostic to supported unit or tailored only to Intelligence Battalions. This manual reduces the T&R events required to initially train an 0207 from twenty-six to twenty-one and expands the singular 0207 event from the fourth manual into six separate events (one for each function of Marine aviation). Aside from this breakout of events, the performance steps remained mostly the same, with little added specificity or expansion.

The references for air intelligence events are generally adequate, but whereas the failure to provide specific Marine aviation publications beyond *MCWP 3-2 Aviation Operations* and *MCWP 3-25.4 Tactical Air Command Center Handbook* was forgivable for the fourth manual (where all six functions were combined into a single event), the omission of specific publications dealing with each individual function of Marine aviation is less understandable here. Indeed, the

[431] The one substantive contribution during the process came when I informally circulated the Science chapter to a few dozen colleagues and one of these shared it with his wife, a test pilot. Her contributions helped to significantly re-order the presentation of the material in the chapter in a more logical manner. This contribution, while deeply appreciated, occurred by happenstance and was from outside the Marine intelligence community.

fact that the references for all six events are identical and the *TOP GUN Strike Planning Guide* is included for events that have nothing to do with it (e.g., the assault support event), strongly suggests that these references were simply copied and pasted across events, indiscriminately.

This may seem to be administrative and process nit-picking, however, the references for a T&R event are supposed to be the authoritative source from which the entire event is derived and against which it is evaluated. And while the attendees of the T&R conference certainly did not have time to author a Marine air intelligence publication, the function-specific Marine aviation publications should have at least been added. The fact that they were not supports the perception that Marine air intelligence has largely made it up as it goes along and its training requirements, as expressed in performance steps, are not grounded in the doctrine of the supported unit. At a minimum, it indicates that the T&R events were not seriously used to derive the necessary entry-level training.

Again, the conference's ROP provides clues to how these flaws persisted.

First, there was an 0207-only T&R working group held at the end of September 2015. Present were the soon-to-be AIOC director, the then-current AIOC director and assistant director, two former AIOC directors, the MAWTS-1 Intelligence Department head, two I-Dept representatives (from what would soon become IPA), and a MCIS facilitator.[432] The results of this one-day working group was merely to recommend the split of the singular air intelligence T&R event (encompassing all six functions) into six (each covering a single function).

Second, at the primary T&R working group, held three months later, in December, TECOM provided guidance that less robust or less unique T&R events be deleted or modified in

[432] Training and Readiness Working Group Chairman, *Record of Proceedings (ROP) for MOS 0207 Training and Readiness (T&R) Working Group* (Virginia Beach, VA: Marine Corps Intelligence Schools, October 15, 2015), Enclosure (2), 1.

order to retain only events that had a "specific process requirement" and that this would permit the T&R manual to more effectively differentiate unique MOSs and the unique intelligence training requirements they required to effectively support their respective communities or supported units.[433] Having already met in September, there was no MAW representation to address 0207 events. This did not stop the December working group from trying their hand at improving 0207 events. The draft events the December working group developed are enclosed with the ROP with Microsoft Word's 'track changes' feature enabled, providing valuable insight to the process. Instead of developing air intelligence events from scratch (or adopting the all-new events developed that October), the working group copied ground intelligence events, papering over their skeleton with air intelligence dressing. For example, "0203-GREC-1004: Integrate precision fires into the ground scheme of maneuver" became "0207-OPS-1002: Provide intelligence support to Antiair Warfare" and the billets identified as conducting some events do not even exist (for example, "MACCS Intelligence Chief" and "MACCS Intelligence Officer").[434]

This fifth edition of the T&R manual, then, largely shuffled around the components of previous manuals, still failing to recapture the comprehensive and tailored nature of the first.

6.D.9. Wing Intelligence Support Company

After the 36th CMC's planning guidance identifying the current and future A2AD environment as the central threat to the Marine Corps mission and calling on the Service to prioritize efforts to facilitate its ability to operate "from the sea in this Anti-Access, Area Denial … threat environment," ISR & Data Management Branch (IPI) of I-Dept's Intelligence Plans and

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[433] Task Analyst, MAGTF Training and Education Standards Division, *Record of Proceedings for the Intelligence Training and Readiness Manual Working Group 7 Dec-11 Dec 2015* (Quantico, VA: Training and Education Command, December 2015), 1.

[434] Ibid., Enclosure (2), 46-47.

Policy Division (part of which would later become IPA), presented an update to the DIRINT on the future of air intelligence under this planning guidance.[435] In it, the IPI team identified the following problem statement:

> Aviation intelligence is seen as irrelevant to most aviators. During mission planning, value added support is the exception and not the rule. Most 0231s assigned to squadrons have limited understanding of the platform they are supporting or basic foundations of [the] threat they will encounter. As technology improves, with most aircraft adding multi-sensor capabilities, relevant intelligence support is vital, from the squadron commander through the MCISRE. … Marine Corps Aviation and Intelligence now have an opportunity to get this right.[436]

The plan proposed a number of changes: to enhance F-35 support, their squadron T/Os would gain permanent intelligence officers and these would not be lieutenant 0207s, but rather captain 0277s; in an effort to improve professional development and provide for an air intelligence officer career path, the rank of MAG intelligence officers would be elevated to major; SITCC would be formalized; liaisons would be placed as MCIA, MSIC, ONI, and NASIC; F-35 air intelligence Marines would attend the USAF F-35 Intelligence Formal Training Unit; and the Intelligence WTI course throughput would be increased.

This presented a significant but ultimately incremental change to the status quo.

When the 37th CMC initiated Force 2025, the Service was directed to develop both ‘evolutionary’ (i.e., incremental) and ‘revolutionary’ COAs to address the challenges faced by the Service. The CMC’s guidance with respect to air intelligence was “Build two options short of an [Intelligence Squadron] (organic to the Wing vs. DS [Direct Support] from MEF / Intel

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435 Commandant of the Marine Corps, *U.S. Marine Corps 36th Commandant's Planning Guidance*, 10.

436 Headquarters, United States Marine Corps, Intelligence Department, IPI, *Future of Aviation Intelligence: DIRINT Update* (Washington, D.C: Headquarters, United States Marine Corps, Intelligence Department, September 3, 2015), 3.

Battalion) with a plan to migrate capability to the Wing."[437] COA 1 was a WISC under the MAW, COA 2 entailed the incremental changes proposed in 2015, and COA 3 was a WISC under the Intelligence Battalion (with plans to migrate it under the MAW after it reached Full Operational Capacity [FOC]).[438]

At the conclusion of Force 2025 Phase I, the CMC directed the adoption of COA 3 based on the "belief that the Intelligence Battalion could better establish this capability, and that it would promote better integration of new sensing capabilities of the MAW into the MEF Information Group" as an "intermediate step to eventually growing to a Wing Intelligence Support Squadron, which would then be realigned back to its respective MAW."[439] This plan was established under the assumption that the Marine Corps would be approved for growth up to 194,000. In August 2017, after this planning assumption had changed, I-Dept re-aligned the WISCs back under the MAW.[440]

The idea for the WISC is not entirely new. The general idea has received occasional support throughout the years (aside from calls to consolidate air *reconnaissance* assets in a single unit, which is *not* the same concept), though for varying reasons. The first of these appears in 2009, when Lieutenant Colonel Beau Higgins noted that Radio Battalions and Intelligence Battalions offer robust opportunities for 0206s and 0204s, respectively, to receive unit-level support and mentorship from senior Marines in the same field. Even an 0203, he noted, "comes in with the same training from [The Basic School]" (and Intelligence Officers Course [IOC]) "as

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437 Headquarters, United States Marine Corps, Intelligence Department IPA, *Wing Intel Support Company / Intel Squadron Update (Draft OAG Slides)* (Washington, D.C.: Headquarters, United States Marine Corps, Intelligence Department, April 28, 2017), 4.

438 Ibid.

439 Assistant Chief of Staff G-2, Second Marine Aircraft Wing, *Wing Intelligence Support Company Implementation Decisions* (Marine Corps Air Station Cherry Point, NC: Second Marine Aircraft Wing, October 31, 2017), 1-2.

440 Ibid., 2.

his infantry peers and is in the majority of cases more readily accepted into the fold than is an 0207 into the squadron."[441] The problem for 0207s, he stated,

> comes down to the professionalization of the [0207] MOS. Within the air wing, the 0207s are often viewed as second-class citizens because they do not have wings on their chest. … The lack of shared training with their aviation peers and the lack of mentoring available within the current command structure inhibits the ability of 0207s to reach their fullest potential.[442]

The solution Lieutenant Colonel Higgins proposed was the creation of "Intelligence Squadrons," which would provide a consolidated unit to provide improved mentorship, command opportunities, improved training opportunities, and a "safety net" for 0207s struggling to succeed.[443]

Three years later, Lieutenant Colonel George David proposed the reorganization of air intelligence into "Marine Aviation Intelligence Squadrons." Lieutenant Colonel David identified the unique knowledge and skills required to provide tailored intelligence support to Marine aviation, including unique planning and execution timelines, scale and scope, and intelligence support products. His presentation of the unique parameters of air intelligence was so comprehensive and concise that it deserves replication here:

> Intelligence support for aviation differs from that required by ground or ground logistics units. [Air intelligence] is more technical and maintains awareness over the entire MAGTF area of operations (AO) and more, while demanding heightened knowledge of specific enemy intent. Where battalion S-2s (intelligence) focus on their zones in order to support ground commanders, the squadron S-2 must assess everywhere his squadron flies, which may include areas that are well outside the MAGTF AO. Moreover, the time frame for so doing is drastically reduced because of the speed of aircraft in the battlespace. This ability entails competence at both the tactical and operational levels in addition to knowledge of threat weapons and warning structures (human or electronic) used to monitor aircraft. Use of threat zone matrices (aviation intelligence preparation of the battlespace) and helicopter landing zone matrices with predictive engagement

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441 Higgins, 33.
442 Ibid., 34.
443 Ibid., 33-34.

> envelope assessments, in addition to the daily intelligence production, all require time to assimilate. The rhythm of sortie generation, air tasking order development, mission tasking, mission prebriefing, mission reporting, battle damage assessments, and aviation reconnaissance must be thoroughly understood in order to make [air intelligence] efficient, effective, and usable.[444]

The ability of the air intelligence community to develop these unique skills and support these unique intelligence requirements is degraded by the scattering of these Marines "throughout the MAW in tiny and disparate pockets whose only commonality is their tie by MOS."[445] While the lack of air intelligence training 0231s receive is mitigated partially by the creation of SITCC, many of his other observations remain valid: in garrison, S-2s do "little but security management" and "it is rare that an intact S-2 section will conduct predeployment training with its squadron," the consequence of which is that "intelligence support to the CE is a continuously debated subject, and the 0207 air intelligence officer has difficulties with retention."[446] The solution Lieutenant Colonel David proposes is, in essence, the WISC: a consolidated unit where intelligence Marines can be trained in these special skills, including the operation of increasingly-advanced intelligence sensors, where economies of scale can be achieved with low-density specialists, such as 0241s (Imagery Analysis Specialist), and where a center of excellence can be established for air intelligence skills that complements MAWTS-1's Intelligence Department.

By some interpretations, the idea of a WISC can be traced even further back to October 1999, with the creation of Intelligence Battalions (or the SRIG and Intelligence Companies before them), intended to consolidate intelligence personnel to achieve many of the same improvements the WISC promises. These Intelligence Battalions were intended to support "the

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444 George J. David, "Marine Aviation Intelligence Squadron," *Marine Corps Gazette*, July 2012, 67.
445 Ibid., 68.
446 Ibid.

MEF and subordinate units" but failed in practice to support the ACE for all of the same reasons that slowed the improvement of air intelligence from the 1990s through today.[447]

Therefore, the WISC represents a radical change, recognizing both that previous incremental changes had all failed to solve the air intelligence credibility problem and that previous intelligence reform efforts had continually left air intelligence behind, either as a problem too poorly understood or too difficult to fix.

6.D.10. Wing Intelligence Support Company Concept of Employment

With the WISC decided upon, I-Dept began developing a CONEMP for the WISC. CONEMPs "[describe] how an organization, platform, weapon, or piece of equipment is intended to be used."[448] The WISC CONEMP

> supports, expands and clarifies the Wing Intelligence Support Company / Intelligence Squadron (WISC/IS) mission statement and provides guidance on the WISC/IS operation. This CONEMP further documents intent and outlines operational principles, assumptions, and continuing evolutionary plans for the unit. The CONEMP communicates requisite operational detail support to the development, fielding, and initial operations of the unit. Primary emphasis is placed on missions and tasks which drive material and facilities requirements. WISC/IS commander ultimately determines the daily operations of the unit and will create a training plan supporting this CONEMP.[449]

The CONEMP places WISC training "inside a deliberate continuum of training throughout the USMC that begins with raw recruits and matures Marines to true professionals and masters of their tradecraft," taking basically-trained air intelligence Marines (for officers: graduates of AIOC; for enlisted: graduates of SITCC) and other basically-trained intelligence Marines (e.g., 0261s or 0241s), and training them "to a common performance standard that

[447] Vernie R. Liebl, "The Intelligence Plan: An Update," *Marine Corps Gazette*, January 2001, 55.

[448] Marine Corps Deputy Commandant for Combat Development and Integration, *Marine Corps Combat Development Command/Combat Development and Integration Instruction 5401.1* (Washington, D.C.: Marine Corps Combat Development Command, February 8, 2016), 3.

[449] Headquarters, United States Marine Corps, Intelligence Department, *Wing Intelligence Support Company (WISC) and Intelligence Squadron (IS) Concept of Employment,* 2.

matures as their skills and responsibilities increase. Fundamentally, the WISC/IS CO is responsible to plan, validate, and execute the training and specifically certify individuals or teams to fulfill squadron or other air intelligence functions both in garrison or forward deployed."[450]

Recognizing that the pre-WISC force structure created "disparate training and proficiency levels, reactionary management, and unpredictable staffing levels, often yielding ill-prepared intelligence staff and, ultimately, an inadequately supported customer," the WISC consolidated most air intelligence Marines in a single organization that could be focused almost exclusively on providing this training to the Marines and attaching them to deploying ACE units.[451] The CONEMP lays out this new structure and how it is to work:

> The WISC is a company-level element at inception and later will upgrade to a squadron-level unit known as the Intelligence Squadron (IS). The three WISCs will have between 158 and 263 Marines created to support and service air intelligence and [Operations in the Information Environment] requirements. This includes operations support, processing, exploitation and dissemination (PED) of collected data, responding to requests for information, providing situational awareness & situational understanding, and providing indications and warning …. These functions are primarily achieved through task-organized Direct Support Teams (DSTs) that detach from the parent unit and attach to the supported wing, group, or squadron. These functions are further achieved through reachback to the garrison facilities where the unit carries out real-time mission support as well as the full intelligence process. These functions are enabled by consolidated and supervised training. To state it simply, the WISC trains and certifies while simultaneously remaining operational from garrison. The WISC Commanding Officer (CO) will train and certify air intelligence Marines to established training standards and employ them according to the Wing Commanding General (CG) priorities.[452]

The CONEMP envisions an evolution of MAWTS-1 into a center of excellence for air intelligence in the same way it serves aviation and aviation ground MOSs and their training:

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[450] Ibid, 23.
[451] Ibid., 9.
[452] Ibid., 12.

> Marine Aviation Weapons and Tactics Squadron One (MAWTS-1) is responsible for overall ACE intelligence training standardization and coordination. The WISC S-3T will coordinate with MAWTS-1 as well as MCIS and the MAW training sections to update and refine its training program and MOJT training program. To satisfy the need to create a common training standard, a MOJT program across the MAWs must also be reviewed and validated by MAWTS-1.[453]

The training conducted is for specific billets: "Individual Marines are being prepared for specific upcoming job performances based on billet and forecasted performance requirements."[454] And the training is stratified and codified by qualifications and certifications, standardized across the MAWs as a "key [driver] and [maintainer] of WISC and DST effectiveness."[455]

In sum, the WISC CONEMP presents air intelligence training at the WISC in a manner closely mirroring the Aviation T&R Program. Where the CONEMP falls short, however, is that it presents this concept of training but does not provide a method. What this method should be is central to the research questions posed by this study.

6.D.10.A. Wing Intelligence Support Company Training Shortfall

For all the benefit of the radical change that the WISC represents, it continues to have a critical gap that threatens to limit it to a reshuffling of personnel: it does not actually identify the training requirement the WISC is intended to fulfill. Nor does it provide a plan to reform air intelligence training to meet this requirement and thus provide the basis for the advanced training, qualifications, and certifications the WISC construct proposes to accomplish.

This oversight was formalized in the as-yet unreleased Marine Corps Bulletin (MCBul) 5400, directing the activation of the WISCs. The MCBul 5400 is a component of the Total Force

[453] Ibid., 30.
[454] Ibid., 27.
[455] Ibid., 30.

Structure Process (TFSP). TFSP is the source of the DOTMLPF&C framework and uses it to ensure "no aspect of the enterprise is ignored when new requirements for the USMC are identified."[456] In turn, the Training and Education pillar of DOTMLPF&C (i.e., the 'T') "examines all basic to advanced training, professional education and the various types of unit training" to include "Develop T&R manuals and standard operating procedures. … Determine MOS related qualification requirements. Determine incidental certification requirements."[457]

Thus, one would expect the T component of DOTMLPF&C in the MCBul to include some recognition of the efforts to be required to reform air intelligence training in the way envisioned by the WISC CONEMP. However, it does not, stating: "Training and Education. No unique training has been identified for the activation of WISC [2d/3d] MAW."[458]

This criticism should be tempered by the fact that Force 2025 has been a deliberately accelerated process, with the CMC accepting risk in a less thorough DOTMLPF&C analysis in exchanged for accelerated implementation. Nonetheless, the gap remains in the WISC and as the CONEMP itself states: "Of the nine mission statement core tasks, the most central is to provide task organized forces, specifically, qualified and certified forces trained and equipped to support the MAW units and, by extension, the MCISRE."[459] Thus, while it is recognized that an improved method for training air intelligence Marines is the most central task and purpose for the WISC, it has been omitted. This makes the development of such a framework (which this research attempts to do) critical to WISC success.

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[456] Commandant of the Marine Corps, *MCO 5311.1E Total Force Structure Process* (Washington, D.C.: Headquarters, United States Marine Corps, November 18, 2015), 2.

[457] Ibid., Enclosure (2), 5-8 - 5-9.

[458] Headquarters, United States Marine Corps, Deputy Commandant for Combat Development and Integration, *MCBul 5400. Activation of Wing Intelligence Support Company for 2d Marine Air Wing - WISC 2d MAW* (Washington, D.C.: Headquarters, United States Marine Corps, unpublished draft). The MCBul 5400 for 3d MAW's WISC reads identically, with the replacement of 3d MAW for 2d MAW.

[459] Headquarters, United States Marine Corps, Intelligence Department, *Wing Intelligence Support Company (WISC) and Intelligence Squadron (IS) Concept of Employment,* 12.

6.D.11. Air Intelligence Community of Practice and Air Intelligence Tactics Study Group

In August 2015, I-Dept established the Air Intelligence Community of Practice (COP) with the mission to "establish an open, collaborative, action officer level forum within the aviation community and the MCISRE in order to advocate for and further improve intelligence support to aviation."[460] However, because the COP met exclusively by Joint Worldwide Intelligence Community System (JWICS) Video Teleconference (VTC), this largely excluded participation by MAG and squadron echelons (most of whom do not have ready access to JWICS VTCs) and resulted in a COP which largely focused on long-term plans and programs (such as the provision of counterintelligence support to F-35 units, the acquisition of machine learning capabilities, or the creation of the WISC). In an effort to provide the community an analogous forum focused on shorter time horizons and more accessible to company-grade officers, Non-Commissioned Officers (NCO), and SNCOs, I proposed a derivative of the COP, (the AITSG) to meet by Secret Internet Protocol Router Network (SIPRNet) VTC (all MAGs have SIPRNet VTC capabilities, enabling every squadron to participate through their parent MAG). This concept was approved and endorsed by I-Dept IPA, as the COP Sponsor, and the first AITSG was held in July 2017.

One of the obstacles to improving air intelligence has been inadequate documentation of air intelligence tradecraft (i.e., Tactics, Techniques, and Procedures [TTP], best practices, and SOPs—a professional body of knowledge) that, "despite years of refinement and implementation," are subject to informal knowledge management and are therefore routinely lost

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[460] Aviation Intelligence Community of Practice Sponsor, *Aviation Intelligence Community of Practice Standing Operating Procedures (SOP)* (Washington, D.C.: Headquarters, United States Marine Corps, Intelligence Department, August 20, 2015), 1.

or severely limited in dissemination.[461] Thus, the mission of the AITSG is to "[match] Operating Forces (OPFOR) capacity to OPFOR requirements to identify, develop, continually improve, document, store, and disseminate emerging Tactics, Techniques, and Procedures (TTPs), standards, training, and best practices (collectively: tradecraft) for deployed and pre-deployed Aviation Combat Elements (ACE) in any size MAGTF."[462]

The AITSG sought to create and disseminate standardized air intelligence tradecraft "to provide a common baseline that facilitates interoperability (between air intelligence Marines with different backgrounds and between those intelligence Marines and the aviation planners they support) and [ensure] a minimal level of quality."[463] To do so, the AITSG meets monthly to identify standardization requirements, identify potential existing resources to facilitate the development of standards and to vet those standards through real-world and exercise use. The AITSG also provides some of the functions of a provisional 'center of excellence,' providing a locus for discussion, engagement, debate, and a repository of knowledge and resources across the entire air intelligence community. While it remains a voluntary forum for OPFOR air intelligence Marines to participate in, it was endorsed by both I-Dept IPA and MAWTS-1 and was formally taken over by MAWTS-1 in January 2019 (formalizing its 'center of excellence' functions).

6.D.12. Marine Corps Intelligence Schools FY2018 Plan of Action

Writing in 2010, Major James Breasette noted:

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[461] Christopher A. Denzel, "Professionalizing Air Intelligence, Part III: The Air Intelligence Tactics Study Group (AITSG)," *Marine Corps Gazette*, September 2018, 34.

[462] Aviation Intelligence Community of Practice Sponsor, *Aviation Intelligence Tactics Study Group (AITSG) Charter* (Washington, D.C: Headquarters, United States Marine Corps, Intelligence Department, June 13, 2017), 1.

[463] Denzel, "Professionalizing Air Intelligence, Part III: The Air Intelligence Tactics Study Group (AITSG)," 35.

> Within the Marine Corps intelligence community, there is no process designed to formally chart the progress of intelligence Marines through a specific criteria of scaled and certified skills progression. Because of this fact, there is no way to impose consistent intelligence performance standard or comprehensively evaluate the effectiveness of the Marine Corps' intelligence training continuum.[464]

Major Breasette called for "The creation of a defined body of knowledge, designated by specific skill areas and further subdivided into detailed supporting knowledge-based task lists which are then stratified by assigning a relative degree of difficulty and/or required skill level," which will "provide a pathway for Marines to follow from entry-level novice to eventual master."[465] A problem that Marine aviation first identified in the 1960s and had established a framework to address in 1970s still persisted in Marine intelligence, fifteen years after the establishment of the Ground T&R Program.

This problem is large—requiring a review of virtually all intelligence billets in the Service. However, the first tangible steps towards addressing this were taken with the *MCIS Plan of Action for FY2018*. Beginning with the foundational concept that "success on the future battlefield rests primarily on the competence of the individual Marine," the plan concludes that to be effective in developing the competent individuals necessary in the Service,

> requires each organization to share a common vision, to understand their part in a Marine's career-long transformation, to understand how individuals combine to teams and units to accomplish a mission, and to share their resources and expertise irrespective of organizational boundaries. Unfortunately, this is not the current state.[466]

To achieve this, the MCIS plan establishes four lines of operation: "Solidify the Foundation," which "ensures that we have our requirements correct and the resources we need to

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[464] James L. Beasette, "Intelligence Skills Progression, Certification, and Tracking," *Marine Corps Gazette*, September 2010, 20.

[465] Ibid., 24.

[466] Commanding Officer, Marine Corps Intelligence Schools, *Marine Corps Intelligence Schools Plan of Action for FY-18* (Dam Neck, VA: Marine Corps Intelligence Schools, December 8, 2017), 1

accomplish the mission;" "Billet-based Training," which "seeks to examine each intel-related BIC and then describe the knowledge and skills expected of an individual filling that billet;" "Persistent Learning Environment," which combats the concept of a single "inoculation of training" at entry-level schools by "[allowing] Marines to not just learn their current job, but also the jobs they anticipate or aspire to;" and "ISR Simulator," which entails "the use of simulation and virtual reality to replicate the operational environment and all of the entities within it."[467]

Notably, these four lines of operation almost perfectly capture the main threads of training reform achieved by Marine aviation.

While MCIS has comparatively limited unilateral authority outside of the formal intelligence schools, this articulates a coherent and comprehensive vision for intelligence training across the Service and across the training continuum (from formal courses to MOJT) that informs Marine intelligence training reform efforts. If implemented and adequately resourced, the training concept this plan represents would address Major Breasette's call for a defined career and training progression and bring the broader Marine intelligence community more closely in line with the successful training reforms achieved by Marine aviation.

6.D.13. 2010s Summary

The history of the 2010s is in small part richer because it is more recent and therefore more documentation is available. However, a look at not just the debates and discussions about changes that took place, but the enduring changes accomplished show a decade more productive than any time in the past: the creation of SITCC, the establishment of a tactical intelligence SOP, the (re)creation of a doctrinal publication, and the development of the WISC. As either cause or

[467] Ibid., 1-3.

effect (or both), this decade also marked the first serious participation of HQMC AVN in air intelligence reforms with its support of SITCC and the WISC.

It is likely that the relative decline in operational tempo from the 2000s as well as the time to observe where the Van Riper Plan fell short allowed for the air intelligence community to begin making serious reform efforts at a scale not seen in previous decades.

Despite these steps forward, however, it is also clear that the air intelligence community was still trying to solve what was fundamentally the same problem: air intelligence Marines lacked the training necessary to provide value to aviation mission planning, briefing and execution. The SITCC and WISC are excellent examples of this continued attempt to solve the same basic problem.

While SITCC resulted from an attempt to address the ‘vicious cycle’ of irrelevance identified in *Alert and Ready*, it ultimately did so only by addressing one component (entry-level training) of one element of the population (enlisted Marines). Thus, the same evidence (the RAND study) was used to solve the same problem (lack of training leading to lack of credibility) for SITCC in 2011 and the WISC in 2016.

Where air intelligence Marines did succeed in making progress, much of their success was due to personality-driven factors, sometimes despite their organization.

Additionally, the reforms achieved in the 2010s were not integrated and, in many cases, met with significant community or institutional apathy. For example, as much of an improvement as the SITCC was, for most of its life (from 2011 through at least 2015) 2d MAW headquarters still relied almost entirely on subordinate MAGs to find instructors, schedule instruction facilities, solicit attendees, and coordinate with external agencies. Thus, SITCC’s success or failure relied on the personal drive (or lack thereof) of these junior officers. The intelligence course at WTI is still not meaningfully linked to the OPFOR or any training that takes place there (in part because there is an absence of any formal training requirements beyond entry-level) and the entry-level schools are not coherently nested within a broader career progression or concept (because neither exist). And the community, while recognizing the value of the ACEINTSOP and MCRP 2-10A.9, continues to display apathy towards efforts to improve, maintain, or disseminate them.

Ultimately, the WISC represents the most coherent vision for reform encountered to date. Beginning with the assumption that reforms to date have failed, it takes a radical approach by reorganizing the entirety of MAW intelligence structure. But even this accomplishment is tempered by two facts: until Force 2025 demanded a revolutionary COA, the recommended changes were incremental; and the WISC construct falls short of a complete reform because it does not include or fall within a coherent and comprehensive air intelligence concept and, as a consequence, omits training and combat readiness elements—the primary reason for creating the WISC in the first place.

6.E. Summary

Before 1989, it would have been inappropriate to discuss the state of air intelligence in the way in which it is understood today (as intelligence support to a force capable of directly achieving MAGTF objectives). Until Operations DESERT SHIELD/DESERT STORM, the ACE was not conceived of as a maneuver element. It was not until the Van Riper Plan, with the creation of an air intelligence MOS (even if one only limited to lieutenants and, therefore, the first few years of an officer's career) that it becomes reasonable to expect the Service to take air intelligence training (or reform) more seriously.

But even then, air intelligence was disadvantaged by an era of Marine combat where the risk to mission and risk to force from a mishap far outweighed any threat posed by the enemy. The consequence was an intelligence community that failed to keep pace with the aviation community it supported. While the lack of a serious threat during this era might seem fortuitous for Marine aviators, it remains to be seen whether air intelligence will be able to catch up before the next major conflict where combat losses will be more common.

Throughout the years, a number of individuals have attempted to make headway in improving air intelligence. Historically, these have been "unit-driven, based on immediate requirements," "perishable," and "driven through personality-based, intuitive decision making."[468] This lack of coherent or comprehensive strategy for change in air intelligence has been due to a number of factors, the most obvious of which is the lack of an operational imperative (i.e., the threat of air superiority being challenged or denied). These factors were aggravated by repeated institutional apathy. Certainly, also the Ground T&R Program is to blame, focusing so myopically on DRRS-reportable training that most unit G/S-2s were left behind, giving ACE intelligence a T&R manual with only entry-level events that is all but unusable to train Marines to support their unit.

For any and all of these reasons, and others not listed, air intelligence has failed to become a mature learning organization and has determinedly attempted to solve the same problem—the lack of credibility and proficiency of air intelligence Marines—over and over again for twenty-five years, each time developing a new solution (an 0277 MOS, then AIOC, then SITCC) and making incremental improvements but failing to fundamentally address the root cause: inadequate training. Even in the T&R manual, where air intelligence events have

[468] Marine Corps Director of Intelligence, *MCISRE Decision Memorandum 3-17 Marine Corps Intelligence, Surveillance, and Reconnaissance Enterprise Supporting Strategy for Aviation Intelligence*, 3.

been revised with each version of the manual, the substance of the events has remained almost unchanged between the second and fifth versions of the manual.

It is tempting to look at the current moment as an inflection point. Marine aviation, for the first time in decades, is regularly flying within the engagement envelopes of serious air threats, if not actually against them. In the last few years in Syria, Marine aviation has been inside one of the most advanced and densest IADS on the planet and flown in the same airspace as fifth generation Russian fighters. Hopefully, this generates the visceral understanding of the shortfalls of Marine air intelligence that are normally only associated with combat losses, focusing Marine air intelligence on catching up in a thirty-year evolution of Marine aviation that has so far left ACE intelligence behind.

Judgement as to whether this is so will not be possible until years into the future. However, for the first time since the Van Riper Plan, the WISC presents air intelligence with a reasonably complete and comprehensive vision that links the entire continuum of support to the combat formations air intelligence Marines will support in an institutionally-accountable manner (i.e., in a way that relies on more than just a commander’s personal interest). This provides air intelligence clarity on the road ahead, if not certainty.

What is left is to develop that continuum of training along with the processes and infrastructure to support it. Chapter 7 structures and analyzes the shortfalls highlighted by this history, identifying distinct areas for reform that are likely to improve air intelligence.

CHAPTER 7

ANALYSIS

As described in Chapter 4, this research uses the CMM to understand how and when an organization becomes a learning organization, gaining effectiveness and efficiency, and therefore becomes able to institute effective reforms.

Originally designed to address issues in software development and acquisitions, the CMM provides a strategy for process improvement program development that provides a path "[increase] an organization's … process maturity in stages."[469]

The CMM describes five stages of process maturity (depicted in Figure 1, in Chapter 4):

> **1) Initial**. The software process is characterized as ad hoc, and occasionally even chaotic. Few processes are defined, and success depends on individual effort.
> **2) Repeatable**. Basic project management processes are established to track cost, schedule, and functionality. The necessary process discipline is in place to repeat earlier successes on projects with similar applications.
> **3) Defined**. The software process for both management and engineering activities is documented, standardized, and integrated into a standard software process for the organization. All projects use an approved, tailored version of the organization's standard software process for developing and maintaining software.
> **4) Managed**. Detailed measures of the software process and product quality are collected. Both the software process and products are quantitatively understood and controlled.
> **5) Optimizing**. Continuous process improvement is enabled by quantitative feedback from the process and from piloting innovative ideas and technologies.[470]

Implied in this framework is the necessity to progress through stages sequentially or simultaneously (i.e., it is not possible to omit stages).

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[469] Paulk et al., 5.
[470] Ibid., 8-9.

7.A. CMM Analysis of Marine Aviation Training

With respect to the training and education pillar of DOTMLPF&C, Marine aviation can be viewed as having progressed through all five stages of CMM during the scope of the first case study.

7.A.1. CMM Stage One

With the transition from Phase Training to Level Ready Training in the 1960s, Marine aviation's training processes were, in a way, reset. An entirely new model of training progression required the development of new processes as well as the workforce to implement and manage them.

This began with an ad hoc or chaotic process of MAW-specific T&R manuals that, at best, led to some repeatable localized processes. These manuals, as well as standardization boards, even provided some 'defined' localized process improvement characteristics. But from the perspective of the Service, there remained no standards or definitions for training or readiness, leading to Lieutenant Colonel McClure's observation in 1961 that a pilot with the ultimate training qualifications on one coast might PCS to the other coast and find him or herself "barely qualified to fly solo."[471]

7.A.2. CMM Stage Two

The adoption of a Service-wide aviation T&R manual in 1967 pushed the Service into the second stage of the CMM. But without objective standards tied to these T&R events, as late as 1970, the Service maintained a "bogus T&R posture" that, for example, allowed pilots to be qualified in weapons delivery even if they routinely missed the target by greater than the

[471] McClure, Jr., "One Book for Aviation," 60.

weapon's CEP.[472] This provided the Service a repeatable training process, but one which lacked defined standards.

7.A.3. CMM Stage Three

When these metrics were finally included in the T&R manual and it's supporting references, the Service achieved the third, 'defined' stage of process maturity. Crucially, the second stage had established Service-wide publications that could then be updated with these defined requirements (e.g., the T&R manual, NATOPS manuals, doctrine, NTTPs). This enabled the Marine aviation community to not only identify shortfalls but to make recommended changes to existing documentation that addressed those shortfalls through a disciplined change-management process.

7.A.4. CMM Stage Four

The publication of the WTTP and establishment of MAWTS-1 in the 1970s finally gave Marine aviation a center of excellence that could manage, inspect, and exert quality control across all MAWs and all TMSs. This pushed Marine aviation into the fourth stage ('managed') of process maturity. The process maturity role of MAWTS-1 was supported by the legal and policy authority of the WTTP as well as integration of this center of excellence (from MAWTS-1 through its 7577 WTIs, into subordinate instructors, and down to the aviators and aircrews being trained) along the continuum of training and across all units and echelons.

7.A.5. CMM Stage Five

As MAWTS-1 grew into its role, its ability to continually improve processes was enhanced by its newfound authority within Marine aviation. Where once T&R conferences were subject to a commander's "apathy," attended by "marginally qualified personnel," they would

[472] Ivy and Vest, 50.

eventually be attended by 7577 WTIs and other vetted leadership from within the OPFOR, already indoctrinated into the process improvement program in which they were participating as conference attendees.[473] The authority of MAWTS-1, once it developed, could be used for Marine aviation to identify changes, implement them through MAWTS-1, and have subsequent implementation in and feedback from the OPFOR, establishing Marine aviation training at the 'optimizing' fifth stage of the CMM.

The shift to 'core competencies' and the articulation of a detailed CMMR in the mid-1990s put further emphasis on using the T&R manual to generate readiness explicitly through T&R completion. This also created an imperative for the T&R manual to be an accurate description of training and readiness requirements rather than a *pro forma* document that existed to have its requirements pencil-whipped. As time went on, further optimizations were made, such as: expanding the WTI course to cover aircrew and aviation ground MOSs, creating the ATS, including NMOSs for flight leadership qualifications, and so on.

The steady stream of improvements, consistent use of established structures (e.g., MAWTS-1, doctrine, T&R manuals), and the expansion of these processes or structures to broader areas of responsibility (e.g., expanding the WTI course to encompass rotary-wing platforms and enlisted aircrew) are indicators of an organization with a coherent vision of employment, an established process structure for its needs, one which continues to optimize and seek out new efficiencies, and one that institutionally values processes and process improvement.

7.A.6. Contributing Structures for Process Improvement

The CMM, when overlaid onto the history of Marine aviation training reform, also helps to identify what specific changes precipitated a move from one stage to another.

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[473] Durnford, Jr. and Silard, Jr., "Aviation Training and Readiness." *Marine Corps Gazette*, May 1970, 37.

Moving past the first stage required not just a Service-wide T&R manual, but one that effectively described the entire continuum of training for aircrew from their first day at the FRS to achieving the ultimate qualification of flight leader.

Moving past the second stage required that the Service-wide T&R manual and its supporting references include clear standards and a framework for measuring them (e.g., standards for event performance, qualified instructors necessary to evaluate events).

Moving past the third stage required the establishment of an authoritative center of excellence. Critically, this entailed more than simply establishing the unit and giving it a mission (as was the case with the MAWTUs, whose utilization still depended on unit commanders' interest). Making the center of excellence meaningful and impactful required the complete integration of it and its mission into the institutional structure of the organization, including the T&R manual and, by extension, unit readiness reporting. This not only forced OPFOR units to adhere to policies and procedures dictated by the center of excellence but also aligned the incentives of OPFOR units (readiness reporting) to the mission of the center of excellence (establishing the training requirements and standards necessary for operational readiness). This paradigm parried the tendency of large organizations to perform in the way in which they're measured from the sclerotic bureaucracy one might expect into a positively-reinforcing construct.

Moving past the fourth stage, to the optimizing stage of the CMM, necessitated time. The potential in Marine aviation was only fully realized when the pathways of optimization became well-tread. Prior to the establishment of MAWTS-1, T&R conferences were attended by "marginally qualified personnel," retarding the process of improving the T&R manual.[474] The

[474] Ibid.

creation of MAWTS-1 in and of itself did little to change this. It was only after MAWTS-1 had proven its value to the Marine aviation community that it achieved the esteem in which it is held today. That esteem is, in part, what incentivized commanders to send their most qualified personnel to these T&R conferences and what incentivized individuals to seek orders to MAWTS-1 as instructor pilots.

As the system optimized, it became self-reinforcing, furthering optimization. The more central the T&R manual became to a unit's ability to report operational readiness, the more seriously units took the T&R manual. The more seriously the units took the T&R manual, the more important it was that it be kept up to date and optimized.

Thus, the following major features enabled Marine aviation to achieve an optimizing state as an organization:

- a comprehensive and objective T&R manual that describes a persistent training continuum from entry-level through MOJT to a capstone qualification (i.e., WTI)
- the creation of a center of excellence (i.e., MAWTS-1) with the explicit mission and authority (through the WTTP) to oversee management of Marine aviation training
- the rigorous training and standardization of instructors and the use of instructor trainers to manage unit training plans (i.e., executing the WTTP)
- the articulation of CMMRs directly linked to readiness reporting requirements (to enforce adherence to the T&R manual)
- a concept for complete integration of all these efforts across all units and at every echelon of Marine aviation (through MAWTS-1 and the WTTP)

This mutual reinforcement created a productive interdependence between the center of excellence and the OPFOR it supported, enabled a coherent and comprehensive concept of Marine aviation training, and added more value than perhaps any other single element. Thus, the center of excellence not only produced 7577 WTIs but also served as the manager of the T&R manual and supporting publications; 7577 WTIs not only served as instructors, instructor trainers, and training program managers but also as liaisons between OPFOR units and the center of excellence to ensure training was operationally validated on a continuing basis; the T&R manual was not just a document from which to derive training plans, but one that spelled out the training readiness metrics for a unit to be able to report operational readiness.

7.A.6.A. A Concept for Marine Aviation Training

Marine aviation never appears to have developed an explicit overarching concept (although the six functions of Marine aviation and how they support the warfighting functions addresses this concept implicitly). However, as training reforms progressed and the Aviation T&R Program was developed, it served a purpose similar to a concept within the realm of training.

The program manual described, in a comprehensive and coherent way, how training was conducted. It linked the ends supported (Marine aviation operational readiness as defined by the ability of aviation units to execute their METLs) with the ways described by the program manual. The program manual (and the individual TMS T&R manuals under its purview) outlined career progression, sequences of qualifications (each comprised of sequences of events), the role of the FRS, OPFOR, and MAWTS-1 in training, the role of 7577 WTIs and subordinate instructors, and how all of these linked together to ensure training supported every aspect of Marine aviation and, ultimately, the mission.

This ‘concept’ ultimately identified the capabilities and requirements (with respect to training) necessary to support Marine aviation. It also, in turn, allowed the means (individual units and the Marines within them) to execute this training in a fashion that integrated the entire Marine aviation enterprise. (Marine aviation would eventually develop the annual *Aviation Plan*, which would provide an annual strategy for how the Marine aviation community supports the

Marine Corps, to include general references to supporting training initiatives. This plan serves to integrate the full spectrum of Marine aviation DOTMLPF&C in support of the Service.)

The program manual, as a de facto concept, was critical for integrating the other four structures for process improvement, ensuring not only that they were coherent (i.e., consistent throughout the entire Marine aviation community, from FRS to MAWTS-1) but also comprehensive (ensuring that the full scope of training requirements necessary to support Marine aviation was addressed).

7.A.6.B. The Aviation T&R Manual

Aviation T&R manuals evolved in complexity and length over the years; however, by providing a training continuum across the career of an aviator or aircrew, they became essential in developing unit training plans. This was augmented further by the requirement for 7577 WTIs to instruct and evaluate events in the manual (explicitly integrating MAWTS-1 as the center of excellence and inserting a mechanism to enforce adherence to the WTTP), the inspection of training programs by MAWTS-1 periodically through fleet support visits, and the explicit linkage of objective measures of T&R completion to operational readiness. This last element perhaps is the most important institutional mechanism to enforce standards-based training.

Training readiness requires a defined number of aviators and aircrew current in a defined set of qualifications. The standards to achieve these qualifications and maintain readiness are prescribed in detail in the T&R manuals and the references for events (e.g., NATOPS or NTTP) and currency is explicitly defined by a timeframe in which that event must be demonstrated. The evaluation of these events has an inherent degree of subjectivity because an instructor must evaluate a wide variety of performance against a binary standard (i.e., to standard or not to standard, qualified or not qualified). But this subjectivity is normalized across the force by various instructor standardization efforts (e.g., WTIs, FLSEs, standardization officers, fleet support inspections, ATS).

Furthermore, every single flight, in training or combat, is coded and tracked (via M-SHARP) for all T&R events conducted, creating a detailed audit trail that facilitates an operations officer tracking readiness as much as it facilitates a MAWTS-1 instructor pilot conducting an inspection of the training program.[475] And because this must all feed into operational readiness, both over-burdensome standards (which require excessive waivers to maintain readiness) and inadequate standards (which result in risk commanders are unwilling to accept) enter into a feedback loop (through unit standardization boards, unit flight SOPs, 7577 WTI liaisons to MAWTS-1, and eventual revision of the T&R manual or supporting documentation), resulting in a T&R manual that is responsive to organizational needs, demonstrating characteristics of the fifth stage of the CMM.

Ultimately, the characteristic that most stands out about the Aviation T&R Program Manual is the degree of standardization and the detailed framework for execution it offers. This is evidenced not only in the areas one might expect (e.g., what components of events are or are not waiverable) but also extends to templates for calling messages for T&R conferences, agenda templates for those conferences, messages requesting concurrence from various Service elements, and so on. While this may seem to be excessive standardization to some, it serves at least two important process improvement purposes that compensate for the Service's high turnover rate. First, such standardized details free up Marines to expend their energies on the specific requirements of their mission, whether combat, preparing for an upcoming T&R

[475] M-SHARP is "the training management system for scheduling and logging [aviation and aviation ground] T&R Events, comparing logged data to [unit] readiness metrics, and formatting readiness data within [Aviation] T&R Program Manual guidance." Commandant of the Marine Corps, *NAVMC 3500.14D Aviation Training and Readiness Program Manual*, 1-3.

conference, or finding new ways to improve processes. Second, it provides a vehicle for institutionalizing improvements to the process (i.e., providing a baseline or process that can be improved). Thus, even these small, simple mechanisms are boring but essential tools for ensuring process improvement occurs across PCS cycles and as Marines leave active service.

7.A.6.C. The Center of Excellence

MAWTS-1, as the center of excellence, serves as a nexus for expertise and the cultivation of institutional knowledge, but also carries the authority to mandate necessary changes. As an external actor (i.e., not an OPFOR unit), it is not burdened in the same way (i.e., in readiness reporting) by the standards it enforces, allowing it to more easily make objective and long-term decisions regarding standards, balancing the positive outcomes they will have with the resource investment necessary to meet them—even if those outcomes are only apparent over time. Yet the ability of unit commanders to waive requirements when they cannot be met, the fact that MAWTS-1 staff eventually return to the OPFOR (and will therefore be burdened by the standards they create), and MAWTS-1's role in *sponsoring* a T&R manual (and standards) that ultimately are *authored* by the OPFOR are all realities that act to prevent MAWTS-1 standards from being unrealistic or excessive.

The nature of a center of excellence outside the OPFOR allows it to focus on community improvement, giving it both stake and continuity in process improvement initiatives without the distraction of having to meet deployment requirements (a demand that wins out when there is resource competition between primary and secondary missions). And the mission to do so is supported by the formal authority of an MCO (the WTTP), 7577 WTIs who serve as informal liaisons in the OPFOR, and the fact that Marine aviation has culturally accepted MAWTS-1 as a center of excellence, adding a degree of informal authority. This all weaves MAWTS-1 and the

7577 WTIs it produces into the daily lives of squadrons, formally and informally, and establishes multiple feedback mechanisms that enable the optimization described by the fifth stage of the CMM.

7.A.6.D. Instructors and Instructor Standardization

The standardization and training of instructors acknowledges the subjectivity inherent in a wide variance of human behavior (i.e., execution of training) that must be evaluated against binary criteria, adding objectivity back into this equation in a variety of ways.

This was first done through the SWDUs, then SWTUs, then MAWTUs. These were all ultimately informal, non-mandated, or otherwise limited solutions, with squadrons still able to generate readiness and deploy without participation. The evolution to MAWTS-1 and the WTTP not only expanded this instruction role across all of Marine aviation (beyond fixed-wing units), but also made the use of such instructors mandatory.

As T&R manuals evolved and grew in complexity, so too did the role of instructors within the framework. The system incorporates not one kind of instructor but a wide variety of them, including instructor trainers. In turn, MAWTS-1 fleet support visits inspect these training programs (and the instructors and 7577 WTIs that run them) and MAWs implement instructor standardization requirements through the ATS.

This instructor framework has obvious linkages back into MAWTS-1 as the center of excellence, but also mutually supports the T&R manual as the document which prescribes the necessary type and number of instructors, where they must be involved, and to what standards they must evaluate. This continued evolution and the increasing connectivity between the instructor framework and every element of Marine aviation training demonstrates an achievement of the fifth stage of the CMM.

7.A.6.E. Core Model Minimum Requirements

The articulation of CMMRs, while a component of the T&R manuals, is an explicit linkage from Marine aviation training to the outputs necessary for the units to fulfill their mission on behalf of the Joint Force or the MAGTF to which they are attached. The structure of a CMMR, defining the personnel and training necessary to complete a mission, applies a rigorous troop-to-task analysis of just what it is a unit must be capable of. This not only sets the requirements for training but enables commanders to quantify risks when faced with resource shortfalls.

By comparison, an infantry battalion cannot easily measure or describe the impact of one fewer squad leader against the mission requirements leveraged on the unit. Indeed, if this occurred, the unit would simply promote a fire team leader to the position and accept the risk of a three-Marine fire team within that same squad (without the ability to clearly quantify this risk). While the loss of one Marine may not measurably impact the battalion's ability to conduct its mission, the inability to quantify that impact also means an inability to identify the threshold when the loss of personnel does affect the battalion's ability to accomplish its mission.

The CMMR allows a squadron commander to identify how many fewer sorties per day could be sustained if the squadron were short one crew chief or one pilot. This allows the squadron to better prioritize training but also to accurately communicate the unit's combat power to the MAGTF for necessary adjustments in planning (or to allow the MAGTF commander to accept the resultant risk of flying sorties with under-qualified personnel or under-crewed aircraft).

While this benefit may seem abstract, it has the tangible effect of driving every minute of the squadron's training day, from the prioritization of maintenance to sortie planning to whether or not to approve a Marine's leave request. This detail also allows the current T&R manual to be quantified in review, with the ability to conduct precise adjustments to the crew number or training qualifications necessary to provide the required sortie outputs. Such precision enables training to be no more and no less than is necessary, and for the T&R manual to be precisely calibrated to the realistic training requirements necessary to meet combat output standards. The ability to conduct this calibration and the evidence of it occurring (see the change from Figure 7 to Figure 5) demonstrate an organization at the fifth stage of the CMMR.

7.A.7. The Inadequacy of Unit Commanders to Effect Institutional Change

The system that has resulted from the Marine aviation training reform efforts demonstrates that Marine aviation has achieved the ultimate state of process maturity in the CMM. But as recognized at the end of Chapter 5, today's system would likely be seen as overly complicated and unnecessary to most aviators from the 1960s. It should be no surprise then, that ground MOS communities would be equally as skeptical of such a complex system. Indeed, it is not uncommon for ground Marines to scoff at what appears to be excessive standardization in Marine aviation. This reaction is as much due to ignorance of how Marine aviation process optimization works as it is the dogma that commanders must be provided maximum flexibility when it comes to decisions about the unit they command, to include those related to training.

This research can do little more than it already has to reduce this ignorance. But it can explicitly address what Marine aviation has learned about the shortfalls of unit commanders with respect to effecting institutional change.

Unit commanders excel at solving unit- or mission-specific challenges. But despite the high esteem and responsibility that Marine Corps culture places on unit commanders, 'command interest,' or a commander's judgment, Marine aviation has learned that reliance on commanders is inadequate for solving *institutional* problems.

Whether because of lack of authority (over adjacent or higher units), lack of incentives (i.e., OPFOR commanders tend not to be evaluated on their impact to the Service), or for other reasons, it has been clear to Marine aviation for nearly seven decades that OPFOR commanders cannot be relied upon to solve institutional problems. Marine aviation discovered that this class of problem must be solved by organizations with the institutional authority to force change, sometimes against the (perhaps myopic) wishes of OPFOR commanders but in the best interests of the Service over the long run (and with sufficient room for flexibility and feedback).

The acknowledgment that this task cannot be left to commanders alone can be attributed, in part, to the fact that meaningful reform takes time and often requires many incremental, optimizing improvements. Even revolutionary changes, such as the creation of the first Service-wide T&R manual, must be followed up by iterative changes to refine and adapt to new dynamics in the Service or the unforeseen consequences of change achieved. None of the changes described in Chapter 5 happened over night and no one unit or individual's vision completely survived implementation without the need for adjustment. No single process improvement in Marine aviation was completely realized during the tenure of any one individual or commander. Each required many years from genesis to implementation (and years beyond that for stabilization and optimization).

Because of this, successful institutional change is virtually impossible when left to any one individual or command. It is only possible by instituting effective processes that enable the *organization* to drive change over time. Marine aviation achieved this by developing the organization's ability to gain and maintain institutional knowledge by creating a learning organization that could successfully progress through the CMM over decades, multiple careers, and constantly rotating personnel at all echelons.

7.A.8. Additional Marine Aviation Analysis

The history of Marine aviation training reform also highlights a number of features not strictly within the CMM framework but that have potential relevance to air intelligence training reform.

The Aviation T&R Program is much more focused on individual T&R events than the Ground T&R Program. Even leadership events that imply the conduct of collective action (e.g., any division leader events necessitate the direction and control of the other aircraft in the division) are written as individual events, effectively making the collective event the task of the leader.

This requires an assumption that a unit can operate effectively as long as the individuals in it are proficient in their duties, without special regard to the ability of any combination of those individuals to work together or their experience doing so. It is not clear whether this assumption is valid or invalid for ground MOSs, generally, or air intelligence, specifically.

The result of this approach is that the standards for training readiness are far more objective in the Aviation T&R Program, as individual competencies can be more easily isolated and therefore measured against a standard. In the Ground T&R Program, it is possible for a unit to demonstrate proficiency in collective events and then for the majority of those personnel to be replaced without the *unit* necessarily losing its proficiency evaluation. If a squad is evaluated on a squad collective event and the squad leader departs the unit, the squad's proficiency is still measured as the same. This is not so in the Aviation T&R Program—proficiency is tracked by individual and is therefore either present or not based upon the composition of the unit at any moment in time. If an assembled aircraft crew is proficient for a mission and the aircraft commander departs or is replaced with an unqualified co-pilot, that crew is immediately considered not proficient.

The other consequence is that because the Aviation T&R Program spreads individual events across a wide spectrum of available codes (i.e., from 1000- to 6000-level), it is easier to facilitate a logical training progression model (see Figure 20), to include branches of training progression only required for certain non-common skills (i.e., Core Plus) or instructor qualifications that, while essential to the squadron, are not essential to any one individual.

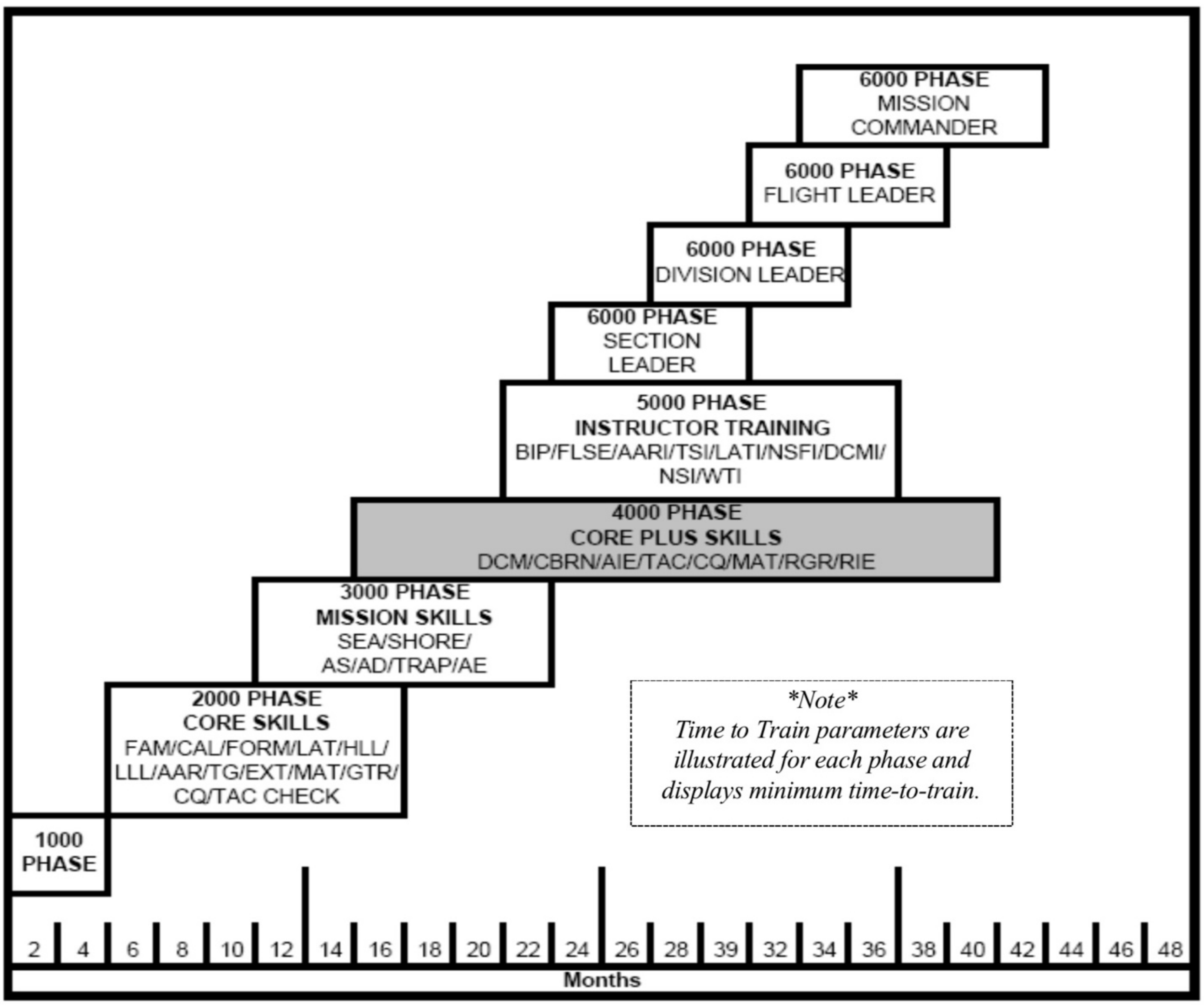

Figure 20. MV-22 Pilot Training Progression Model. Commandant of the Marine Corps, NAVMC 3500.11E MV-22B Training and Readiness Manual, Enclosure (1), 2-3.

By comparison, because all individual MOJT events in the Ground T&R Program are 2000-level, the skills of a new lance corporal 0231 or second lieutenant 0207 and the skills of a master gunnery sergeant 0231 or lieutenant colonel 0202 are all 2000-level codes. This makes the structuring of any clear individual skills progression less clear.

Additionally, aviation T&R manuals, to include unit METLs, are maintained and updated with some frequency (i.e., every few years). This makes it important for any T&R manual that derives its events from supported aviation unit METLs to regularly review supported unit METLs and adjust the supporting T&R manual accordingly. For example, any syllabus developed for VMM intelligence Marines in 2017 would have developed corresponding intelligence T&R events that support six Core and four Core Plus METs, including MCT 6.2.2. In 2018, however, VMMs reduced their Core METs down to five (and increased Core Plus METs to five) and exchanged MCT 6.2.2 with MCT 4.3.8. Thus, a derivative air intelligence T&R syllabus for VMMs would require corresponding adjustment. At a minimum, this requires regular review of supported unit METs. A more proactive approach might be to incorporate air intelligence representation at supported unit T&R conferences and working groups in order to both understand the rationale for the changes and to initiate corresponding air intelligence T&R changes that can be published (formally or as interim guidance) at the same time as updates to the supported unit T&R manual.

7.B. CMM Analysis of Marine Air Intelligence Training

Against the backdrop of Marine aviation training reform, it is clear that Marine air intelligence has failed to become a learning community and has achieved few processes to capture and institute improvement. The result of this has been the regular atrophy of knowledge gained, improvements that had lingering or unaddressed counterproductive consequences, and a general failure to fully appreciate either the scope or nature of the problem or its history. This has manifested in numerous ways, including: forgetting about Lieutenant Colonel Ingram's concept for air intelligence support to Marine aviation, forgetting about the first Intelligence T&R Manual, the underdevelopment (and relatively static nature of) the T&R manual despite regular superficial change, and the dearth of study of the subject of air intelligence (both in professional journals and in scholarship).

This lack of institutional knowledge, coupled with the lack of a serious air threat in conflicts since Vietnam, has invited and permitted the neglect that characterizes the history of Marine air intelligence.

7.B.1. CMM Stage One

Over the years, even when reform efforts succeeded (as in the creation of the 0277 MOS, AIOC, SITCC, the ACEINTSOP, and MCRP 2-10A.9), these efforts failed to adequately address the problems they sought to solve and were not integrated across the community, sapping their potential by failing to establish universal support. Many of these efforts were met with institutional apathy and required significant individual effort to be achieved. Only after it became obvious that even these successes all attempted to address the same fundamental problem (which remained) did the air intelligence community acknowledge that radical change was necessary (and even then, only after encouragement by the Service, through Force 2025).

The conclusion, then, is that air intelligence has remained at the first stage of the CMM since Marine aviation developed as a maneuver element three decades ago.

The establishment of an officer MOS, which might have professionalized this sub-community, was limited in its impact because it defined only one element of the community (officers), at only the most junior level and in a way that endured only for an officer's first assignment. This was not the intent of the Van Riper Plan, which envisioned that key billets within a community (such as MAG S-2s or billets within the MAW G-2/ACI) would be coded as requiring 0202s from the 0207-feeder pipeline. However, this element of the plan was not implemented and the manpower system fails to differentiate between intelligence officers at captain and above based on feeder MOS for nearly all billets. This retarded the development of any institutional knowledge within a set population by forcing the 'air intelligence' population to roll over almost entirely every three years.

The creation of the 0277 MOS provided needed credibility to 0207s but did so in a way that was not justified by any documented requirement for an additional skill (indeed, it was intended to supply the credibility needed by an already-established skill—0207—that NIOBC failed to provide) and was not done in a way that was required or justified by anything within the MOS manual, T/Os, the T&R manual, or any other authoritative document.

Furthermore, the solution to the problem was misapplied. If the intent was to raise the credibility of 0207s, the problem should have been addressed at the 0207-producing school. By applying this solution at an advanced school, the necessary change was both denied to NIOBC and led to confusion that 0277s were simply better-trained 0207s. And once the problem was addressed with the creation of AIOC, the 0277 course was kept from evolving by students who did not benefit from this training (i.e., 0231s and 0202s). This created an entire MOS and formal course curriculum that is misaligned or poorly sequenced.

There have also never been true instructors in air intelligence. Any informal instructors that may have existed locally were not subject to standardization because there was no mechanism by which to apply it (i.e., no fleet support inspections of training plans, no T&R events that require instruction, and no description of any instructor qualifications). The diffuse force structure of air intelligence contributes to this dynamic, but there have been no attempts to implement instructor roles or standardization efforts over MOJT training (in part because air intelligence MOJT training has not existed in the Intelligence T&R Manual since its first edition).

The establishment of the Ground T&R Program, instead of providing a concept for training (as the Aviation T&R Program Manual did for Marine aviation), provided a concept for training *infantry*-like units—a concept counterproductive to unit G/S-2 training. Instead of facilitating training, the Ground T&R Program neutered the ability of the Intelligence T&R Program to serve the needs of unit G/S-2s everywhere and removed the MOJT training the first Intelligence T&R Manual provided. Since 2006, air intelligence has lacked a T&R manual that is comprehensive or has objective standards. Its individual events have exclusively centered on entry-level training and it only briefly flirted with any collective training. These events have been few and vague enough that evaluation of their completion is almost purely subjective (e.g., with performance steps such as "Develop intelligence products in support of the six functions of Marine aviation").[476] The lack of documentation for SOPs, TTPs, or doctrine exacerbates this by providing no basis for establishing a standard of intelligence support to aviation (with T&R events only occasionally even citing references that would aid with assessing the enemy or understanding the aviation operations being supported). This provides no ability to support training for specific billets, supported units, or any continuing learning beyond the most basic elements necessary for entry-level training. All of this is further exacerbated by the general apathy towards T&R conferences and compounded by a myopic focus on entry-level formal course T&R events. Combined, this has led to constant revision of air intelligence events without

[476] Commandant of the Marine Corps, *NAVMC DIR 3500.101 Intelligence Training and Readiness Manual*, 7-11.

ever changing or expanding their focus or providing for MOJT, leaving the requirement for training anywhere else in a Marine's career blank.

The creation of AIOC made laudable progress in improving the baseline of entry-level training for air intelligence officers. But as a second order effect of the failure to evolve the 0277 MOS and WTI course, AIOC arguably created as many problems as it solved by calling into question the value of the 0277 MOS and making the Intelligence WTI course mostly redundant with AIOC, resulting in the only target population definable by MOS (0207) unable to gain much from the WTI course. The value of AIOC's creation is also somewhat diminished by the fact that its curriculum hardly changed at all in its first eight years. While a new course can be expected to have any number of shortfalls or errors at its beginning, the course materials for AIOC remained largely unchanged for almost a decade, with many glaring errors persisting and it continuing to teach peculiar frameworks neither found in Marine doctrine nor consistent with the doctrine of other Services.[477] This indicates a formal course unable to iteratively improve and a target population (i.e., of formally-trained 0207s) unable to identify such errors and recommend changes to the course team. This is strong evidence of air intelligence's inability to develop past the first stage of the CMM.

SITCC also represented the potential for some process improvement, with the highest Service echelons of both intelligence and aviation communities joining forces to develop a

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[477] As of 2015, this included obvious errors, such as teaching that AH-1s are capable of aerial refueling, or peculiar frameworks not grounded in any authoritative references, such as teaching the acronym DIAAID (Detect, Identify, Assess, Assign, Intercept, and Destroy) as the functions of an IADS. This is not only a unique framework not found anywhere else, but it mixes IADS functions and the IADS kill chain, making it not just non-standard, but incorrect. The *AFTTP 3-1.Threat Guide* establishes IADS *functions* as Detect, Control, and Engage and the *kill chain* as Indications & Warning, Detect, Identify, Track, Assign, Engage, and Assess. While this seems a small discrepancy, the persistence of DIAAID or the assertion that AH-1s are capable of aerial refueling indicates not just the absence of accuracy, but errors that should have been easily identified and corrected with any level of process improvement maturity. The AIOC course material has undergone almost continuous revision and correction since 2015.

solution. However, its success was cut short of its potential by failing to address the problem at its root cause, in this case entry-level training at MISEC. It can be argued that SITCC, ending up as an NMOS school (soon to be) open to more than just 0231s provided a superior solution than if efforts were initially focused on improving MISEC. However, the course SITCC took to get there was not an intentionally-directed process. It began as a course for MOJT and ended up as an entry-level course. It was only embraced and funded by a single MAW for the first seven years. It began with ad hoc courseware, requiring substantial effort to revise it to be consistent with the Service's SAT methodology. It initially required volunteers for both attendance and instruction (many of whom were as inexperienced—in some cases less experienced—than the students they were to instruct). And while SITCC ended up a qualified success, its success was more limited than initially envisioned (addressing only formal course training) and it arrived there only by accident and the sheer force of will of a few individuals.

The ACEINTSOP provided the Service with its first tactical air intelligence SOP; however, the reluctance to adopt it, unwillingness to disseminate it after adoption, and the continued apathy towards further formalizing or improving and expanding it demonstrates an organization not fully equipped to implement even such a small change.

MCRP 2-10A.9 also represented a step forward for Marine air intelligence, finally providing a doctrinal foundation off of which to base the entire enterprise. However, it too was subject to a general inability to affect change, reliant almost entirely on a single individual's efforts and apathy from the supporting establishment and OPFOR. (Another case where, with no air intelligence organization or element explicitly tasked to perform a function, incentives are not aligned to encourage process improvement or advancement of the Service.)

Air intelligence has also lacked any real center of excellence. AIOC's focus on entry-level training has made it a resource of limited value for advanced expertise or advanced community development. MAWTS-1's role as a center of excellence has been hampered by the necessity to continue instructing to a lowest common denominator of Marines who have not attended AIOC (e.g., 0231s and 0202s). The result of this is that, even after AIOC's creation, MAWTS-1 has been challenged to provide substantial instructional value beyond that which is provided by AIOC. Certainly, the differential between the 0277 curriculum and AIOC is marginal compared to that between the 7577 curricula and what is taught at the FRS. MAWTS-1 Intelligence Department's ability to serve as a center of excellence for air intelligence is further limited by the inapplicability of the WTTP to air intelligence and the lack of necessity to use 0277s as instructors (resulting in their use as anything but). This provides MAWTS-1 limited ability to implement or enforce any process improvements.

All of these failures are as much compounded as caused by the lack of a functional concept for intelligence support to Marine aviation. This prevents the articulation of requirements (anywhere within the DOTMLPF&C spectrum) necessary to support Marine aviation. With respect to training, this creates a situation whereby any intelligence section can reasonably argue it is sufficiently staffed and trained if it so desires, but also whereby those same intelligence sections cannot clearly articulate any personnel and training shortfalls (because of any inability to answer the question "shortfall from *what*?"). Even for ACIs, there is only an ability to identify personnel shortfalls in terms of rank and MOS, but not training. The lack of a CMMR (or concept on which the CMMR requirements would be based) makes it impossible to quantify the difference between an ACI staffed completely of Marines with the right rank and MOS but absolutely no air intelligence experience and an identically-staffed ACI that has undergone rigorous training tailored to air intelligence. This all makes it difficult to assess and justify the evolution of T/Os, which have remained largely static since at least the 1980's (with significant growth only in the ACI, thanks to Lieutenant Colonel Ingram's work).

These process failures are augmented by a number of obvious outcome failures that indicate a community generally incapable of process improvement. The most obvious of these include a completed but (quite literally) lost coordinating draft of FMFM 3-27, the institutional reticence to adopt or disseminate the ACEINTSOP, and the failure to provide substantive input to MCRP 2-10A.9, either in drafting or editing.

And just as the integration of process improvement efforts underpinned the success of Marine aviation training reforms over the years, the lack of integration continued to retard progress in air intelligence training. The end result is that most Marines spend their air intelligence tours without understanding their individual duties. And what limited time they have once they do understand those duties is generally only spent trying to improve their unit and not the broader enterprise. The difficulty in developing this experience under such force structure and manpower management conditions contributed to the low number of serious efforts to improve the community by addressing T&R shortfalls, entry-level training, the lack of documentation, or other institutional problems. General process improvement immaturity stifled even these efforts when they did take place.

This inability to generate a critical mass of expertise contributed to the almost complete lack of any professional body of knowledge (i.e., documentation, from doctrinal publication to TTP manuals to SOPs). This lack of a professional body of knowledge was itself a vicious cycle. It was sorely needed by a community that was perpetually staffed by air intelligence amateurs. Yet the community that lacked it often failed to generate the expertise required to write it. And when efforts were made to improve documentation, such documentation improvements were either misused or misunderstood by the community (or the Service) to the point that they were discarded (e.g., FMFM 3-27 or the collective T&R events in the fourth T&R manual) or such efforts were inappropriately applied so as to result in documentation that, while well-intentioned, was unusable (e.g., the 2d MAW T&R Manual).

In this way, the frame provided by the CMM brings a new understanding of the 'vicious cycle' identified by the RAND study.

It could be argued in the abstract that there are processes in place that allow air intelligence to optimize and that things are not all as bleak as this assessment makes them out to be. AIOC routinely seeks feedback from its graduates and their senior officers as to the effectiveness of the curriculum. There are periodic T&R conferences to review the necessary training and adjust it if there are identified shortfalls. Every unit submits After-Action Reviews (AAR) to MCCLL for exercises, PTP, and deployments in which they can identify lessons learned and recommend solutions—and these AARs are available to every other deploying unit to read and implement.

However, the history of the last thirty years makes it evident that these processes, as adequate as they may appear on paper, do not work. AIOC rarely receives any feedback from the OPFOR. T&R conferences regularly lack intelligence officer representation from the MAWs and regularly result in revisions that lack substance. And the intelligence portions of aviation unit AARs are habitually blank, address non-intelligence issues (e.g., security management), or repeat the same shortfalls as numerous other units from years before. These all serve as objective measures of an organization that is not maturing.

The lack of an air intelligence concept or defined requirements to support Marine aviation make it difficult to even measure the extent of this failure. Thankfully, such failure cannot readily be measured by combat losses, either. Nevertheless, air intelligence has had thirty years to evolve and it has continued to face the same problem of credibility stemming from inadequate training. After three decades, it remains stuck in the first stage of the CMM. From a process maturity standpoint, it must, then, be judged a failure.

7.C. Support of Hypothesis

This research hypothesized that: by understanding the successful history of Marine aviation training reform and the unsuccessful history of Marine air intelligence training reform, the Marine air intelligence community can identify and direct the specific training reforms necessary to complete planned air intelligence force modernization and to adopt mechanisms to ensure future attempts at training reform are more successful, closing the current training gap and mitigating strategic risks.

CMM analysis of the first case study demonstrates that Marine aviation is a learning organization with a high degree of process improvement maturity, able to successfully identify and implement process improvements and continually refine them over time. This analysis identified five primary elements that contributed to successful training reform in Marine aviation.

The first is a foundational mission and concept for how Marine aviation, generally, and Marine aviation training, specifically, supports the Marine Corps.

This mission and concept support and integrate the other four elements:

- a comprehensive and objective T&R manual that describes a persistent training continuum from entry-level through MOJT to a capstone qualification
- the creation of a center of excellence with the mission and authority to oversee management of the organization

- the training and standardization of instructors and the use of instructor trainers to manage unit training plans
- the articulation of CMMRs directly linked to readiness reporting requirements

CMM analysis of the second case study demonstrates that Marine air intelligence is not a learning community and has a low level of process improvement maturity, unable to successfully identify or implement process improvements, and lacking a significant ability to refine attempted improvements over time. CMM analysis also shows that the five major elements contributing to successful process improvement in Marine aviation are missing from Marine air intelligence.

This supports the hypothesis by identifying specific categories of process improvement mechanisms that can improve air intelligence training.

Additional validation of this analysis is provided by the *MCIS Plan of Action for FY2018*, which outlines four lines of operation for improvements to intelligence training (within and beyond formal courses):

- "Solidify the Foundation," focusing on articulating a concept of intelligence support and describing the roles and responsibilities (and therefore skills that need to be trained) of intelligence billets throughout the OPFOR.
- "Billet-based Training," which focuses on developing the training that supports the roles and responsibilities identified in the first line of operation.
- "Persistent Learning Environment," which focuses on establishing a continuum of training throughout a Marine's career (and into the OPFOR, through MOJT), moving the intelligence OccFld beyond the 'inoculation of training' idea created by the Ground T&R Program.
- "ISR Simulator," which focuses on presenting complex, realistic scenarios to intelligence Marines (rather than the scripted 'scenario intelligence' common today) as a way to teach and evaluate intelligence Marines.[478]

These lines of operation are consistent with the structures identified as contributing to progress along the CMM and, in fact, are exemplified by Marine aviation training.

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[478] Commanding Officer, Marine Corps Intelligence Schools, *Marine Corps Intelligence Schools Plan of Action for FY-18*, 1-2.

Complete, objective validation of these findings will only be possible after these process improvement mechanisms are implemented and results can be observed. Initial acceptance of this research's findings (with respect to T&R framework, enhancing MAWTS-1's authority as a center of excellence for air intelligence, and instructor framework) by I-Dept, MAWTS-1, TECOM, and the OPFOR also indicates a degree of validation.

CHAPTER 8

CONCLUSION

8.A. Summary of Conclusions

This research sought to answer the following question: how can the Marine Corps implement air intelligence training within the Force 2025 force structure such that it provides adequate intelligence support to Marine aviation in the future operating environment?

Subordinate research questions included: What factors have enabled training reform to succeed? What factors have contributed to failed reform within air intelligence? And what changes are necessary to realize efficient and effective air intelligence training reform?

Based on the analysis in Chapter 7, this research concludes that Marine air intelligence must replicate the five major contributing elements to Marine aviation's successful training reform:

- a functional concept that explains how air intelligence supports Marine aviation
- a comprehensive and objective T&R manual
- an authoritative center of excellence
- training and standardization of instructors and unit training program managers
- the articulation of CMMRs linked to readiness reporting requirements

The conclusions of this research fall into two categories: those directly replicating these five contributing elements and those not directly associated with these five elements but recommended based on analysis of the two case studies outside the CMM framework.

These recommendations are supported by further detailed discussion and analysis of limitations, considerations, and specific implementation recommendations in the appendices of this study. This chapter, coupled with these appendices, provide specific, actionable, and reasonably complete recommendations for how improved air intelligence training can be implemented within the Force 2025 force structure, including changes to the Intelligence T&R Manual and other actions necessary for implementing these changes, adapting them to mission needs as they are implemented, and establishing the elements of a learning organization that can sustain these changes and adapt and evolve into the future.

The conclusions from this research, while tailored to the Force 2025 force structure, retain validity outside of it and, with modification, can be implemented independent of Force 2025 reforms.

8.B. Capabilities Maturity Model Framework Recommendations

This research concludes that the following five major recommendations will mature the Marine air intelligence community along the CMM.

8.B.1. Reform Integration: The Need for a Concept

As identified in Chapter 3, before training improvements can be made, training requirements must be identified. Without a concept that establishes the capabilities required to support Marine aviation, it is possible only to identify these training requirements by proxy (as this research has done out of necessity).

Thus, the analysis in Chapter 7 implies a concept is absolutely essential for Marine air intelligence. This concept will provide a coherent and comprehensive vision for air intelligence that articulates central and supporting ideas and the support requirements necessary to support Marine aviation and the MCISRE. These requirements, in turn, will provide the foundation for the training reform this and other studies have *inductively* determined are necessary.

A concept will enable the integration of the other four major reforms described below across the air intelligence enterprise, describing how elements of the air intelligence community, across every echelon, support Marine aviation. This concept, in turn, will enable the *deductive* identification of training requirements for air intelligence Marines.

This study presents a relatively basic concept (detailed in Appendix C) whereby:

- squadrons are responsible for briefing/debriefing and COA/CONOPS development support (to include detailed support to mission planning) when the ACE operates as a squadron alone, with a squadron and MAG, or with squadrons and a MAW
- MAGs and MAWs provide doctrinal ACI functions (MAG S-2s as 'mini ACIs' at a reduced capacity and potentially reduced capability) when the ACE operates as squadrons with a MAG or squadrons with a MAW
- when the ACE operates with all three echelons present, the MAW provides doctrinal ACI functions, the MAG serves as a 'super squadron' (COA/CONOPS development support to include detailed support to mission planning), and squadrons provide only briefing/debriefing support.

A generally similar concept is provided by Colonel Michael Lindemann in a recent *Marine Corps Gazette* article.[479]

While this is incomplete as a concept, leaving out the specific capabilities necessary to support Marine aviation, using this baseline allows the articulation of specific reforms that address the four other elements identified in Chapter 7 (that are fundamentally dependent on a concept). This concept will need to be refined and codified in the future. Once it is written, the WISC CONEMP can be rewritten accordingly and nested underneath it as a supporting concept.

This concept will also have to wrestle with the bifurcation of air intelligence under the Force 2025 structure as well as the fact that air intelligence is a functional area fractured across multiple MOSs and multiple T&R manuals, complicating the Service's ability to address specific air intelligence training requirements. Identified below as an area for future research, this

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[479] Michael Lindemann, "Air Intelligence is a MAGTF Critical Enabler," *Marine Corps Gazette*, May 2019.

research cannot clearly conclude that the Ground T&R Program is at all adequate in its current form to support the training this study concludes is necessary.

8.B.1.A. Air Intelligence Bifurcation

Any air intelligence concept will have to bridge the bifurcation between WISC and non-WISC elements. With respect to the training capabilities described in the WISC CONEMP and the T&R framework this study recommends in Appendix D, this study recommends the unification of OPFOR air intelligence (between WISC and non-WISC elements) and their eventual absorption into the WISC. Because the establishment and early maturation of the WISCs will be disruptive, this study does not recommend doing this in the immediate future. Thus, the initial bifurcation of air intelligence serves to mitigate the risk associated with the WISC and this separation should therefore be temporarily maintained.

This is discussed in further detail in Appendix J.

8.B.1.B. Reconciliation of Training by Unit vice Occupational Field

An air intelligence concept will also have to reconcile the training and capability requirements of numerous OccFlds and MOSs that comprise air intelligence units. This is less of a challenge in Marine aviation because within the Aviation T&R Program, T&R manuals are aligned by TMS MOSs, just as units are. For example, the fifteen primary and secondary MOSs critical to VMM operations are all contained in a single MV-22B T&R Manual, despite belonging to OccFlds (e.g., 75) that include all TMSs. Such a construct is not possible within the current construct of the Ground T&R Program (with few exceptions, all MOSs in air intelligence are also found at non-ACE units). Because such reconciliation of MOSs for training is counter to the Ground T&R Program (another indicator of the Program's flaws with respect to support MOSs), and because this research was scoped within the existing Ground T&R Program, this study recommends adopting the CMMR concept, described in Appendix I and below, as a mechanism to link training from multiple MOS manuals (e.g., the SIGINT T&R Manual) to the Intelligence T&R Manual as well as a way to define air intelligence-specific training for multi-purpose MOSs (i.e., identifying what subset of 0202 training supports Marine aviation METs).

Appendix M includes further recommendations and detailed discussion of these issues.

8.B.2. Revisions to the Intelligence Training and Readiness Manual

This research recommends the Service substantially overhaul the Intelligence T&R Manual to provide for billet-based training that covers the full spectrum of air intelligence support to the ACE. The T&R framework recommended by this study includes three main components: qualifications, syllabi, and certifications. (Designations were omitted in the recommended framework due to the complexity they would add without providing clear additional value. If this framework is adopted, the addition of designations should be considered as the framework matures.) Appendix D describes this framework in detail.

Qualifications are assigned to personnel based on demonstration of proficiency in a specific skill. All qualifications are assigned one or more required T&R events. When all qualification requirements are completed and proficient, the individual may be granted the respective qualification by the commanding officer or as directed in the Intelligence T&R Manual. An individual's qualification status may be either 'Qualified' or 'Not Qualified.' At least one requirement/event for a qualification must have a proficiency period assigned. Under exceptional circumstances an event may be determined to be not required and a waiver is issued by the commanding officer (and documented in the Marine's training record).

Qualifications should be threat-focused (described in Appendix E), based on operational support requirements such as supported unit METs or the roles and responsibilities of the ACI (described in Appendix F), and instructor qualifications (described in Appendix G). Operational support qualifications should primarily be derived from the supported unit METs or, in the case of the ACI, the roles and responsibilities of the ACI as articulated in the *MCRP 3-20F.2 Marine Tactical Air Command Center Handbook* (these supported unit METs are described in greater detail in Appendix A and Appendix B).

Syllabi are all events for a unique billet in an S-2 (supporting a specific unit's METL) or in an ACI element (supporting that element's roles and responsibilities). Syllabi are those threat, operational support, and instructor qualifications necessary for a specific billet. Syllabi require the development of a CMMR, discussed in greater detail below.

A Certification refers to the formal endorsement of a collective unit having attained the specialized skills required to support a designated unit as demonstrated by a certification exercise that requires the demonstration of all skills required to support a designated unit. The evaluation process is conducted in accordance with the Certification event(s) by a designated instructor or authorized personnel (determined by unit commander). Certifications may require a proficiency period. Certifications are described in more detail in Appendix H.

A critical element of T&R manual revisions necessary to provide accountability for the execution of this T&R framework is the linkage of T&R completion with a unit's training readiness metrics in DRRS. As discussed in Appendix A, it is not clear that this is possible under the current construct or outside of the WISC.

8.B.2.A. Accountability through the Defense Readiness Reporting System

There are only two mechanisms to ensure compliance of training required in the T&R manual: readiness inspections and DRRS reporting. (Within the Aviation T&R Program and under the WTTP, MAWTS-1 fleet inspections serve as an additional accountability mechanism, although their principal enforcement mechanism is the threat of qualification revocation—an act that would have negative impact to unit readiness as reported in DRRS.)

Because reportable units in DRRS are those elements with Unit Identification Codes (UIC—i.e., whole units vice staff sections within them) and because METs are external outputs (i.e., operations conducted by the unit, not internal staff support, such as by unit G/S-2s), the only units that will ever have to ensure that intelligence training is conducted (for reporting in DRRS) are intelligence units, such as Intelligence and Radio Battalions (and WISCs, with their activation).[480] This makes the T&R manual effectively *optional* for most unit commanders. Thus, for air intelligence, where current force structure is diffused, comprised only of unit G/S-2s, the T&R manual is not institutionally relevant (i.e., in a mandated or accountable fashion).

Readiness inspections are conducted under the authority of *MCO 5430.1A Marine Corps Inspector General Program* and inspect a unit's readiness by functional area.[481] No functional area currently covers intelligence training (or intelligence in any other capacity). Functional Area (FA) 250 is a legacy functional area that covered intelligence and there is current discussion about re-instating it, but no intelligence functional area is currently inspected. Regardless, readiness inspections normally only take place every two years.[482] And while commanders are required to have ongoing internal inspections of such programs, it is well documented that, in practice, many units ignore this internal inspection requirement. This results in functional areas falling outside of standards not long after a formal inspection is completed and, in the months preceding the next inspection, a concerted effort by a unit to get functional areas back within standards. Thus, even with the re-instatement of FA 250, it can not necessarily be expected that

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[480] Chief of Naval Operations et al., 4-A-1.
[481] Commandant of the Marine Corps. *MCO 5430.1A Marine Corps Inspector General Program* (Washington, D.C.: Headquarters, United States Marine Corps, August 1, 2018), 4.
[482] Ibid., 7.

air intelligence elements, even WISCs, will maintain training standards year-round based on readiness inspections alone.

Additionally, the functional areas are applied broadly across all units that manage such programs (in this case, FA 250 would apply to any intelligence units or units with an intelligence section, representing most of the OPFOR). It is unclear how tailored and specific the FA 250 inspection could be to mandate the tailored training recommended by this research. (One method would be to have it inspect whether T&R standards by billet are being met, but this would necessitate a detailed CMMR, as described in Appendix I.)

In contrast, DRRS reporting is done monthly. This places a great deal of stress on unit commanders across the Service to ensure unit training readiness does not drop below an acceptable threshold. In Marine aviation, where readiness is strictly defined in the Aviation T&R Program and its T&R manuals, the result is that the entire squadron maintains a high degree of focus on training every day, for the duration of the daily flight schedule. In no other area of the Marine Corps is the daily life of an operational unit so rigidly dictated by such a (T&R-based) schedule, all because of this necessity to train and maintain readiness for DRRS reporting.

Reliance on DRRS, then, offers the best guarantee that training is completed. But as the METs evaluated by DRRS cannot include internal staff processes (e.g., intelligence), DRRS inspection of intelligence training can only be done for intelligence units and not unit G/S-2s. This is one of the strongest training-based arguments for the creation of the WISC. Without the WISC, this accountability will only be achieved through FA 250 and with a detailed CMMR (and even then, only biennially). After WISC activation, this accountability can be expanded to non-WISC intelligence sections only through FA 250 (with a detailed CMMR) or by moving these billets into the WISC and providing semi-permanent detachments to those units (which will bring those Marines under the more complete accountability mechanism of DRRS while maintaining the same level of intelligence support promised by organic sections—this is discussed further in Appendix J).

8.B.3. Center of Excellence

MAWTS-1 already serves as a center of excellence for Marine aviation. While many assume it serves in the same capacity for air intelligence, a number of changes are required to enable it to do so. To this end, this study recommends the expansion of the WTTP and the adjustment of the MOS and T&R manuals to enforce use of the 0277 MOS as instructor, instructor trainer, and a training program manager.

The WTTP should be updated to expand its authority (and by extension, MAWTS-1's authority) over air intelligence. This should be specifically-scoped to air intelligence training as defined by CMMR training events to limit the encroachment of the WTTP into the Ground T&R Program. Because CMMRs are explicitly tied to billets within the MAW, this provides a very specific and limited expansion of the WTTP into the Ground T&R Program that is restricted to training within Marine aviation units. This is described in detail in Appendix K.

To enable MAWTS-1 to exercise the authority over the OPFOR provided by an expanded WTTP, the 0277 MOS should be used primarily as an instructor, instructor trainer, and training program manager. This is described in detail in Appendix L and augments the instructor qualification element of the T&R framework described in Appendix G.

These reforms would establish a habitual and mutual relationship among AIOC, SITCC, OPFOR intelligence sections, supported aviation units, and MAWTS-1. Expansion of the WTTP would also make explicit, through a program aviation units are already familiar with, the intelligence training responsibilities of commanders, facilitating compliance with T&R training requirements even outside the WISC construct.

8.B.4. Instructors

Implementing specifically-qualified instructors can be accomplished by the instructor qualifications in the T&R framework (described in Appendix G). By requiring 0277s to train instructors, requiring qualified instructors to instruct and evaluate events, and by expanding MAWTS-1's authority to ensure the T&R is executed to standards (Appendix K), MAWTS-1 will be able to establish standards for these instructors and periodically inspect the quality of both OPFOR 0277s and the instructors they train during periodic fleet support visits.

This study recommends an instructor framework whereby 0277 are used primarily as instructors, instructor trainers, and training program managers, formalizing MAWTS-1's adjusted approach to the Intelligence WTI course (developing 0277s who are threat SMEs, advanced mission planners, senior instructors, and expert communicators—described further in Appendix L). In conjunction with expanded and improved MOJT T&R events, this will enable MAWTS-1 to push the elements of current Intelligence WTI curriculum that do not directly support these four characteristics down to unit training programs, finally freeing MAWTS-1's Intelligence WTI program up to teach advanced material. This will advance the capabilities of 0277s while also advancing the capabilities of 'fleet-average' 0207s and 0271s. This instructor framework would augment 0277s (as instructor trainers) with subordinate instructors who are qualified in basic instruction techniques that, when paired with a currency in a threat or operational support qualification, allow them to instruct and evaluate the same qualification (Appendix G).

8.B.5. Core Model Minimum Requirements

Identifying specific billet knowledge and skill requirements that will inform the T&R framework and identifying the specific training required for those billets (i.e., their syllabi) necessitates the development of a CMMR. Furthermore, a CMMR is critical for defining readiness training requirements for all ACE intelligence units and sections (especially the WISC, whose CMMR generation requirements should factor directly into DRRS).

This study recommends that air intelligence develop detailed CMMRs for all standard ACE elements (i.e., squadrons by TMS, MEU ACEs, fixed- and rotary-wing MAGs, MEB ACEs, and MAWs). This study is not able to recommend specific CMMRs for all of these echelons, however it is able to make tentative recommendations for some and highlight issues for consideration when developing this detailed CMMR. This is detailed in Appendix I.

When CMMRs generated by the WISC are developed, this should result in those billets being mapped back into supported units' T/Os. This is discussed in detail in Appendix N.

This should also result in a Table of Organization and Equipment Change Request (TOECR) that adjusts the WISCs' organizational structure. This study recommends that this TOECR abandon the concept of 'rotary-wing platoons' and 'fixed-wing platoons' and adopt a structure that identifies elements of WISC employment (i.e., DSTs). While WISC commanders are still free to organize their units by these platoon concepts, the TOECR makes clear the force generation capacity of the WISCs. This is discussed in detail in Appendix I.

8.C. Other Recommendations

This study makes two additional recommendations, outside the scope of CMM-guided process improvements.

8.C.1. Maintaining 'Air Intelligence Preparation of the Battlespace'

With Army roots, the IPB publication has remained firmly focused on ground combat. The consequences of this are twofold.

First, it fails to provide adequate tools for air intelligence Marines to fully implement IPB as a process. The elements are all present, but with a ground-centric publication, the Service requires both air intelligence instructors and students alike to use their imaginations to translate ground combat examples into relevant aviation operations examples. When the students (in formal entry-level schools) do not yet have any operational context within which to place what they are learning, this is a serious obstacle.

Second, it reflects a culture that implies the most important intelligence effort is focused on ground combat to which aviation operations must be supporting and subordinate. This is a legacy of a pre-1980s, pre-maneuver warfare mentality, when the GCE drove MAGTF operations and the ACE was simply a combat support arm (and is reinforced by the U.S. Army's lack of doctrinal differentiation between aviation and ground units).

The necessity of maintaining a connection to Army doctrine (and thus a shared publication) has long been assumed by the Marine Corps. However, the recent (but still tentative) decision of United States Army Training and Doctrine Command (TRADOC) to pursue an independent Army Land Operations-centric IPB publication (stripping out Marine Corps-specific elements) provides an opportunity to establish a Marine Corps IPB doctrinal publication that is more balanced across domains and more reflective of MAGTF intelligence needs (embracing rather than neglecting the concept of the MAGTF, which differentiates the Marine Corps as a Service, in our intelligence doctrine).[483] When this occurs, the IPB supplement in MCRP 2-

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[483] Headquarters, United States Marine Corps, Intelligence Department, *20190109 ESAG VTC Slides* (Washington, D.C.: Headquarters, United States Marine Corps, Intelligence Department, January 9, 2019), 22.

10A.9 should be updated, expanded, and merged into a Marine Corps publication that finally achieves the Service modifications first deemed necessary thirty years ago.

8.C.2. A Marine Air Intelligence Plan

Arguably one of the most important lessons from the evolution of Marine aviation T&R is that it takes time it takes for an organization to ‘get where it is going.’ If early on in Marine aviation training reform, a comprehensive study had been done to recommend a solution, the solution would not look the way Marine aviation does today.

For decades, the answer to improving the SWDU and SWTU was to expand its mission to include conventional weapons but keep it voluntary and fixed-wing (i.e., the MAWTU). Calls for a center of excellence, if answered immediately, would have vested HQMC DivAv staff with sponsorship and maintenance of the T&R, and not a unit (i.e., MAWTS-1) that regularly trained the most qualified aviators and conducted large exercises twice a year to validate any changes or developmental techniques. Expansion to encompass rotary-wing platforms with MAWTS-1 and the institutionalization of this advanced instruction (i.e., WTTP and 7577 WTI MOS) was strongly opposed and only brought about by deception. Even then, MAWTS-1 took years to expand its WTI course to cover enlisted aircrew MOSs. Thus, it would be naïve to imagine that even the most comprehensive study of air intelligence T&R improvement would happen upon the answer, fully-formed.

This study therefore recommends the development and maintenance of a long-term plan or strategy for air intelligence training. Where responsibility this would reside is outside the scope of this study. However, a few options are apparent. With the expansion of the WTTP, it may be appropriate to include such a plan or strategy with HQMC AVN’s Marine Aviation Plan (with I-Dept and/or MAWTS-1 Intelligence Department responsible for composing this element of the plan)—this would achieve an impressive degree of operational/intelligence integration at the Service level. It may be part of an addendum to a Service concept for air intelligence. Or this comprehensive plan might be appended to the existing MCISRE Supporting Strategy for Aviation Intelligence.

8.D. Areas for Future Research

The scope of this research, to include the time available and my expertise, precluded the inclusion or the adequate treatment of certain issues, it made assumptions about other issues that deserve further investigation, and it identified issues related to the topic but unrelated to the research question. Described below, these all present areas for future research.

Additionally, the conclusions of this research inherently cannot be conclusively or objectively validated without implementation and at least a few years of observation. Thus, the periodic re-validation of any of this study's findings that are implemented is itself an area for future research.

8.D.1. Include the Marine Air Control Group

Consistent with Service doctrine, this study defined air intelligence as "the combination of all-source intelligence, training, personnel, and techniques that assesses the weather, adversary, and terrain impacts to the air domain."[484] This focused on assessment of enemy air and air defense capabilities, support to flying units, and the weather and terrain impacts to both. This focus generally omitted intelligence support to MACG units. These units generally fall into two categories: ground-like units that support Marine aviation and units that support the C2 of Marine aviation (e.g., agencies of the MACCS).

[484] Headquarters, United States Marine Corps, *MCRP 2-10A.9 Air Intelligence*, 1.

The first category of unit must still be supported by air intelligence T&R events, even if only by articulating the appropriate ‘ground’ intelligence T&R events (e.g., an aviation logistics unit requiring convoy support) in a CMMR for those units.

The second category of unit is partially addressed by the ACI (which supports the TACC, the senior agency within the MACCS), however the subordinate MACCS agencies (i.e., DASC and TAOC) require intelligence support as well.

Neither is explicitly addressed in this research. But if air intelligence is the habitually-neglected sub-discipline within Marine intelligence, MACG support is the habitually-neglected sub-discipline within air intelligence. It deserves further study.

This research tentatively recommends that such MACG support be explicitly included in an air intelligence concept and, through its inclusion, be translated into an MACG-inclusive CMMR. This, in turn, requires an expansion of the air intelligence T&R framework to cover MACG support.

8.D.2. Assess the Adequacy of the Ground Training and Readiness Program for Support Specialties

The scope of this research was limited within the current Ground T&R Program, assuming that it would be maintained and ensuring recommendations were consistent with it. However, this research has highlighted a number of ways in which the Ground T&R Program is seriously flawed with respect to support MOSs in unit G/S-2s. This will be somewhat mitigated with the creation of the WISC; however, the seriousness of these flaws warrants future research that addresses whether the Ground T&R Program, with its focus on DRRS reporting, is adequate for support MOSs outside specialized units. If not, can it be made to be? Or does the Marine Corps require an entirely different T&R program for support MOSs at units where their T&R

progression will not factor into DRRS reporting? Alternatively, does the Service (or DOD) need to investigate alternative readiness reporting methods?

8.D.3. Drop the Idea of Flight School for Air Intelligence Marines

While not an issue explicitly raised by this research, this idea merits mention here.

Since the Van Riper Plan, much has been made about developing competent intelligence Marines and the 'crisis of confidence' the Service has had towards some in their intelligence ranks (and arguably still has with respect to air intelligence). As a result, it is not uncommon for intelligence reformers to occasionally make an analogy between 0207s and 0203s, drawing attention to 0203's attendance of IOC (the course that produces 0302 Infantry Officers and currently a prerequisite for the course that produces 0203s). This training pipeline produces 0203s that are fully-qualified 0302s (infantry officers), having gone through exactly the same formal training as the 0302s they support. Those who make this analogy tend to conclude that sending 0207s though flight school (or at least parts of it) would solve 0207s' credibility problem by providing analogous training. While there may be merits to such a suggestion, this conclusion is based on a significant fallacy: flight school is to 0207s as IOC is to 0203s. This is not the case.

Infantry officers learn the *tactical employment* of their weapon system (i.e., an infantry platoon and company) at IOC. Aviators learn the *bare mechanics* of flight at flight school. It is only when aviators arrive at FRSs that they learn the *bare mechanics* of flying their particular aircraft.[485] And it is not until they have arrived at their operational squadron that they begin to learn the *tactical employment* of their aircraft. Furthermore, it takes many years of progression in

[485] Single-seat TMSs learn some degree more than the *bare* mechanics, having to produce fully-qualified aircraft commanders from the FRS. This necessitates they have a limited proficiency in the tactical employment of their weapon system but in many cases, they are not even qualified to be solely responsible for carrying or delivering ordnance. FRSs for TMSs with at least two pilots produce co-pilots with no tactical proficiency to speak of, waiting until their aircraft commander qualification before their squadrons train them in tactics.

their T&R program before an aviator gains tactical proficiency in the multi-aircraft formations that their squadron is tasked to employ (i.e., sections, divisions, and flights). These are the same formations that air intelligence Marines must be capable of supporting on the day they report to their squadron.

Thus, the analogy between IOC and flight school breaks down when considering that learning the *tactical employment* of the supported weapon system (i.e., platoons and companies) is what makes IOC a beneficial component of 0203 training.

The more appropriate infantry analogy to flight school would be Officer Candidates School, where a candidate learns the bare mechanics of infantry life, such as how to pack a ruck, how to use hand and arm signals, and how to safely handle and maintain accountability of a rifle. Even the basic infantry tactics learned in The Basic School are too advanced for an accurate infantry-to-flight school analogy.

And that is all without considering the prohibitive financial cost (basic flight training costs approximately $1,500,000 per aviator), personnel screening (aviators must be physically and medically screened beyond the standards of intelligence personnel), and time investment (up to two years) to get an aviator through basic flight training, let alone the cost to gain tactical proficiency (an additional $12,000,000 and up to four more years per aviator).[486] The shared experience of flight school may indeed generate comradery, but comradery is not confidence or competence.

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[486] United States General Accounting Office, *Military Personnel - Actions Needed to Better Define Pilot Requirements and Promote Retention (GAO/NSIAD-99-211 Military Personnel)* (Washington, D.C.: United States General Accounting Office, 1999), 18; Commandant of the Marine Corps, *NAVMC 3500.11E MV-22B Training and Readiness Manual* (Washington, D.C.: Headquarters, United States Marine Corps, April 16, 2018), Enclosure (1), 2-3. Dollar amounts given are adjusted for inflation to 2018 dollars, the last year for which Consumer Price Index numbers are available. The original 1999 figures were $1,000,000 and $8,000,000, respectively.

In addition to this false assumption, every such argument (in favor of giving 0207s flight school experience) encountered in archival research fails to consider a key fact: Marines with flight school experience *are* regularly designated as 0207s.

When Marines fail to complete flight school (or TMS-specific entry-level training), voluntarily give up their wings, or are medically disqualified from flying, it is not uncommon for them be sent to AIOC and re-designated as 0207s. In my anecdotal experience, these intelligence officers have the same quality distribution as Marines without flight experience. Anecdotal experience aside, if flight school experience led to a measurable increase in competency, operational mindset, and perceptions of credibility, this fact would be expected to feature prominently in such arguments. That it does not suggests there is not a strong correlation between performance as an air intelligence officer and flight school experience.

This research has concluded, explicitly, that increasing an air intelligence Marine's understanding of the tactical employment of the supported weapon system (through MET-derived training) will improve their capability (and thus gain the supported community's confidence). Thus, this research *implicitly* concludes that flight school attendance will not contribute to the operational competence of an air intelligence Marine because it would provide no operational context for understanding the tactical employment of the supported weapon system.

If any future research addresses this issue, this study recommends that such an investigation start with an evaluation of 0207s with flight school experience in comparison to their earthbound peers to determine if there is any correlation between the two.

8.D.4. Necessary Military Occupational Specialties for Qualifications

MOSs are used to define the individual skills required by the Service in specific billets on T/Os. Headquarters, United States Marine Corps, Manpower and Reserve Affairs (M&RA) uses MOSs to "develop and maintain a personnel inventory of skilled Marines for assignment to meet the organizational requirements of [units]."[487] Therefore, future changes to the T&R manual should consider linking air intelligence qualifications (which are fundamentally skills necessary for organizational requirements) to MOSs.

Across the classification of MOSs available, the NMOS appears most appropriate. This would facilitate the tracking of WISC readiness through required individual training skills. The MOS Manual prescribes, however, "MOSs will not be created without corresponding requirements in tables of organization."[488] This would require air intelligence T/Os to be revised to reclassify specific billets as requiring certain qualifications (this, in turn, necessitates the definition of requirements that can be achieved by developing a CMMR).

This approach would facilitate the tracking of individual skills as Marines progress and is analogous to the recent changes tracking key aviator designations (e.g., section lead, division lead, flight lead) as NMOSs available to any aviator PMOS.[489]

However, classifying billets in the T/O by qualification requirements may limit the flexibility of a WISC or its MAW to adjust the qualification requirements levied on the WISC's force generation process. Thus, as a Training and Exercise Employment Plan (TEEP) is adjusted, the T/O would remain static. Without adjustment of DRRS requirements to reflect the TEEP, this

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[487] Commandant of the Marine Corps, *NAVMC 1200.1D Military Occupational Specialty* Manual, Enclosure (1), vii.

[488] Ibid., Enclosure (1), viii.

[489] Ibid., Enclosure (1), 1-129 – 1-131.

would place two burdens on a WISC: to meet the force generation requirements of both the T/O and the TEEP (which are not likely to be identical).

Future research may determine that NMOSs are not necessary or not ideal, however it is clear that some mechanism for skill tracking is necessary. This may be as simple as tracking a Marine's qualifications in MCTIMS or the use of 'Intelligence Performance Records' (analogs to 'Aircrew Performance Records').

8.D.5. U.S. Air Force, U.S. Army and U.S. Navy Air Intelligence Training

As stated in Chapter 4, a third case study, investigating the USAF's approach to intelligence training, was initially considered and researched. However, the differences in Service structure and frameworks would have required significant interpretation of a USAF case study would be required to develop conclusions and recommendations for the Marine Corps' unique approach to training and skill tracking. As an already well-studied area and because of these differences, this study can suggest no major changes to USAF air intelligence training.

Archival research did, however, identify that U.S. Army air intelligence exhibits the following similarities to parts of Marine air intelligence's history: there is no formal air intelligence school; there is no differentiation of enlisted all-source intelligence soldiers with aviation experience; aviation brigade and battalion intelligence officer billets are coded for 15C35s (aviators who have also attended the Military Intelligence Officer Tactician Course and the Military Intelligence Captain Career Course) rather than career intelligence officers; and S-2 T/Os are too small to support the scope of the aviation unit's mission.[490] U.S. Army air intelligence leaders have even explored the Marine Corps' SITCC as a model for a solution,

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[490] Corby Koehler, *Fixing Aviation Intel*, Armed Forces Journal. June 1, 2013. http://armedforcesjournal.com/fixing-aviation-intel/

sending a number of students through the course.[491] Based on these similarities, U.S. Army efforts to leverage Marine Corps air intelligence solutions, and the comparable size of U.S. Army aviation to Marine aviation, it is likely that research similar to this study, conducted for the purposes of improving U.S. Army air intelligence, would provide valuable and actionable conclusions.

This research encountered no documentation regarding USN air intelligence training or attempts to improve it. This may be because USN air intelligence training is sufficiently adequate as to not merit study or mention, or because it is such a marginal or neglected a field in USN intelligence as to not receive study or mention. Thus, research similar to this study, conducted for the purposes of improving USN air intelligence, may be warranted.

The lack of any joint or multi-Service approach to air intelligence also indicates the need for research studying the similarities and differences in Service air intelligence training to determine the value of joint solutions or cross-pollination of techniques or approaches between Services.

8.D.6. Relative Importance of Air Intelligence across the Range of Military Operations

This research was conducted under the assumption that the future operating environment in which Marine aviation will have to operate will be the near-peer A2AD threat described in national strategies and the MOC. This research did not explore the relative importance of air intelligence to effective aviation operations across other elements of the ROMO. It is possible that the nature or importance of air intelligence in low-intensity conflict is measurably different than in the future operating environment described by current strategic documents.

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[491] U.S. Army Special Operations Aviation Command (Airborne) G-2, "RE: (U) Touching Base (Post Air STAC),"email, December 2, 2016.

Indeed, this research has concluded that the nature of the wars fought since the ACE developed as a maneuver element permitted or even fostered the neglect of air intelligence with relatively little consequence to aviation operations. This may suggest that air intelligence is comparatively less important in such conflicts. As a consequence, this research *implies* just such a hypothesis (that the nature or importance of air intelligence varies across the ROMO). The conclusions of future research in this area may help the Services more effectively allocate intelligence resources in future conflicts or provide more tailored intelligence elements depending on the nature of the conflict.

8.D.7. Applicability of Research to other Marine Intelligence Fields and Related Occupational Fields

The research methodology applied by this study is not specific to Marine aviation or air intelligence. It therefore has merit in its application to other intelligence sub-disciplines (e.g., ground intelligence). Marine aviation was a natural benchmark against which to measure air intelligence; however, it is considered by many observers as one of the most functional and professional communities in the Marine Corps. The adoption of the T&R concept from Marine aviation and the effort to develop a ground version of M-SHARP (which evolved into MCTIMS) are evidence of this. This suggests that the first case study and this study's research methodology also have applicability outside Marine intelligence.

Current discussions among the newly-created MIGs, especially about the reconciliation of multiple information warfare-related OccFlds (of which the intelligence OccFld is one), identifying training requirements, and even the concept of making Marine Corps Information Operations Command the "MAWTS-1 of Information Operations," all suggest this research may be applicable to analogous issues being face by the Service with the activation and maturation of the MIGs.

8.D.8. Service Intelligence Personnel as Members of the Intelligence Community

During the formation of this research topic, numerous National Intelligence University staff questioned the applicability of the topic on the grounds that it addressed the Service's OPFOR military intelligence elements and not 'the IC.' This was mirrored by numerous Marine Corps personnel, both at I-Dept and within the OPFOR, who were unable to say for certain whether OPFOR intelligence Marines were members of the IC or who insisted that they were not. This suggests a false conception of the Service components of the IC that is restricted to Service headquarters intelligence staff (e.g., I-Dept) and Service Intelligence Centers (e.g., MCIA) but that does not extend to Service intelligence personnel in the operational forces.

This is not the case (and the Marine Corps Intelligence Oversight orders makes this explicit).[492]

This inaccurate conception of the IC has potential legal consequences as many operational Service intelligence personnel may erroneously believe that policies, laws, directives, or other authoritative documents aimed at the IC do not apply to them and need only be followed as best practices, if at all.

This is an inadequately understood area and deserves further research and education at all echelons.

[492] Commandant of the Marine Corps, *MCO 3800.2B Oversight of Intelligence Activities* (Washington, D.C.: Headquarters, Untied States Marine Corps, April 30, 2004), 3.

APPENDIX A

MISSION ESSENTIAL TASK LIST DEVELOPMENT

Understanding METLs, what they are (and are not), and how they are developed is essential to understanding why the Ground T&R Program (focused on DRRS readiness reporting on a unit's ability to fulfill its METL) has been inadequate for air intelligence to date. Critical to developing conclusions for this research, this understanding also informs how air intelligence can derive T&R events from supported units METs.

Title 10 requires CJCS to "[evaluate] the overall preparedness of the joint force to perform the responsibilities of that force under national defense strategies and to respond to significant contingencies worldwide" and to "[establish] and [maintain] … a uniform system of evaluating the preparedness of each such command … to carry out missions assigned to the command or commands."[493] The Joint Combat Capability Assessment fulfills these statutory requirements.[494]

One element of the Joint Combat Capability Assessment, the Chairman's Readiness System, "establishes a common framework for assessing unit and joint readiness against approved strategic planning documents."[495] The Chairman's Readiness System has two elements, unit reporting and strategic assessment. Unit reporting is conducted through DRRS, which serves to provide an assessment of a unit's ability to conduct its mission, as measured against its METL.

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[493] National Defense Authorization Act for Fiscal Year 2017, Public Law 114-328, § 603, *U.S. Statutes at Large* 130 (2016): 2352, codified at *U.S. Code* 10 (2018), § 153.

[494] Chairman of the Joint Chiefs of Staff, *CJCSI 3401.01E Joint Combat Capability Assessment* (Washington, D.C.: Joint Chiefs of Staff, May 19, 2014), 2.

[495] Ibid., Enclosure (A), A-1.

A unit METL is developed by combining the METs required of a unit in designated named operations, designated major operations, and the core tasks of all units of the same type (depicted in Figure 21).

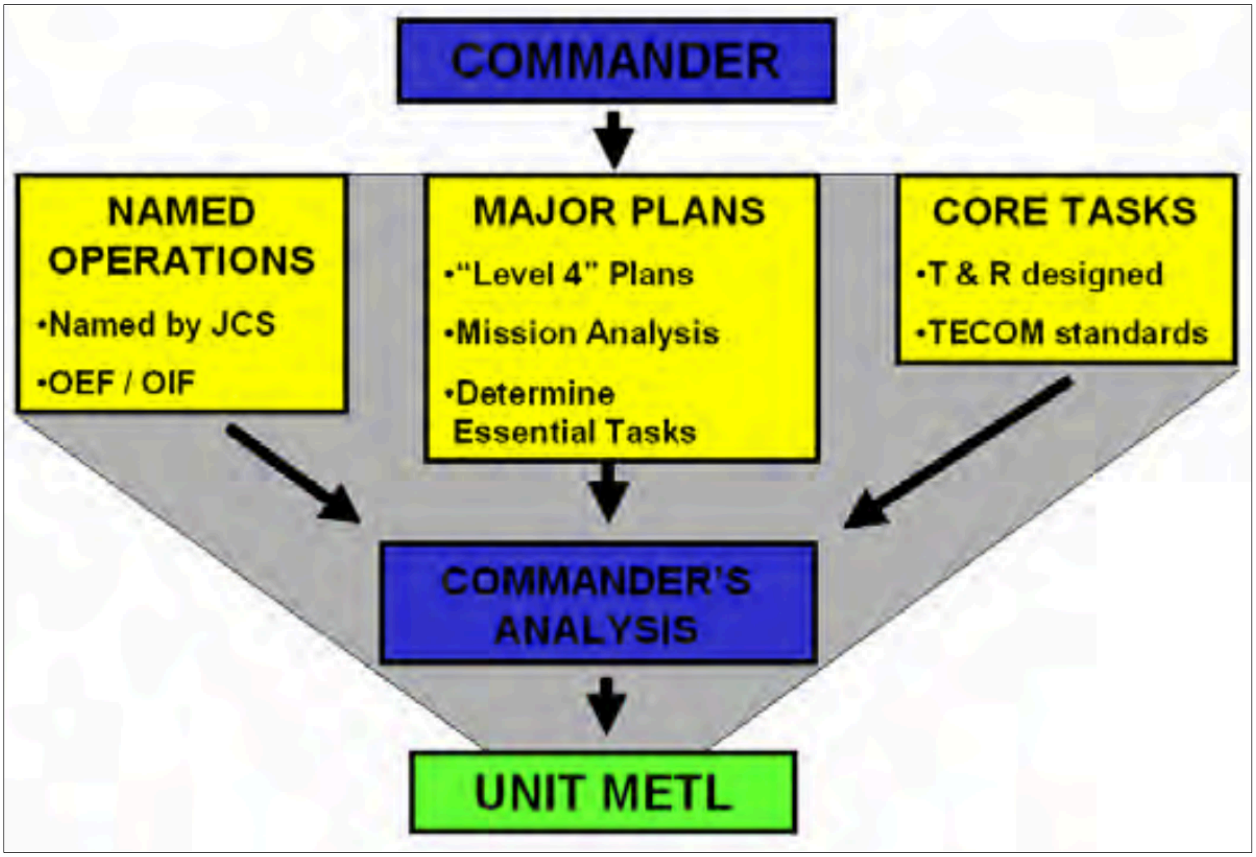

Figure 21. Unit METL Development. Chief of Naval Operations et al., MCO 3500.26A Universal Naval Task List, 4-A-1.

The assessment of readiness against the METs in a unit METL is

> essentially a binary assessment: Can the unit accomplish the MET to standard? The decision as to whether the assessment is "Yes" or "Qualified Yes" will be driven by whether the unit has actually observed/demonstrated the capability. … T&R standards should support this observation process.[496]

METs are derived from the Universal Joint Task List (UJTL) Program, which "[maintains] the authoritative menu (or library) of all approved joint tasks written in a common language. The UJTL facilitates the translation of the National Defense Strategy, National

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[496] Chief of Naval Operations et al., 4-A-1.

Military Strategy, and other policy and direction into actionable joint tasks commonly understood across the Department of Defense."[497]

> A UJT [Universal Joint Task] is an action or activity assigned to an individual or organization to provide a capability or resource. They are based on extant and potential joint capabilities, and have a foundation in approved joint doctrine or validated joint concepts. Specifically, UJTs describe "what" joint organizations must do using common and joint terminology. However, UJTs do not address "why," "when," "where," or "how" a task is performed, nor "by whom" or what organization performs the task. Thus, UJTs are "universal"—adaptable and adjustable to describe mission requirements of any joint organization through the application of tailored conditions and standards in the mission-essential task list (METL).[498]

The Navy, Marine Corps, and Coast Guard maintain a common Universal Naval Task List (UNTL—published as *MCO 3500.26A Universal Naval Task List* for the Marine Corps). The UNTL "As applied to joint training and readiness reporting … provides a common language that commanders can use to document their command warfighting requirements as mission essential tasks."[499] The UNTL

> contains a comprehensive hierarchical listing of the tasks that can be performed by a naval force, describes the variables in the environment that can affect the performance of a given task, and provides measures of performance that can be applied by a commander to set a standard of expected performance.[500]

METs are "externally focused [tasks] critical to mission accomplishment."[501] They are categorized as Core or Core Plus. A Core MET is "A task that all units of the same type are organized, trained, and equipped to perform."[502] A Core Plus MET is

> A task that may be required of a unit, but not all units of the same type, in addition to its core METs. Core plus METs reflect additional capabilities that may be required to

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[497] Chairman of the Joint Chiefs of Staff, *CJCSI 3500.02B Universal Joint Task List Program* (Washington, D.C.: Joint Chiefs of Staff, January 15, 2014), A-1.
[498] Ibid.
[499] Chief of Naval Operations et al., 2.
[500] Ibid., Enclosure (1), 1-1.
[501] Commandant of the Marine Corps, *MCO 3502.6A Marine Corps Force Generation Process*, 2.
[502] Ibid.

support a specific CCDR or a mission that is limited in duration or scope; additional resources (personnel, equipment, or training) may be required to perform a core plus MET.[503]

A MET may be quantified or unquantified. A quantified MET associates conditions ("variables of the environment that affect the performance of tasks in the context of the assigned mission") and standards (that "quantify the outputs of the activity, together with the resources and training required to produce those outputs under the task's conditions") to the essential task.[504] An unquantified MET consists of just the essential task.

Essential tasks have three characteristics: standard terminology (as provided by the UJTL), essentiality, and external focus. The essentiality of a task indicates that it is "absolutely necessary, indispensable, and critical," those tasks "for which the unit was designed, organized, or sourced to the operation or OPLAN. They answer the question, 'Why does this unit exist?'"[505] The externally-focused characteristic requires METs "be focused outside of the command and support another command or directly affect the enemy" and "exclude common internally focused activities such as organic logistics support or command and control of internal organizations."[506] Both of these characteristics (externally-focused and essentiality) *exclude* the possibility that a unit G/S-2's capability (i.e., as measured by T&R) can be evaluated against a METL (intelligence units, whose external outputs involve intelligence activities, can have intelligence-related METs).

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503 Ibid.

504 Ibid., A-2 – A-3.

505 Commandant of the Marine Corps, *MCO 3500.110 Policy and Guidance for Mission Essential Task List (METL) Development, Review, Approval, Publication and Maintenance*, A-1.

506 Ibid., A-1 – A-2.

A METL includes "all METs that a unit is organized, trained, and equipped to perform. An assigned METL is the set of all core, core plus, and assigned METs for a unit critical to a single mission, operation, or deployment."[507]

The essential purpose of the METL, then, is to provide "the foundation for training plan development and subsequent readiness assessment and reporting."[508]

In summary, from the Joint Force perspective (whether the CJCS or a CCDR), any military unit can be conceived of as its METL combined with unit capacity. For example, a MET-ready (twelve-aircraft) VMM can sustain sixteen TRAP sorties a day during contingency or combat operations. Because METs address "what" and not "why, when, where, or how," to a JFC, a VMM is simply a capacity (sixteen sorties) applied to a METL (e.g., TRAP) for an output (e.g., "sixteen available daily TRAP sorties"). In this way, the ultimate output for any unit is its METs and METs are the fundamental way in which Service capabilities interface with JFC requirements.

This has two major consequences for air intelligence. The first, already stated, is that it is not possible for a unit G/S-2's training to factor into DRRS readiness reporting. The second is that because the essential mission of a unit is to exercise its METs, any support MOS (e.g., intelligence) should orient its unit G/S-2 T&R events on how the MOS supports the unit's output (i.e., deriving T&R events from the supported unit METs).

For a squadron, where intelligence sections are not functionally organized, but organized to directly support the supported unit, most intelligence T&R events should be directly linked to supported unit METs. For a functionally-organized element, such as the ACI, T&R events can be

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[507] Commandant of the Marine Corps, *MCO 3502.6A Marine Corps Force Generation Process*, 2.

[508] Commandant of the Marine Corps, *MCO 3500.110 Policy and Guidance for Mission Essential Task List (METL) Development, Review, Approval, Publication and Maintenance*, B-4.

oriented on the functions of the ACI’s sections and cells so long as the functional design of the element is organized to support the METs of the supported unit (in the ACI’s case, the TACC).

For example, an 0207, serving as the S-2 of a VMM that has the MET “MCT 6.2.1.1 Conduct Aviation Support of Tactical Recovery of Aircraft and Personnel (TRAP)” would be trained in, among other things, a T&R event such as “Provide Intelligence Support to Aviation TRAP Operations” (that encompasses the MCT description for the MET in question, as listed in Appendix B). Similarly, an 0207 serving in the ACI’s Target Validation Cell would be trained in, among other things, a T&R event such as “Direct ACE Target Validation” (that encompasses the target validation responsibilities, production requirements, and support requirements for that cell as articulated in MCRP 3-20F.2). Appendix F explores these operational support T&R events in further detail.

APPENDIX B

AVIATION COMBAT ELEMENT MISSION ESSENTIAL TASKS

Because any unit G/S-2 T&R framework must support and nest under the mission of the unit to be supported and because METs fundamentally describe what a unit's output is, they take on central importance in developing the intelligence T&R framework recommended by this research. Table 9 lists all Core and Core Plus METs for standard ACE formations.

Table 9. ACE METs

		ACE Units												
MCT	**Task**	**HMH**	**HMLA**	**VMA**	**VMFA (FA-18)**	**VMFA (F-35)**	**VMGR (KC-130J)**	**VMM**	**VMU**	**MEU ACE**	**MEB ACE**	**MAG (TR/RW)**	**MAG (FW)**	**MAW**
MCT 1.1.2	Provide Task-Organized Forces											X	X	X
MCT 1.3.3	Conduct Aviation Operations									X	X			X
MCT 1.3.3.3	Conduct Aviation Operations From Expeditionary Sites											X	X	
MCT 1.3.3.3.1	Conduct Aviation Operations From Expeditionary Sea-Based Sites	+	+	+	+	+		X	+	X	X			
MCT 1.3.3.3.2	Conduct Aviation Operations From Expeditionary Shore-Based Sites	X	X	X	X	X	X	X	X					
MCT 1.3.4	Conduct Assault Support Operations									X	X	X	X	X
MCT 1.3.4.1	Conduct Combat Assault Transport	X	U				X	X						
MCT 1.3.4.1.1	Conduct Airborne Rapid Insertion/Extraction	+	U +					+						
MCT 1.3.4.2	Conduct Air Refueling						X							
MCT 1.3.4.2.1	Provide Aviation-Delivered Ground Refueling	+					X	+						
MCT 1.3.4.3	Provide Aviation-Delivered Battlefield Illumination						+	+						
MCT 2.2.5	Conduct Aviation Reconnaissance and Surveillance										X			
MCT 2.2.5.2	Conduct Multisensor Imagery Reconnaissance											X	X	X
MCT 2.2.5.2.2	Collect Combat and Intelligence Data			+	+	X	+		X					
MCT 3.2.3	Conduct Aviation Delivered Fires									X	X			
MCT 3.2.3.1	Conduct Offensive Air Support (OAS)											X	X	X
MCT 3.2.3.1.1	Conduct Close Air Support (CAS)		X	X	X	X	+							
MCT 3.2.3.1.1.1	Facilitate Close Air Support (CAS)								X					
MCT 3.2.3.1.2.1	Conduct Air Interdiction		A	X	X	X								
MCT 3.2.3.1.2.2	Conduct Armed Reconnaissance		X	X	X	X								
MCT 3.2.3.1.2.3	Conduct Strike Coordination and Reconnaissance (SCAR)		X	X	X	X			X					
MCT 3.2.3.2	Conduct Antiair Warfare [Offensive Antiair Warfare (OAAW)]		A +	+	X	X							X	X

MCT	Task	ACE Units												
		HMH	HMLA	VMA	VMFA (FA-18)	VMFA (F-35)	VMGR (KC-130J)	VMM	VMU	MEU ACE	MEB ACE	MAG (TR/RW)	MAG (FW)	MAW
MCT 3.2.3.2.1	Conduct Suppression of Enemy Air Defenses (SEAD)				X	X								
MCT 3.2.3.3	Conduct Aviation Electronic Attack (EA)					X								
MCT 3.2.5.4	Conduct Forward Air Control (Airborne) [FAC(A)]		X	+	+	+								
MCT 3.2.7.2	Control Indirect Fires								X					
MCT 3.2.7.5	Attack Enemy Maritime Targets				+	+								
MCT 4.3.4	Conduct Air Delivery	X	U				X	+						
MCT 4.3.8	Conduct Air Logistic Support Operations							X						
MCT 5.3.1.2	Exercise Tactical Command and Control											X	X	
MCT 5.3.2.7	Conduct Tactical Air Command Center (TACC) Operations													X
MCT 5.3.2.7.3	Conduct Tactical Air Coordination (Airborne) Operations		U +			+								
MCT 5.3.2.7.4	Provide an Airborne Command and Control Platform for Command Elements		U					+						
MCT 5.3.5	Control Aircraft and Missiles									X	X			
MCT 5.4.1.2	Conduct Electronic Warfare (EW)										X		X	
MCT 5.4.1.2.3	Conduct Electronic Support (ES)					X			+					
MCT 5.5.1	Integrate and Operate with Joint, Interagency, Intergovernmental and Multinational (JIIM) Organizations										X			
MCT 6.1.1.7	Conduct Anti-Air Warfare (AAW) (Air Defense)									X	X			
MCT 6.1.1.8	Conduct Active Air Defense		+	+	X	X								
MCT 6.1.1.11	Conduct Aerial Escort		X	+	+	+								
MCT 6.2.1.1	Conduct Aviation Support of Tactical Recovery of Aircraft and Personnel (TRAP)	X	X					X	+					
MCT 6.2.2	Conduct Air Evacuation	X	U											

Legend: "X"=Core MET, "+"=Core Plus MET, "A"/"A+"=Core/Core Plus MET for AH-1s only, "U"/"U+"=Core/Core Plus MET for UH-1s only

Source: Data adapted from Headquarters, United States Marine Corps, *Task Master Task Sets.*

The descriptions for each of the METs in Table 9 then become central to ensuring that any derivative intelligence T&R events comprehensively support the MET(s) against which they are aligned. These METs identify the full operational requirement for aviation and therefore an intelligence T&R framework developed to support the full scope of these METs will be comprehensive in its ability to support the entirety of Marine aviation.

MCO 3500.26A Universal Naval Task List publishes MCTs and their descriptions but is outdated. The MCTIMS website offers the most up-to-date METs and their descriptions. Thus, all task descriptions below are verbatim from the MCTIMS website. As a component of the task description, where applicable, the Joint and Service publications (or other source) where the task can be derived from or that explain its conduct are listed in parentheses. These descriptions, below, should be used as the basis for corresponding air intelligence T&R events supporting these operational tasks (as discussed in Appendix C, such operational support T&R events, while critical, are not the only T&R events required).

MCT 1.1.2 Provide Task-Organized Forces
The Marine Corps organizes its operational forces as Marine Corps components and as MAGTFs to provide task-organized, self-sustaining, multipurpose forces to the joint force or naval expeditionary force. These uniquely organized Marine Corps forces can respond to a wide range of operational and tactical missions and tasks, providing an unmatched combination of deployment and employment options. This task includes prepositioning operations. (JP 1, 0-2, 3-0, MCDP 1-0, MCWP 3-33.7, MCRP 3-33.7A, MCO 3104.1)

MCT 1.3.3 Conduct Aviation Operations
To conduct offensive aviation operations to defeat, destroy or neutralize the enemy. To use speed, range, mobility, and agility of aviation assets to maximize concentration and flexibility in the defense, ensuring that adequate battlespace is assigned to employ all the capabilities of available aviation. Marine Corps aviation is capable of operating in any environment; however, weather can adversely affect its effectiveness in performing some functions such as assault support and reconnaissance. Longer periods of employment will require increased maintenance efforts and excess sorties. (JP 3-0, MCDP 1-0, MCWP 3-2 Series)

MCT 1.3.3.3 Conduct Aviation Operations From Expeditionary Sites
Marine aviation's expeditionary character sets it apart from all other organizations. The MAGTFs power-projection capability is based on its ability to move rapidly and operate freely within an objective area anywhere in the world. Marine aviation can operate from amphibious platforms, Forward Operating Bases (FOBs), forward expeditionary land bases, carriers (as an integral part of carrier air groups), or any combination thereof. (JP 3-0, MCWP 3-2)

MCT 1.3.3.3.1 Conduct Aviation Operations From Expeditionary Sea-Based Sites
Marine aviation units maintain the capability to operate from Naval shipping (amphibious platforms, carriers, maritime prepositioning ships …, etc.) in line with platform and unit capabilities. This task includes prepositioning operations. (JP 3-0, MCWP 3-2)

MCT 1.3.3.3.2 Conduct Aviation Operations From Expeditionary Shore-Based Sites
Marine aviation units maintain the capability to operate from expeditionary shore-based sites (in line with unit/platform capabilities) to include Forward Operating Bases (FOBs), Expeditionary Airfields (EAFs), Forward Arming and Refueling Points (FARPS), austere forward operating sites, Tactical Landing Zones …, Helicopter Landing Zones (HLZs), etc. The Marine Air Traffic Control Mobile Team … can support operations at expeditionary shore-based sites by providing

initial rapid response air traffic control …, and command, control, and communications …. (JP 3-1, NDP 1, MCWP 3-2, MCWP 3-25.8)

MCT 1.3.4 Conduct Assault Support Operations

Assault support uses aircraft to provide tactical mobility and logistic support to the MAGTF for the movement of high priority personnel and cargo within the immediate area of operations (or the evacuation of personnel and cargo). It also uses Marine aerial refueler transport squadrons (VMGRs) to provide in-flight refueling. Assault support gives the MEF Commander the mobility to focus and sustain his combat power at decisive places and times. It allows the MEF Commander to take full advantage of fleeting battlespace opportunities. There are three levels of assault support: tactical, strategic, and operational. (JP 3-0, MCWP 3-11.4, 3-2, 3-24)

MCT 1.3.4.1 Conduct Combat Assault Transport

Aviation combat assault transport operations provides mobility to the MAGTF. It is used to deploy forces (air-landed or air-delivered) efficiently in offensive maneuver warfare, bypass obstacles, or quickly redeploy forces. Combat assault support allows the MAGTF Commander to build up his forces rapidly at a specific time and location, and allows him to apply and sustain combat power and strike the enemy where he is unprepared. This function comprises those actions required for the airlift of personnel, supplies and equipment into or within the battle area by helicopter, tiltrotor or fixed wing aircraft. (JP 3-0, 4-0, MCWP 3-2, MAWTS-1)

MCT 1.3.4.1.1 Conduct Airborne Rapid Insertion/Extraction

Airborne rapid insertion/extraction is the planned insertion/movement of forces conducted rapidly followed by a planned and rapid withdrawal. Helicopter Rope Suspension Techniques … provides Marines with the ability to conduct insertions and extractions where landings are impractical. Airborne rapid insertion/extraction includes methods such as rappelling, fast rope, special patrol insertion and extractions, etc. (MCWP 3-2, 3-11.4, 3-24, MCRP 3-11.4A)

MCT 1.3.4.2 Conduct Air Refueling

Aerial refueling allows MAGTF aircraft, both fixed- and rotary-wing, to conduct Tactical and Force extension operations, extend time on station, and extend mission range. The Marine Aerial Refueler Transport Squadron (VMGR) has the primary task to provide the tactical aerial refueling service to Marine aviation units. (JP 3-0, 3-04, 4-0, 4-01, 4-03, MCWP 3-2, NDP 1, 4, NWP 3-01.10, 3-22.5 Series, 3-56.1, 4-01, 4-08)

MCT 1.3.4.2.1 Provide Aviation-Delivered Ground Refueling

Rapid ground refueling (RGR) is a method of providing fuel to aircraft and tactical ground vehicles (TGV) utilizing KC-130 and CH-53 aircraft in austere locations, where no other source of fuel is readily available. This method of refueling permits operation of fixed- and rotary-wing aircraft and TGV without the requirement to commit the significant logistical assets necessary to operate helicopter expeditionary refueling systems …, or tactical airfield fuel dispensing systems…. RGR can also quickly resupply established forward-arming and refueling (FARP) sites and forward-operating bases (FOB). The capability of the KC-130/CH-53 to operate as a tactical ground refueler enhances MAGTF operations. (ANTTP 3-22.3-KC-130)

MCT 1.3.4.3 Provide Aviation-Delivered Battlefield Illumination

Battlefield illumination can be provided by both fixed-wing and rotary-wing aircraft.

Illumination may be visible to the naked eye or invisible (i.e., visible only with night vision equipment) and can last for a few minutes or several hours. Illumination of targets aids in target identification and designation and aids in controlling the guidance system of friendly ordnance. (JP 3-0, 3-09 Series, MCWP 3-2, NWP 3-05 Rev D, NTTP 3-13.1, 3-22.2, NTA 3.2.8.2)

MCT 2.2.5 Conduct Aviation Reconnaissance and Surveillance

Air reconnaissance supports the MAGTF intelligence warfighting function providing critical intelligence that supports the operational planning process. The MAGTF Commander uses air reconnaissance to gain intelligence that is vital to the shaping of the battlespace, assists him in understanding the tactical situation, alerts him to new opportunities, and allows him to assess the effects of MAGTF operations on the threat. Intelligence gathered during air reconnaissance missions provides the MAGTF Commander with a rapid means of acquiring visual, imagery, and electronic information on enemy activity and installation and the terrain. The Marine Corps relies on a mix of organic, theater, and national air reconnaissance sources to support its intelligence, planning, deployment and operational phases when executing air reconnaissance.

MCT 2.2.5.2 Conduct Multisensor Imagery Reconnaissance

Air reconnaissance employs visual observation and/or sensors in airborne platforms to acquire intelligence information. It primarily supports the intelligence warfighting function, although it also contributes significantly to command and control (C2), maneuver, fires, logistics, and force protection. It is employed tactically, operationally, and strategically. The three types of air reconnaissance are visual, multisensor imagery, and electronic. All aircraft units constantly perform visual air reconnaissance; other air reconnaissance platforms can be equipped with sensors to conduct other than visual reconnaissance. Air reconnaissance provides information for the formulation of plans and policies at the national and international level. Tactical air reconnaissance obtains specific information about terrain, weather, and the enemy. MEFs normally conduct tactical air reconnaissance using a variety of aircraft (manned and un-manned) as well as national assets. (JP 2-0, 3-0, MCDP 2, MCWP Series, 3-2, 3-26, 3-33.7, MCO 3104.1_, COMCAM ALSA/MTTP, NDP 2, NWP 2-01)

MCT 2.2.5.2.2 Collect Combat and Intelligence Data

Imagery reconnaissance detects and pinpoints the location of enemy installations and facilities and concentrations of enemy forces. It also supports terrain analysis. Imagery is recorded from sensors (e.g., cameras, radar, infrared devices) and other collateral equipment in or on the aircraft. It is either optical or non-optical. Organic GEOINT analysis provide near real time data exploitation. The Marine Corps relies on mix of tactical, theater, and national air reconnaissance assets to support its imagery collection requirements in planning and executing MAGTF operations. (JP 2-0, 3-0, MCWP 2-21, 3-2, 3-26)

MCT 3.2.3 Conduct Aviation Delivered Fires

The MAGTF Commander, based on recommendations by the ACE Commander, determines the allocation of aviation effort within the MAGTF. The air section assists the current fires section and is directly responsible for all matters pertaining to the use of aviation fire assets in battle. It maintains close contact with the Marine Tactical Air Command Center (TACC), monitors the Air Tasking Order (ATO), and focuses on reactive targeting in the MAGTF deep battle per targeting principles. Electronic attack is considered a form of fires. (JP 1, 0-2, 3-0, 3-01, 3-02, 3-01.1, 3-01.4, 3-01.5, 3-03, 3-05, 3-05.2, 3-06, 3-07.1, 3-07.2, 3-08, 3-09, 3-09.1, 3-09.3, 3-10.1, 3-18, 3-30, 3-31, 3-51, 3-52, 3-53, 3-60, MCWP 3-2, 3-16, 3-22, 3-22.2, 3-23, 3-23.1, 3-23.2, 3-24, 3-25, 3-25.4, 3-26)

MCT 3.2.3.1 Conduct Offensive Air Support (OAS)
Offensive air support (OAS) is conducted against enemy installations, facilities, and personnel to directly assist in the attainment of MEF objectives by the destruction of enemy resources or the isolation of his military force. Its primary support of the warfighting functions is to provide fires and force protection through CAS and DAS. The firepower, mobility, and flexibility provided by OAS are critical in establishing favorable conditions for deep, close, and rear operations. The principal effects created by OAS are neutralization and destruction. (JP 1, 0-2, 3-0, 3-01, 3-01.1, 3-01.4, 3-01.5, 3-03, 3-05, 3-05.1, 3-05.2, 3-06, 3-07.1, 3-07.2, 3-08, 3-09, 3-09.1, 3-09.3, 3-10.1, 3-18, 3-30, 3-31, 3-40, 3-51, 3-52, 3-53, 3-60, MCWP 3-2, 3-23, 3-24, 5-11.1, NDP 1, NWP 01.01, 3-01.10, 3-01.12, 3-22.5 Series, 3-56, NAVYWIDE AIR WARFARE PLAN)

MCT 3.2.3.1.1 Conduct Close Air Support (CAS)
Close Air Support (CAS) operations are performed by fixed-wing and rotary-wing aircraft against hostile targets that are in close proximity to friendly forces. CAS requires detailed integration of each air mission with the fire and movement of friendly forces (JP 1, 0-2, 3-0, 3-09.3, 3-30, 3-31, MCWP 3-2, 3-23, 3-23.1, 3-24, 5-11.1, NDP 1, NWP 3-05, 3-09.11M)

MCT 3.2.3.1.1.1 Facilitate Close Air Support (CAS)
To facilitate air support operations which includes preplanned and immediate close air support (CAS) missions, positive identification of friendly forces and positive control of aircraft, and to enhance ground force operations by delivering a wide range of weapons and massed firepower at decisive points. (JP 1, 0-2, 3-0, 3-09.3, 3-30, 3-31, MCWP 3-2, 3-23, 3-23.1, 3-24, 5-11.1, NDP 1, NWP 3-05, 3-09.11M)

MCT 3.2.3.1.2.1 Conduct Air Interdiction
Air interdiction operations destroy, neutralize, or delay the enemy's military potential. This type of operation is a response to a known target that is briefed in advance. Air interdiction is normally part of the JFC campaign. (JP 1, 0-2, 3-0, 3-03, 3-09, 3-30, 3-31, MCWP 3-2, NDP 1, NWP 3 Series)

MCT 3.2.3.1.2.2 Conduct Armed Reconnaissance
Armed reconnaissance missions find and attack targets of opportunity (i.e., enemy materiel, personnel, facilities) in assigned areas. An armed reconnaissance operation is a response to targets that are not known or briefed in advance. (JP 1, 0-2, 3-0, 3-09, 3-30, 3-31, MCWP 3-2, 3-25.10)

MCT 3.2.3.1.2.3 Conduct Strike Coordination and Reconnaissance (SCAR)
Strike Coordination and Reconnaissance (SCAR) missions acquire, report, and coordinate the destruction of targets. SCAR aircraft may discover enemy targets and provide a target mark or talk-on for other Armed Reconnaissance missions or accurately locate targets for Air Interdiction missions. SCAR missions can be flown by any Armed Reconnaissance aircraft that has been assigned an area to coordinate the attacks of other DAS flights. (MCWP 3-2, 3-23, 3-23.2, MCRP 3-25H)

MCT 3.2.3.2 Conduct Antiair Warfare [Offensive Antiair Warfare (OAAW)]
Offensive Anti-air Warfare (OAAW) missions are conducted against enemy air assets and air defense systems before they can be launched or assume an attacking role. OAAW operations in or near the objective area consist mainly of air attacks that destroy or neutralize hostile aircraft, airfields, radar, air defense systems, and supporting areas. OAAW also includes attacks against enemy theater missile operations and suppression of enemy air defenses (SEAD). Offensive counterair … is the joint term for an operation that destroys, disrupts, or limits enemy air power as close to its source as possible. This task seeks to gain control of the air and then allow friendly forces to exploit this control. (JP 1, 0-2, 3-0, 3-01, 3-01.4, 3-09, 3-30, 3-31, MCWP 3-2, 3-22, 3-22.2, 3-25.4, NDP 1, NWP 3 Series)

MCT 3.2.3.2.1 Conduct Suppression of Enemy Air Defenses (SEAD)
Suppression of Enemy Air Defenses (SEAD) missions coordinate, integrate, and synchronize attacks, which neutralize, destroy, or temporarily degrades surface or subsurface-based enemy air defenses by destructive and/or disruptive means. (JP 1, 0-2, 3-0, 3-01, 3-01.4, 3-09, 3-30, 3-31, MCWP 3-2, 3-22, 3-22.2, 3-25.4, NDP 1, NWP 3-03, 3-03.4, 3-13.1, 3-56.1)

MCT 3.2.3.3 Conduct Aviation Electronic Attack (EA)
Electronic Attack (EA) is that division of electronic warfare involving the use of electromagnetic energy, directed energy, or anti-radiation weapons to attack personnel, facilities, or equipment with the intent of degrading, neutralizing, or destroying enemy combat capability. EA is considered a form of fires and includes: 1) actions taken to prevent or reduce an enemy's effective use of the electromagnetic spectrum, such as jamming and electromagnetic deception, and 2) employment of weapons that use either electromagnetic or directed energy as their primary destructive mechanism (i.e., lasers, radio frequency weapons, particle beans). (JP 1-02, 3-0, 3-51, MCWP 3 Series, NDP 1, NWP 3 Series, NTTP 3-12.2)

MCT 3.2.5.4 Conduct Forward Air Control (Airborne) [FAC(A)]
The forward air controller (airborne) [FAC(A)] is an aviator specifically trained, qualified, and designated to perform air reconnaissance and surveillance, conduct terminal control of aircraft engaged in offensive air support (OAS) operations, control artillery and naval surface fire support missions, act as a radio relay as required by ground forward air controllers, and control landing zone preparations (including the marking of landing zones). The FAC(A) exercises control from the air or aircraft engaged in close air support (CAS) of ground troops, and is normally an airborne extension of the TACP [Tactical Air Control Party]. Within the Marine Corps, the FAC(A) is a naval aviator and/or naval flight officer. (MCWP 3-2, 3-25.3, 3-26)

MCT 3.2.7.2 Control Indirect Fires
To coordinate, control and deliver fire on a target that is not itself used as a point of aim for the weapons or the director, or fire delivered at a target which cannot be seen by the aimer. Technical aspects of weapons delivery must be applied to ensure that fires fall at the time and place intended. Fire support must be cleared through the appropriate fire support coordination agency (FSCC/[Supporting Arms Coordination Center]/FFCC [Force Fires Coordination Center]/etc.) to ensure known or likely friendly force locations are not targeted, avoiding errors and possible fratricide. Supporting arms coordination involves the correct application of call-for-fire and fires adjustment procedures specified for observers and Naval Gun Fire … spotters operating either from a ground position or aircraft (manned and unmanned). Target

misidentification or location, computational errors, weapon mechanical malfunction, and communication errors should be considered by Commanders and planners when selecting employment locations, trajectory considerations, and selection of weapon types for employment. (JP 1-02, 3-09, 3-16, FMFM 2-7, MCWP 3-16.6)

MCT 3.2.7.5 Attack Enemy Maritime Targets
To attack sea targets with the intent to degrade the ability of enemy forces to conduct coordinated operations and/or perform critical tasks. This task includes all efforts taken to control the battlespace by warfare commanders, including strikes against high payoff and high value targets, such as missile launching ships and submarines, and other strike and power projection units throughout the theater. This task also includes those efforts taken to undermine the enemy's will to fight. (JP 1, 3-0, 3-03, 3-05, 3-07, 3-09, NDP 1, NWP 2-01, 3 Series)

MCT 4.3.4 Conduct Air Delivery
Air delivery is in-flight transportation of equipment and supplies to remote areas or expeditionary sites [tactical landing zones, austere forward operating sites, Naval shipping, Forward Operating Bases (FOBs), Expeditionary Airfields (EAFs), Forward Arming and Refueling Points (FARPs), etc.]. Air delivery operations are performed by fixed-wing, tilt-rotor or rotary-wing aircraft. Delivery can be accomplished with aircraft internal/external loads, or loads can be air dropped using specially rigged aerial delivery equipment and systems. Air drops are normally used when surface of helicopter transports cannot be used because of range, closed lines of communications, a lack of adequate airfields, a prohibitive ground tactical situation, high tonnage, or reduced response time. The Helicopter Support Team … may be used during air delivery operations. Air delivery operations require detailed planning and integration at all levels and must support units in a rapidly changing environment. This task includes prepositioning operations. (JP 1, 3-0, 4-0, MCWP 3-2, 3-11.4, 3-21.2, 4-1, 4-11, 4-11.3, NDP-4, NWP 4-01, NAVSUP PUB Series)

MCT 4.3.8 Conduct Air Logistic Support Operations
Air logistic support provides support of MAGTF forces by fixed-wing and tilt-rotor aircraft. Air logistic support delivers troops, equipment, and supplies to areas beyond helicopter range and lift capability or when surface transportation is slow or unavailable. This task includes prepositioning operations. (MCWP 3-2)

MCT 5.3.1.2 Exercise Tactical Command and Control
Tactical command and control provides purpose and direction to the varied activities of a military unit. It is the means by which the Commander recognizes what needs to be done and sees to it that appropriate actions are taken. Tasks include: to order warfare degrees of readiness; to direct asset assignment, movement, and employment; and, to control tactical assets, including allied and joint forces assigned. (JP 1-02, 3-0, 5-0, 5-00.2, MCDP 1-0, 6, NDP 6, NWP 3-21, 3-21.0 Rev A, 3-56.1 Rev A, 6-00.1, NTA 5.4.1.2)

MCT 5.3.2.7 Conduct Tactical Air Command Center (TACC) Operations
The principal air command agency for the ACE is the Tactical Air Command Center (TACC). It provides the command post and capabilities necessary from which the ACE Commander and staff, plan, supervise, integrate, coordinate, direct, execute, and assess all MAGTF aviation operations between the MACCS and air command and control agencies external to the MAGTF,

to include other Services or Host Nation agencies. This includes deep operations; personnel recovery operations; the execution of all air tasking orders (ATOs); and airspace control orders (ACOs); and, the execution of the Wing operation order … or fragmentary order (FRAGO). The TACC is the senior Marine Air Command and Control System (MACCS) agency and integrates these functions with the MAGTF command element through linkage with the force fires coordination center (FFCC) and combat operations center (COC). The TACC provides functional interface for employment of MEF aviation in joint and multinational operations. It maintains and disseminates the status of friendly/enemy ground and air assets, conducts targeting, and facilitates the operation of the Air Tasking Cycle, which produces the ATO/ACO. (JP 3-0, 5-0, 5-00.2, MCWP 3-2, 3-25.4, NDP 6, NWP 6-00.1)

MCT 5.3.2.7.3 Conduct Tactical Air Coordination (Airborne) Operations
A Tactical Air Coordinator (Airborne) [TAC(A)] is an officer who coordinates, from an aircraft, the action of combat aircraft engaged in close support of ground or sea forces. Within the MACCS, the TAC(A) is a naval aviator and/or naval flight officer. The TAC(A) is the senior air coordinator and has air authority over all aircraft operating in an assigned area. The TAC(A)'s primary mission is to act as an airborne extension of the DASC, TACC, and/or FSCC. The TAC(A) contributes to coordination among TACPs, FAC(A)s, and the fire direction of artillery and naval gunfire. (MCWP 3-2)

MCT 5.3.2.7.4 Provide an Airborne Command and Control Platform for Command Elements
An airborne Command and Control platform is a tactical mission aircraft used to coordinate and control tactical helicopter assaults, troop movement, Commander's reconnaissance, and other related tactical missions. Marine Light/Attack Helicopter Squadron(s) (HML/A) are tasked to provide an airborne Command and Control platform (UH-1). (MCWP 3-2, 3-11.4, 3-24, 3-26)

MCT 5.3.5 Control Aircraft and Missiles
The control of aircraft and missiles integrates the other five functions of Marine aviation by providing the Commander with the ability to exercise command and control authority over Marine aviation assets. It enhances unity of effort and disseminates a common situational awareness, and involves the integrated employment of facilities, equipment, communications, procedures and personnel. It allows the ACE Commander to plan operations and to direct and control aircraft and missiles to support accomplishment of the MAGTF's mission. The ACE Commander maintains centralized command, while control is decentralized and executed through the Marine Air Command and Control System (MACCS). (JP 3-01.5, 3-09, 3-52, MCWP 3-2, 3-25, 3-40.1)

MCT 5.4.1.2 Conduct Electronic Warfare (EW)
Electronic Warfare (EW) is any military action involving the use of electromagnetic and directed energy to control the electromagnetic spectrum or to attack the enemy. Aviation EW supports the warfighting functions of fires, command and control, and intelligence through the three major subdivisions: electronic attack (EA), electronic protection …, and electronic warfare support (ES). Planning and execution procedures for airborne electronic warfare (EW) is similar to those used for ground EW. The most significant difference between ground and airborne support requirements is time; timeliness of airborne EW is critical in a fast-paced aviation operation. Airborne ES missions are conducted by VMAQ [Marine Tactical Electronic Warfare Squadron]

EA-6B assets in general support of the MEF, as directed by the MEF Commander. Special platforms that perform ES and/or EA in support of MEF operations may be requested through the [Joint Task Force]/theater Commander. (JP 1, 3-0, 3-13, 3-51, MCWP 3-2, 3-40.5, NDP 6, ALSA Pub EWO-J (Electronic Warfare Operations In A Joint Environment), NWP 6-00.1, NWP 13.1.1)

MCT 5.4.1.2.3 Conduct Electronic Support (ES)
To conduct that division of electronic warfare involving actions tasked by, or under direct control of, an operational Commander to search for, intercept, identify, and locate or localize sources of intentional and unintentional radiated electromagnetic energy for the purpose of immediate threat recognition, targeting, planning, and conduct of future operations. This task provides enemy electronic emissions (i.e., communications and radar) data to analysts for updating the electronic order of battle (EOB). This task employs land, sub-surface, airborne, shipboard, and space sensors to complement perishable information obtained by other sources and includes providing, either on a time-share or dedicated basis, assets or asset protection to meet the Commander's needs in a tactical environment. Electronic warfare support (ES) provides information required for decisions involving electronic warfare operations and other tactical actions such as threat avoidance, targeting, and homing. Electronic warfare support data can be used to produce signals intelligence, and provide targeting for electronic attack, as well as, update theater and national EOB. (JP 1-02, 3-51, MCWP 2-22, 3-2, 3-40.4, 3-40.5, NTA 5.5.4)

MCT 5.5.1 Integrate and Operate with Joint, Interagency, Intergovernmental and Multinational (JIIM) Organizations
To integrate and coordinate Marine Corps units, capabilities, and efforts with combined forces and forces from other nations, intergovernmental and interagency organizations, nongovernmental organizations, and United Nations forces and capabilities, required to generate decisive joint combat power. Joint Force Commanders (JFCs) synchronize and integrate the actions of air, land, sea, space, and special operations forces to achieve strategic and operational objectives through integrated, joint campaigns and major operations. The goal of JIIM integration is to increase the total effectiveness of the joint force, not necessarily to involve all forces or to involve all forces equally. This task includes prepositioning operations. (JP 3-0, 3-05, 3-05.1, 3-16, MCO 5050.14, MCO 5600.48B, MCRP 3-25A, MCWP 3-36, MCWP 3-40.7, NAVMC 2500)

MCT 6.1.1.7 Conduct Anti-Air Warfare (AAW) (Air Defense)
Anti-air Warfare (AAW) refers to the actions undertaken to destroy, or reduce to an acceptable level, the enemy air and missile threat. Anti-air warfare's primary purpose is to gain and maintain a degree of air superiority that allows the MEF to conduct aviation and ground operations without prohibitive interference from enemy aircraft and missiles. AAW also refers to the methods taken to minimize the effects of hostile air action, such as cover, concealment, dispersion, deception, and mobility. Electronic warfare missions support AAW through the denial of [Early Warning/Ground Controlled Intercept] and communications to enemy forces. (JP 1, 3-0, 3-01.2, 3-04, 3-56.1, MCDP 1-0, MCWP 3-2, 3-22, 3-25, 3-25.3, 3-25.4, 3-25.6, NDP 1, NWP 1.01, 3-01.10, 3-01.12, 3-22.5 Series, 3-56, NAVYWIDE AIR WARFARE PLAN)

MCT 6.1.1.8 Conduct Active Air Defense
Active air defense includes action taken to destroy, nullify, or reduce the effectiveness of hostile

air and missile threats against friendly forces and assets. This task includes the use of aircraft, air defense weapons, electronic warfare, and other available weapons. The JRA [Joint Rear Area] coordinator coordinates with the area air defense Commander to ensure that air defense requirements for the JRA are integrated into air defense plans. Active air defense prevents enemy use of airspace through fire potential or other means without direct attack of air targets. (JP 1, 3-0, 3-01 Series, 3-0, MCWP 3-2, 3-22, 3-25, 3-25.3, 3-25.6, 3-25.10, 3-26, NDP 1, NWP 3 Series)

MCT 6.1.1.11 Conduct Aerial Escort

Aerial escort forces accompany and protect another force or convoy. Aerial escorts may be assigned to airborne or ground forces. Escorts can be either attached or detached where escort aircraft fly as part of the formation when attached and separate when detached. The escorts' primary function is to defend the assigned mission force against enemy attack. (JP 3-0, MCWP 3-11.4, 3-2, 3-23, 3-24, MCRP 5-12A)

MCT 6.2.1.1 Conduct Aviation Support of Tactical Recovery of Aircraft and Personnel (TRAP)

Support of TRAP operations consists of a unit, detachment, aircraft/platform, etc., providing one or more aviation functions during a TRAP mission. Aviation TRAP support functions include air evacuation, Close Air Support (CAS), air control, airborne surveillance, Suppression of Enemy Air Defenses (SEAD), aerial escort, etc. (MCWP 3-2, 3-24, 3-25.4)

MCT 6.2.2 Conduct Air Evacuation

Air evacuation is the transportation of personnel and equipment from areas of operations to secure rear areas, to include casualty evacuations (CASEVAC), extraction of forces, or civilians. Transport helicopters, tiltrotor, and fixed-wing transport aircraft perform air evacuations. (JP 3-10.1, MCDP 1-0, MCWP 3-2, 3-11.4, 3-16, 3-24, 3-25, 3-27, 3-36)[509]

[509] Headquarters, United States Marine Corps, *Marine Corps Task List*, Marine Corps Training Information Management System. November 14, 2018. https://mctims.usmc.mil/TNRManual/TaskMaster/Pages/MarineCorpsTaskList.aspx

APPENDIX C

AIR INTELLIGENCE CONCEPT

Developing billet-based training for air intelligence necessitates the identification of billets and their roles and responsibilities. Fundamentally, this requires a concept for *how* air intelligence supports Marine aviation. The *means* responsible to execute the concept's *ways* (the *how*) are, in part, intelligence elements with defined billets, each with defined roles and responsibilities, across Marine aviation. These roles and responsibilities then become training requirements attached to each billet, enabling the subsequent development of training syllabi.

Without such a concept, it is not possible to define training requirements, codify them in the T&R manual, and then train to them because there are no support requirements articulated for training to be tailored to. This has essentially been the state of air intelligence for three decades and is almost certainly a major cause of the severe training shortfalls it continues to experience.

Thus, a fully-articulated air intelligence concept is necessary because the entirety of air intelligence organization, training, and equipping is derived from it.

While not formally articulated since Lieutenant Colonel Ingram's thesis, elements of this concept exist.

In a way, the ACI in MCRP 3-20F.2 is a set of means applied to the concept Lieutenant Colonel Ingram's developed in his thesis. This includes both a T/O for the ACI as well as the duties and responsibilities of each section within it. However, intelligence T&R has ignored ACI training requirements since 2006 with the second Intelligence T&R Manual. In this way, all air intelligence training since then has been developed from intuition or happenstance and not any defined requirement or concept.

There exists no concept for a MAG or Squadron S-2. Nor is there clear articulation in operational publications and doctrine of what each echelon is responsible for depending on the presence or absence of other echelons.

An air intelligence concept is also essential for organizing and equipping intelligence elements. For units with organic G/S-2s, such a concept is essential to validate or update their Table of Organization and Equipment [T/O&E]. For units to be supported by the WISC, such a concept is essential to define the size, composition, and equipment of the DST to be attached to the unit.

While measuring the capability and capacity of a DST or intelligence section against a concept's requirements inherently involves some degree of subjectivity (mitigated by the creation of a CMMR, described in Appendix I), the absence of a concept incurs much greater subjectivity as any unit can reasonably justify their current capabilities and capacity as adequate, regardless of whether it is so (because there is no requirement against which to evaluate). In the same manner, any unit G/S-2 can be reduced (whether by leveraging excessive collateral duties on intelligence Marines or by reducing the size of the intelligence section to be deployed) without the intelligence section being capable of measuring or articulating the loss in capability, capacity, or the risk incurred by such a decision.

Where a CMMR is highly specific and prescriptive for a normalized mission (permitting adjustment based on mission analysis), a concept should articulate broad intelligence capabilities (e.g., 'able to PED organic collections from Weapon System Video [WSV]') and capacity (e.g., 'able to provide twenty-four-hour intelligence support at a hub and spoke location for a sustained sortie rate of sixteen') in a comparatively generic manner. This permits the concept to remain relatively static (perhaps changing only when new TMSs, significant new operational or collection capabilities are introduced, or when significant new intelligence or operations requirements are introduced) and for a CMMR to be a more dynamic and more objective definition of the Organize, Train, and Equip (OTE) *means* required to execute the concept's *ways*.

Recommending a complete concept is beyond the scope of this research, however developing a T&R framework requires at least a simplified concept on which to build.

Any air intelligence concept should support the four basic methods of employment for the ACE:

- squadrons deployed alone (as in a MEU ACE or a small Special Purpose Marine Air Ground Task Forces [SPMAGTF])—detachments deployed alone (as in a small SPMAGTF) may be treated as squadrons
- MAGs deployed with squadrons, but without the presence of the MAW echelon
- MAWs deployed with squadrons, but without the presence of the MAG echelon
- MAWs deployed with MAGs and squadrons

Developing a concept that supports the range of these four modes of employment can be done by making four basic assumptions.

The first assumption is that some operations are inherently tied to a single geographic location. Thus, while a MAG or squadron may be spread over multiple operating sites, some units of action (sortie launch and recovery) take place at a single specific location. The consequence for intelligence is that intelligence support tied to this activity (e.g., briefing, debriefing, and limited PED to exploit WSV) is also inherently tied to geographic location.

The second assumption is that missions and tasks are assigned to organizations (i.e., a singular squadron, MAG, or MAW). Thus, while a MAG may be spread over multiple operating sites, it is responsible for planning in support of a coherent task or set of tasks. Alternatively, while two MAGs may be co-located, they will be responsible for two distinct coherent tasks or task sets. The consequence of this is that intelligence support tied to this activity (e.g., COA and CONOPS development) is inherently tied to organizations, requiring a unit G/S-2 capable of supporting mission (i.e., COA/CONOPS) planning, briefing and execution.

The third assumption is that the ACE normally supports a unified battlespace. Thus, while an infantry regiment may segment a single regimental battlespace into multiple battalion battlespaces, the ACE does not normally segment subordinate units according to these divisions (e.g., that MAG's singular VMM squadron will not be assigned to support a singular battlespace, but the entire MAGTF [or JFC] battlespace, according to a set prioritization or support relationship). Thus, while each regimental subordinate unit (battalion) operates in a single segment of the battlespace, the corresponding MAG's subordinate units (squadrons) operate in all segments of the battlespace. For infantry intelligence units in this example, the consequence is that a battalion S-2's responsibilities are similar to those of a regimental S-2, but smaller in scope. The consequence for air intelligence, by contrast, is that the senior ACE echelon G/S-2 is aligned to the unified battlespace and has corresponding responsibilities (e.g., targeting intelligence support, order of battle tracking) while subordinate ACE echelon S-2s are not aligned to the battlespace and will have different (non-battlespace-aligned) responsibilities.

The fourth assumption is that when all three echelons of the ACE are present, the MAGTF is engaged in major combat operations and squadrons will conduct limited mission-based (i.e., organizationally-aligned) planning. Instead, this planning will happen at the MAG-level or higher, integrating multiple TMS squadrons for single missions (e.g., escorted assault support or escorted strikes). The consequence for intelligence is that in this situation, organizationally-aligned support is not necessary below the MAG.

Based off of this characterization of ACE employment, the simplified intelligence concept identifies three primary modes of intelligence support to the ACE:

- geographically-aligned (e.g., sortie briefing and debriefing, WSV PED)
- organizationally-aligned (e.g., COA/CONOPS planning support)
- battlespace-aligned (e.g., ACI support to the TACC)

When a squadron deploys alone, it requires both geographically- and organizationally-aligned support. When squadrons deploy with a single higher headquarters (MAG or MAW), the squadrons require the same support and the headquarters requires battlespace-aligned and organizationally-aligned support (i.e., an appropriately-scaled TACC). When all three echelons are present, squadrons require geographically-aligned support, MAGs require organizationally-aligned support, and MAW requires organizationally-aligned and battlespace-aligned support.

When geographically-aligned support is defined as supporting sortie briefing, debriefing, and limited WSV PED, organizationally-aligned support is defined in terms of supporting mission planning (i.e., execution of squadron METs), and battlespace-aligned support is defined as an ACI in support of a TACC, this provides sufficient fidelity to begin deriving a T&R framework and specific T&R events.

This is only a simplified concept, however. Marine air intelligence will have to develop a more comprehensive and detailed concept in the future as these modes of intelligence support are refined. To this end, this research makes five discrete recommendations.

First, such a concept, when developed, should be written into MCRP 2-10A.9 and replace elements of its current chapter seven (Aviation Mission Support).

Second, a more detailed concept should result in an updated ACI T/O. The current T/O has remained unchanged for more than twenty years. Beyond discrepancies with current MOS structure, there are significant updates to be made based on advances in connectivity, software capabilities, and doctrinal updates with respect to operations that must be supported (e.g., operations in the information environment or cyberspace operations).

Third, MACG should be included as an integral element of this concept. The historic neglect of air intelligence support to MACG has led to its own vicious cycle where air intelligence does not adequately support MACG units (in garrison or when deployed) and, as a consequence, MACG units have little appetite for intelligence support and disregard the proper use and training of the few intelligence Marines they have. This has broader consequences that are easy to speculate about but almost entirely undocumented (the lack of documentation, itself, indicating the degree of neglect this area endures). For example, in my own anecdotal experience, the DASC has routinely (but unknowingly) provided pilots in my squadron routing that crosses high-threat areas despite geographic threat assessments being available (but which was not provided to the DASC) on which to overlay these control points. The mitigation I put in place was to brief my pilots the high-threat control points so that they could request alternative routing from the DASC when directed to use them. A better solution would have been to provide increased intelligence support to the DASC so that they would not unknowingly route aircraft through high-threat areas. This example makes clear the possibility that increased intelligence support to MACG may have a multiplicative effect across the entire ACE.

Fourth, Lieutenant Colonel Ingram's concept should be used as a departure point. His concept stands as the only academic study that approached the intelligence functions necessary for ACE operations, resulting in the generation of the modern ACI. However, elements of it must be updated. When he pointed out that "The least-likely employment of the ACE intelligence organization is as a Marine Aircraft Wing," it was 1988. With Vietnam fading into the past and the Cold War still on, it seemed like the future of conflict was either on the order of Grenada and

Panama or all-out nuclear war with the Soviets.[510] In a few short years, Operations DESERT SHIELD/DESERT STORM would demonstrate the importance of the MAW as a modern combat formation. More recently, Operations IRAQI FREEDOM and ENDURING FREEDOM would do the same. Marine aviation maintains the requirement to deploy across the ROMO, responding with a squadron (or only a detachment), with a MAG, or with a MAW. And operations over the last two decades have offered myriad permutations of ACEs. Thus, as Lieutenant Colonel Ingram's air intelligence concept is updated, it must be flexible for each of those ACE employment models.

Fifth, such a concept will need to address the rank changes Force 2025 will be making to MAG and F-35 squadron intelligence officer billets. The elevation of MAG intelligence officers to the rank of major and the creation of a captain 0277 BICs on F-35 squadron T/Os was a plan developed prior to and independent of the WISC. And given that the WISC radically alters the roles and responsibilities of the residual organic MAG S-2s and the potential intelligence support of the F-35, these changes should be revisited as they may degrade overall intelligence support and create potentially harmful career paths.

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[510] Ingram, "Marine ACE Intelligence Support," 62.

APPENDIX D

TRAINING AND READINESS FRAMEWORK

The air intelligence T&R framework recommended by this research includes T&R events for qualifications, certifications, and syllabi of individual qualifications linked to specific billets. Qualifications are for individual skills (in three categories) and certifications are evaluations of the aggregate individual skills (demonstrated in a collective environment) necessary to provide support for a specified supported unit or element of the ACI.

This is a modification of the Aviation T&R Program's RCQD framework.

The Aviation T&R Program uses RCQD as the 6000-level phase of training, for "Training Events required by other directives, Events that lead to specific certifications, qualifications, and/or designations, and other Events requiring tracking."[511] These feed into the CMMR (discussed in greater detail in Appendix I): "CMMR numbers are determined by the community and derived only from the Mission Skill Phase, Core Plus Phase, and Combat Leadership (from the Requirements, Certification, Qualification, Designation (RCQD) Phase)."[512]

Because neither WISC DSTs nor unit G/S-2s are units, their readiness cannot be measured by any analogous Mission Skill Phase or Core Plus Phase events (as these are derived from METs and, as described in Appendix A, G/S-2s cannot have METs). Thus, this research recommends using a modified RCQD framework in the Intelligence T&R Manual as the primary

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[511] Commandant of the Marine Corps, *NAVMC 3500.14D Aviation Training and Readiness Program Manual*, 2-1.

[512] Ibid., 2-4.

mechanism for tracking individual and collective training requirements (which then feed into CMMR requirements).

Definitions for elements of RCQD are not present in the Ground T&R Program or Intelligence T&R Manual. The definitions for the RCQD elements recommended by this research (qualifications, syllabi, and certifications), are adopted from the corresponding definitions in the Aviation T&R Program.

The Aviation T&R Program defines *qualifications*:

> Qualifications are assigned to personnel based on demonstration of proficiency in a specific skill. All qualifications are assigned one or more required T&R Events. When all qualification requirements are completed and proficient, the individual may be granted the respective qualification by the commanding officer or in the case of aviation ground communities, as directed in the community T&R Manual. An individual's qualification status may be either "Qualified" or "Not Qualified." At least one requirement/event for a qualification must have a proficiency period assigned. Under exceptional circumstances (Waiver), an Event may be determined to be not required.[513]

This study recommends defining *qualification* for air intelligence as:

> Qualifications are assigned to personnel based on demonstration of proficiency in a specific skill. All qualifications are assigned one or more required T&R events. When all qualification requirements are completed and proficient, the individual may be granted the respective qualification by the commanding officer or as directed in the Intelligence T&R Manual. An individual's qualification status may be either "Qualified" or "Not Qualified." At least one requirement/event for a qualification must have a proficiency period assigned. Under exceptional circumstances an event may be determined to be not required and a waiver is issued by the commanding officer.

Intelligence qualifications fall into three categories: threat, operational support, and instructor.

The Aviation T&R Program defines *syllabus*: "All events for a PMOS, or in unique situations by crew position, within a community."[514]

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[513] Ibid., 2-11.
[514] Ibid., 2-3.

This study recommends defining syllabus for air intelligence as: "All events for a unique billet in a G/S-2, supporting a specific unit's METL, or in an ACI element."

The Aviation T&R Program defines *certification*:

> A Certification refers to the formal endorsement of having attained a specialized skill. The evaluation process is conducted in accordance with the Certification event(s) by a designated instructor or authorized personnel … A formal Certification letter will be presented in accordance with the community T&R. Certifications may require a proficiency period.[515]

This study recommends defining *certification* for air intelligence as:

> A Certification refers to the formal endorsement of a collective unit having attained the specialized skills required to support a designated unit as demonstrated by a certification exercise that requires the demonstration of all individual qualifications required to support a designated unit. The evaluation process is conducted in accordance with the Certification event(s) by a designated instructor or authorized personnel (determined by unit commander). A formal Certification letter will be presented in accordance with the Intelligence T&R Manual. Certifications may require a proficiency period.

Intelligence certifications, then, are collective T&R events that demonstrate collective competencies that aggregate individual qualifications, as identified by the individual syllabi for the corresponding supported unit, through an evaluated certification exercise.

The T&R, through the CMMR, will articulate syllabi by billet in each DST as well as the additional qualification (e.g., instructor) necessary for each individual in a DST. It will also articulate the collective certification(s) required of that DST. CMMR is discussed further in Appendix I.

With respect to the coding of these events, the Ground T&R Program and the Intelligence T&R Manual categorizes events as depicted in Figure 22.

[515] Ibid., 2-10.

Individual Training **Entry-Level Formal School Training (Core Skills)**	**Individual Training** **Skills Progression MOJT, Advanced Level Schools (Core Plus Skills)**	**Collective Training** **Crew/Team**
1000-level	2000-level	3000-level
Collective Training **Squad/Section**	**Collective Training** **Platoon**	**Collective Training** **Company**
4000-level	5000-level	6000-level
Collective Training **Battalion/Squadron**	**Collective Training** **Regiment/Group**	**Collective Training** **Command Element**
7000-level	8000-level	9000-level

Figure 22. Ground T&R Event Levels. Commandant of the Marine Corps, NAVMC 3500.100B Intelligence Training and Readiness Manual, Enclosure (1), 1-4.

Therefore, all entry-level training for 0207s is at the 1000-level. All entry-level training for 0271s (as an NMOS, not PMOS) is at the 2000-level. Beyond these formal events, individual qualifications will be 2000-level events. Certifications, as collective training, will occupy the 3000-5000 range according to the following tiers:

- 3000-level: squadron DSTs, ACI cells, and any Flight Line Intelligence Center (FLIC)-level training[516]
- 4000-level: ACI sections
- 5000-level: ACI.

3000-level collective events would include, either as event components or as chained events, the individual 2000-level events necessary to complete the 3000-level collective event. For ACI events, 4000-level events would, in the same fashion, encompass the relevant 3000-level events. And the 5000-level event exercising the entire ACI would similarly encompass ACI 4000-level events.

[516] Because the FLIC remains an ill-defined support element without a clear CONEMP, it falls outside the scope of this research. However, as the concept becomes more clearly-defined, with a CONEMP that would support T&R event generation, it is likely that any corresponding certification events for it would be at the 3000-level.

With this framework established, it then becomes necessary to determine the scope for an event, answering the questions of: what is a discrete event, when do two or more support activities fall within one event, and when is one activity best split into two or more events?

The UTM Program defines an event as “a significant training occurrence that is identified, expanded and used as a building block and potential milestone for a unit’s training.”[517] This definition is too vague to be useful in determining how many events are needed to provide intelligence support across the entire ACE, let alone what they should be or how they should be bounded.

This research expands this definition with the addition of four criteria to aid in this analysis:

- the necessary supporting intelligence products
- the intelligence considerations
- intelligence processes or the operational/planning processes to be supported with intelligence
- the level of knowledge or action (i.e., doing vice evaluating or directing)

Any distinction in one or more of these criteria would indicate the need to consider a distinct event. An example of this is provided in Appendix F.

Because the WISC is not designed to be *operationally*-employed as a full company (just as MACG is not designed to be operationally-employed as a Group but rather as components of the MACCS), this research does not recommend any 6000-level company collective training for the WISC. To maintain simplicity with the introduction of a new framework, this research recommends that any reach-back support provided by the WISC be conducted by Marines training to operate within an ACI, thus providing initial and sustainment training for WISC

[517] Commandant of the Marine Corps, *MCO 1553.3B Unit Training Management (UTM) Program*, Enclosure (1), 1-1.

Marines when they provide reach-back support to deployed units while also reducing the need for additional events at the adoption of a new framework. As this framework matures and as additional Service ISR concepts develop (such as Joint Processing, Exploitation, and Dissemination), this approach should be adjusted.

This framework requires the drafting of a substantial number of T&R events (sixty-five). Such a number is likely to put off some air intelligence practitioners who seek only incremental modification to the five draft T&R events (for 0207 and 0271 entry-level training) today and invites the question 'are so many truly necessary?' This can be answered in two ways.

First, the idea that a full half of the entire MAGTF's maneuver forces can be adequately supported by thirteen separate MOSs, with only between one and ten events is absurd, *prima facie*. Unfortunately, this has been the case since 2006. The history of air intelligence, the previous research that this study builds upon, and the adoption of the WISC itself all consistently acknowledge this inadequacy in existing training. Additionally, in 1999, the air intelligence chapter of the T&R manual included 205 events (for one MOS alone), establishing a precedent of two orders of magnitude more events than we have today.

Second, the number of truly unique events (i.e., those events with completely unique event components rather than events which are modifications or derivative of others) proposed by this research is only twenty-six. For individual events, the differentiation of responsibilities between analyst and leadership positions takes a singular baseline event and splits it for differences in billet responsibilities based on rank/MOS. This effectively halves the individual events from fifty-one. The remaining fourteen events are (collective) certification events whose event components are largely a compilation of subordinate events (thus, making these events derivative of the 2000-level events).

Thus, only twenty-six unique individual events and fourteen (somewhat derivative) collective events must be written. All sixty-five events will require a unique description, but even the majority of these (the operational support events) can be derived either from the ACI component roles and responsibilities in MCWP 3-20F.2 or the supported MET descriptions in Appendix B. The remainder of the T&R events are largely comprised of administrative data that require minimal effort to draft.

Finally, a T&R implementation order must be developed and used at least at each WISC (where T&R completion would be tied to DRRS readiness and thus an essential element of unit operations). This will necessitate unit-level procedures to ensure T&R events are scheduled and executed, with all the attendant procedures (e.g., scheduling training non-availability, remediation of events, waiving event components due to resource shortfalls). These issues are outside the scope of this research.

Within the scope of this research, however, these SOPs, like the flight SOPs used by aviation units, should provide for standardization boards to identify gaps in current official publications, from doctrine to the T&R manual, and develop mitigations. These boards will provide a regular avenue for feedback to these publications (for example, if a T&R event is written with such stringent requirements that elements are regularly waived due to resource shortfalls, data to support modification of the event can be collected and brought up at the next T&R conference; alternatively, if a WISC develops training requirements outside the T&R manual to support a new concept or mode of employment, these requirements can be evaluated for inclusion as a T&R event in the next conference).

APPENDIX E

THREAT QUALIFICATIONS

The current AIOC and SITCC draft T&R events include one event (at each school) for understanding air and air defense threats. An entry-level comprehension of the threat is insufficient for a comprehensive T&R framework, however. Thus, some advanced threat events are necessary.

At least six threat events can be derived. The first two are basic threat events (the AIOC and the SITCC events). These should teach to all threats at a basic familiarization level. (0202s without an 0207 background should be required to be trained to the entry-level 0207 event.)

The other four events should require more advanced air threat analysis, tailored both to the likely threat faced by supported aircraft type based on mission and to the experience level of the Marine to be trained (i.e., analyst vs. section chief/Officer in Charge [OIC]).

Because different TMSs operate in two different generic threat envelopes, the event supporting HMLAs, HMHs, VMMs, VMGRs, and Marine Unmanned Aerial Vehicle Squadrons (VMU) should focus on SAMs and ADA while the event supporting VMAs and VMFAs should focus on aircraft and SAMs. These two focus areas would have an analyst version of the event tailored to understanding and providing intelligence products and a leadership version of the event tailored to quality control of produced products and the integration of threat knowledge into planning. Each of these events would chain or require as a pre-requisite the MOS-appropriate entry level threat event, ensuring broad understanding of all air and air defense threats as well as facilitating training sustainment.

Theoretically, there would also be a seventh threat event, to qualify 0277s as threat SMEs. However, because of the unique relationship of WTI with the T&R manual (see

Appendix L), this research recommends only one placeholder 0277 event to cover all 0277 training requirements.

This six-event threat T&R framework enables training to the full spectrum of threats at the familiarization level while also affording the ability to train to greater detail and understanding on threats most likely to impact the specific platforms supported. Additionally, this permits ACI threat training to be reduced in cells or sections where it is less relevant (e.g., the BDA cell does not need advanced threat training, but the Target Development cell would).

There will certainly be a challenge in articulating this advanced knowledge in a form appropriate for T&R event components, however this particular challenge is outside the scope of this research.

As a final note on threat T&R event composition, the relevant threat publications for any event (e.g., *AFTTP 3-1.Threat Guide*) should be included as references to any supporting intelligence T&R event. This might appear an obvious observation, however the Intelligence T&R Manual has historically been deficient in this area.

APPENDIX F

OPERATIONAL SUPPORT QUALIFICATIONS

Friendly-centric or operational-support events cover categories of similar METs that require the same or nearly the same intelligence support. What is important in this grouping process is not necessarily how the tasks (i.e., supported units METs) themselves differ but rather how the *intelligence support* to the tasks differ. The following two examples are illustrative of this point.

MCT 1.3.4.1 Conduct Combat Assault Transport is "is used to deploy forces (air-landed or air-delivered) efficiently in offensive maneuver warfare, bypass obstacles, or quickly redeploy forces;" MCT 4.3.4 Air Delivery "is in-flight transportation of equipment and supplies to remote areas or expeditionary sites [tactical landing zones, austere forward operating sites, Naval shipping, Forward Operating Bases (FOBs), Expeditionary Airfields (EAFs), Forward Arming and Refueling Points (FARPs), etc.];" and MCT 6.2.2 Air Evacuation is "the transportation of personnel and equipment from areas of operations to secure rear areas, to include casualty evacuations (CASEVAC), extraction of forces, or civilians. Transport helicopters, tiltrotor, and fixed-wing transport aircraft perform air evacuations."[518]

All three of these are essentially the travel of an aviation platform from an origin point to an interim point, the delivery or receipt of personnel, equipment, or materials, and travel of that aviation platform to a destination point, which may be the same as the origin point (i.e., point A to B to C). Using the event differentiation criteria from Appendix D, it can be determined that a singular intelligence T&R event is required to support all three MCTs. For intelligence

[518] Headquarters, United States Marine Corps, *Marine Corps Task List*.

personnel, the support requirements are essentially identical in products, considerations, and processes (both intelligence processes and the operational/planning processes being supported) and therefore a singular qualification would support all three of these METs. This might be called ‘Provide Intelligence Support to General Assault Support Operations’ (the differentiation between analysts and OICs/Chiefs in doing versus directing would result in a pair of similar events, differentiated along these lines).

Conversely, while MCT 6.2.1.1 Conduct Aviation Support of Tactical Recovery of Aircraft and Personnel (TRAP) is also ‘point A to B to C,’ it includes an additional dimension for both aviation planners and intelligence personnel in that it requires the coordination with the theater or regional Joint Personnel Recovery Center (JPRC), familiarity with Combat Search And Rescue Special Instructions, Isolated Personnel Report information, evasion plans, and other actions.

Thus, supporting MCT 6.2.1.1 requires distinct intelligence products, considerations, and supported operational/planning processes. It would therefore be supported by a qualification distinct from the qualification supporting MCTs 1.3.4.1, 4.3.4, and 6.2.2. This event might be ‘Provide Intelligence Support to Aviation TRAP.; However, because MCT 6.2.1.1 shares the same ‘point A to B to C’ elements of ‘Provide Intelligence Support to General Assault Support Operations’ (and merely adds additional intelligence support and coordination requirements on top), it might include ‘Provide Intelligence Support to General Assault Support Operations’ as an event component (or otherwise chain the event) and omit these general elements, including only the specialized TRAP components.

In this manner, the forty-two unique supported aviation METs can be translated into a number of distinct supporting intelligence T&R events.

Table 10 groups all supported ACE METs in this manner.

Of the forty-two distinct METs in Appendix B, only forty-one are listed in Table 10. MCT 1.1.2 is omitted because it does not include any operational components with the exception of pre-positioning of forces, which would require the execution of other MCTs, such as MCT 1.3.4.1, or would be conducted under administrative conditions (i.e., the coronet flight of aircraft from the U.S. to deployed sites).

Additionally, MEU ACE METs, as documented in MCTIMS, are abstracted one level from single-TMS squadrons [i.e., instead of multiple discrete assault support MCTs, they are contained in a single MCT 1.3.4 Conduct Assault Support]. Thus, strictly using the methodology applied to other ACE elements, the MEU ACE only requires two supporting intelligence T&R events to support: Provide Intelligence Support to Squadron Aviation Operations and ACI events. However, this is not consistent with this matrixing for any other ACE element. Thus, in Table 10, the MEU ACE METs depicted are carried over from the TMSs that comprise an F-35 MEU ACE and these one-level abstracted events are removed.

This framework makes clear the need for nine squadron-centric operational support events (doubled to eighteen when accounting for an analyst and a chief/OIC version) and a category of 'ACI events' which would break out in a manner consistent with the ACI structure as articulated in MCRP 3-20F.2 (discussed further, below).

Generally, leadership (i.e., chief and OIC) qualifications should be tailored to support operational planning and providing quality control to intelligence products generated by analysts. And these analyst qualifications, in turn, should be tailored to developing products and supporting execution. For example, "Provide Intelligence Support to Aviation TRAP" for a junior (i.e., lance corporal to sergeant) 0271 might include the requirement to understand and

Table 10. Proposed Operational-Support Intelligence T&R Event Families

Syllabus	MCT	Task	HMH	HMLA	VMA	VMFA (FA-18)	VMFA (F-35)	VMGR (KC-130J)	VMM	VMU	MEU ACE	MEB ACE	MAG (TR/RW)	MAG (FW)	MAW
			ACE Units												
Provide Intelligence Support to Squadron Aviation Operations	MCT 1.3.3.3.2	Conduct Aviation Operations From Expeditionary Shore-Based Sites	X	X	X	X	X	X	X	X	X				
	MCT 1.3.3.3.1	Conduct Aviation Operations From Expeditionary Sea-Based Sites	+	+	+	+	+		X	+	X	X			
Provide Intelligence Support to General Assault Support Operations	MCT 1.3.4.1	Conduct Combat Assault Transport	X	U				X	X		X				
	MCT 1.3.4.1.1	Conduct Airborne Rapid Insertion/Extraction	+	U+					+		X				
	MCT 4.3.4	Conduct Air Delivery	X	U				X	+		X				
	MCT 6.2.2	Conduct Air Evacuation	X	U							X				
	MCT 4.3.8	Conduct Air Logistic Support Operations							X		X				
	MCT 1.3.4.2	Conduct Air Refueling						X							
	MCT 1.3.4.3	Provide Aviation-Delivered Battlefield Illumination						+	+		X				
	MCT 1.3.4.2.1	Provide Aviation-Delivered Ground Refueling	+					X	+		X				
Provide Intelligence Support to Aviation TRAP	MCT 6.2.1.1	Conduct Aviation Support of TRAP	X	X					X	+	X				
Provide Intelligence Support to General Offensive Air Support Operations	MCT 3.2.3.1.1	Conduct Close Air Support (CAS)		X	X	X	X	+			X				
	MCT 3.2.3.1.2.1	Conduct Air Interdiction		A	X	X	X				X				
	MCT 3.2.3.1.2.2	Conduct Armed Reconnaissance		X	X	X	X				X				
	MCT 3.2.3.1.2.3	Conduct Strike Coordination and Reconnaissance (SCAR)		X	X	X	X			X	X				
	MCT 3.2.5.4	Conduct Forward Air Control (Airborne) [FAC(A)]		X	+	+	+				X				
	MCT 6.1.1.11	Conduct Aerial Escort		X	+	+	+				X				
	MCT 3.2.7.5	Attack Enemy Maritime Targets				+	+				X				
Provide Intelligence Support to Offensive Antiair Warfare Operations	MCT 3.2.3.2	Conduct Antiair Warfare [Offensive Antiair Warfare (OAAW)]		A+	+	X	X				X			X	X
	MCT 6.1.1.8	Conduct Active Air Defense		+	+	X	X				X				
	MCT 3.2.3.2.1	Conduct Suppression of Enemy Air Defenses (SEAD)				X	X				X				
Provide Intelligence Support to Air Reconnaissance Operations	MCT 2.2.5.2.2	Collect Combat and Intelligence Data			+	+	X	+		X	X				
	MCT 2.2.5	Conduct Aviation Reconnaissance and Surveillance										X			
	MCT 2.2.5.2	Conduct Multisensor Imagery Reconnaissance											X	X	X
Provide Intelligence Support to Airborne C2 Operations	MCT 5.3.2.7.3	Conduct Tactical Air Coordination (Airborne) Operations		U+			+				X				
	MCT 5.3.2.7.4	Provide an Airborne Command and Control Platform for Command Elements		U					+		X				
Provide Intelligence Support to Airborne Electronic Warfare Operations	MCT 3.2.3.3	Conduct Aviation Electronic Attack (EA)					X				X				
	MCT 5.4.1.2.3	Conduct Electronic Support (ES)					X			+	X				
Provide Intelligence Support to UAS C2 Operations	MCT 3.2.3.1.1.1	Facilitate Close Air Support (CAS)								X	X				
	MCT 3.2.7.2	Control Indirect Fires								X	X				
ACI Events	MCT 1.3.3	Conduct Aviation Operations										X			X
	MCT 1.3.3.3	Conduct Aviation Operations From Expeditionary Sites											X	X	
	MCT 1.3.4	Conduct Assault Support Operations										X	X	X	X
	MCT 3.2.3	Conduct Aviation Delivered Fires										X			
	MCT 3.2.3.1	Conduct Offensive Air Support (OAS)											X	X	X
	MCT 5.3.1.2	Exercise Tactical Command and Control											X	X	
	MCT 5.3.2.7	Conduct Tactical Air Command Center (TACC) Operations													X
	MCT 5.3.5	Control Aircraft and Missiles										X			
	MCT 5.4.1.2	Conduct Electronic Warfare (EW)										X		X	
	MCT 5.5.1	Integrate and Operate with JIIM Organizations										X			
	MCT 6.1.1.7	Conduct Anti-Air Warfare (AAW) (Air Defense)										X			

brief the information, material, and support provided by the JPRC and to debrief the returning crew whereas a senior (i.e., staff sergeant or gunnery sergeant) 0271 or an 0207 might include the requirement to plan and conduct coordination with the JPRC and review the MISREP generated by the analyst.

Using this construct, a 0271 or 0207 qualified to support an HMH would be qualified in:

- Provide Intelligence Support to Squadron Aviation Operations
- Provide Intelligence Support to General Assault Support Operations
- Provide Intelligence Support to Aviation Tactical Recovery of Aircraft and Personnel Operations

These three qualifications would comprise the 'HMH Syllabus.' Such an HMH-qualified Marine, if re-designated to support a VMM assigned only Core METs, would need to complete an additional qualification for:

- Provide Intelligence Support to Aviation TRAP

These four qualifications would comprise the 'VMM Core Syllabus.' And if that VMM's newly-assigned mission included Core Plus METs, the Core-VMM-qualified Marine would need to complete the qualification for:

- Provide Intelligence Support to Airborne C2 operations

These five qualifications would comprise the 'VMM Core Plus Syllabus.'

Based off the tentative air intelligence concepts presented in Appendix C, Table 10 makes the assumption that those ACE elements above the squadron support their subordinate units by operating an ACI (or in the case where all three echelons are present, the MAG provides this operational planning support and only briefing and debriefing take place at the squadron). This permits the 'ACI Events' portion of Table 10 to be broken out by ACI section and cell.

Using the adjusted ACI manning recommended in Table 13 (in Appendix I), the necessary operational support events to support an ACI can be derived from the ACI's own organization and the billet positions.

Table 11 presents these operational support events for the ACI. (The coding of these events is customized to facilitate logical presentation of the events and is not reflective of the method for determining T&R event coding as prescribed by the T&R manual.)

Table 11. ACI Operational Support Events

Section / Billet Description	2000-Level Event	3000-Level Event	4000-Level Event	5000-Level Event
Air Combat Intelligence				
ACI Officer Assistant ACI Officer ACI Chief Assistant ACI Chief	0200-TACC-2002			INTL-TACC-5001
ACI Operations Assistant ACI Operations Assistant	0271-TACC-2003			
Intelligence Analysis Section				
Intelligence Analysis Officer Assistant Intelligence Analysis Officer	0202-TACC-2004		INTL-TACC-4001	INTL-TACC-5001
All Source Intelligence Cell				
Senior Analyst Chief Analyst	0200-TACC-2005		INTL-TACC-4001	INTL-TACC-5001
Intelligence Analyst Intelligence Analyst	0271-TACC-2006			
Order of Battle Cell				
Order of Battle Analyst Order of Battle Analyst	0271-TACC-2007		INTL-TACC-4001	INTL-TACC-5001
Imagery Analysis Cell				
Imagery Interpreter Imagery Interpreter	TBD		INTL-TACC-4001	INTL-TACC-5001
SIGINT Section				
SIGINT Officer SIGINT Chief SIGINT Support Clerk SIGINT Analyst	TBD	INTL-TACC-3001		INTL-TACC-5001
Collections Section				
Collections Officer	0200-TACC-2008			

Section / Billet Description	2000-Level Event	3000-Level Event	4000-Level Event	5000-Level Event
Assistant Collection Officer Collection Chief		INTL-TACC-3002		INTL-TACC-5001
Collection Clerk	0271-TACC-2009			
Targeting Intelligence Section				
Target Intelligence Officer Assistant Target Intelligence Officer Target Intelligence Chief	0200-TACC-2010		INTL-TACC-4002	INTL-TACC-5001
Target Development Cell				
Target Development Officer	0207-TACC-2011		INTL-TACC-4002	INTL-TACC-5001
Target Analyst Target Analyst	0271-TACC-2012			
Target Validation Cell				
Target Validation Officer	0207-TACC-2013		INTL-TACC-4002	INTL-TACC-5001
Target Analyst Target Analyst	0271-TACC-2014			
Battle Damage Assessment Cell				
BDA Officer	0207-TACC-2015		INTL-TACC-4002	INTL-TACC-5001
BDA Analyst BDA Analyst	0271-TACC-2016			
Intelligence Plans Section				
Intelligence Plans Officer Intelligence Plans Chief	0200-TACC-2017	INTL-TACC-3003		INTL-TACC-5001
Intelligence Plans Analyst	0271-TACC-2018			
Requirements and Dissemination Section				
Research and Development Officer Assistant Research and Development Officer	0200-TACC-2019	INTL-TACC-3004		INTL-TACC-5001
Research and Development Clerk Research and Development Clerk	0271-TACC-2020			
Intelligence Systems Section				
Systems Officer Systems Chief	0207/0271-TACC-2021	INTL-TACC-3005		INTL-TACC-5001
Weather Section				
Weather Officer Weather Forecaster Weather Forecaster Weather Observer Weather Observer	TBD	INTL-TACC-3006		INTL-TACC-5001
Radio Battalion Detachment				

Section / Billet Description	2000-Level Event	3000-Level Event	4000-Level Event	5000-Level Event
Detachment Commander ELINT Chief ELINT Analyst SIGINT Analyst SCI Communications Officer	TBD	INTL-TACC-3007		INTL-TACC-5001
Current Operations Intelligence Watch Section				
Intelligence Watch Officer Intelligence Watch Chief	0200-TACC-2022	INTL-TACC-3008		INTL-TACC-5001
Intelligence Watch Analyst	0271-TACC-2023			
ELINT Watch Analyst	TBD			
Future Operations Intelligence Watch Section				
Intelligence Watch Officer	0200-TACC-2024	INTL-TACC-3009		INTL-TACC-5001
Intelligence Watch Analyst	0271-TACC-2025			
Future Plans Intelligence Plans Section				
Intelligence Plans Officer Intelligence Plans Chief	0200-TACC-2024	INTL-TACC-3010		INTL-TACC-5001
Intelligence Plans Analyst	0271-TACC-2025			

All 2000-level events in Table 11 would include as a prerequisite 0200-TACC-2001, which would provide general training on ACI operations and general TACC knowledge necessary to support all subsequent 2000-level events (the 0200 MOS prefix is used to indicate that more than one 02xx MOS is performing). The event description and event components of the 2000-level events would be derived from MCRP 3-20F.2 and the MOSs performing would be derived from Table 13. Event components for 3000-, 4000-, and 5000-level events would be those subordinate level events (e.g., the 3000-level events to the left of a 4000-level event in Table 11).

Overall, this approach to operational support qualifications allows training requirements to be identified for Marines based upon the assigned METs of the supported unit. Then, using an air intelligence CMMR for the supported unit (see Appendix I), the completion of the T&R events that comprise these events (by billet within the DST) would present an objective measure of the readiness of air intelligence Marines to support the units scheduled for a deployment.

Further work is required to develop discrete rank/MOS events within the squadron-level operational support events. However, for all-source Marines (0271, 0207, and 0202), it is recommended that two tiers are used: chief/OIC and analyst.

Further work is also required to determine the requisite specialist MOS (e.g., 0241/0261/METOC/SIGINT) events that would support the ACI and, in select cases, squadrons. The requisite events may already exist in current the current Intelligence T&R Manual for the specialist MOSs.

As a final note on operational support T&R event composition, as a consequence of this supported unit MET derivation (and generally as good practice for any T&R event derivation method), the 'operational' publications relevant to the supported unit activity should be included as references to any supporting intelligence T&R event. Thus, any air intelligence support to an assault support MET event should include, as a reference, *Marine Corps Tactical Publication (MCTP) 3-20E Assault Support*. As with the similar recommendation for threat events in Appendix E, this might appear an obvious observation to make, however, the Intelligence T&R Manual has historically been deficient in this area.

APPENDIX G

INSTRUCTOR QUALIFICATIONS

This research finds instructor qualifications necessary because there is otherwise no necessary screening or education a Marine will receive to ensure they are effective communicators, knowledgeable on effective instruction techniques, familiar with the relevant elements of the science of learning, or knowledgeable about the T&R framework that they are to instruct. The debate around 'who trains the trainers' within Marine aviation demonstrates that proficiency in a particular skill is necessary but not sufficient to be an effective instructor and evaluator of that skill. Furthermore, the current state of the Ground T&R Program, where no special knowledge, experience, or qualifications are required to instruct and evaluate a T&R event is inadequate, *prima facie*.

The complexity of the instructor framework necessary is primarily a product of the degree of quality control desired, the personnel available, and the ability to designate qualified instructors from within that personnel pool. Stated another way: the instructor framework can neither be too simple, due to throughput limitations of the Intelligence WTI course that limit the ability to rely on 0277s alone, nor can it be too complex, due to the limitations imposed by personnel rotations that limit the return on investment of instructor qualifications. This research concludes the minimum complexity of an instructor framework is the use of 0277s as instructors, instructor trainers, and training program managers, analogous to 7577s within the Aviation T&R Program.

Within the Aviation T&R Program, 7577s are primarily used as instructors for comparatively high-complexity or tactics-centric events and as squadron Pilot Training Officers, who “develop and execute a unit training program in accordance with the WTTP.”[519]

This research anticipates, as does MAWTS-1, that such an evolution in the use of 0277s will require a commensurate increase in the minimum rank requirements for the MOS. Currently, the 0277 MOS is available to second lieutenant through lieutenant colonel and warrant officer through chief warrant officer five. And while not eligible for the MOS upon graduation, enlisted Marines as junior as corporals are admitted to the course. Transitioning to 0277s as unit instructors and training officers should raise the minimum rank requirements to sergeants or staff sergeants and first lieutenants or captains. This will match the rank/seniority of Intelligence WTI course attendees with the rank/seniority of billets instructing and managing training programs.

The personnel throughput of the Intelligence WTI course is also an important factor in determining the complexity required in an instructor framework.

If the Intelligence WTI course throughput is sufficiently low (which is the case), there will not be enough 0277s to fulfill all instructor requirements at the WISCs (and those units outside the WISCs). Consequently, a subordinate echelon of instructor is required to ensure that where an 0277 (a high degree of quality control) is not available, the alternative is not a complete lack of quality control.

MAWTS-1 has a current throughput of twelve Intelligence WTI students a year. The MAWTS-1 Sensitive Compartmented Information Facility can accommodate up to twenty-one students and has regularly done so in previous years, but beginning in spring 2019, MAWTS-1

[519] Commandant of the Marine Corps, *MCO 3500.109 Marine Corps Aviation Weapons and Tactics Training Program*, 7.

has capped Intelligence WTIs at twelve to focus on improving the quality of the course and its graduates.

Historically, MAWTS-1 graduates 97% of its intelligence students. And with two WTI courses a year, this results in an expected annual throughput of twenty-three 0277s. With a three-year PCS cycle (whereby Marines normally receive orders to their next duty station every three years), this provides for the ability to sustain sixty-nine 0277s billets (as current billet control mechanisms cannot ensure that an 0277 will return to fill an 0277 billet later in his or her career).

Of these sixty-nine, five billets reside at MAWTS-1, one at AIOC, and one at SITCC (it is assumed that SITCC will eventually require an 0277, once staffed with Marine instructors). This provides the OPFOR sixty-two 0277s, or almost twenty-one per WISC (the use of 0277s outside WISCs is addressed in further detail in Appendix L). This means each of the three WISCs can plan to have an upper limit of twenty-one 0277s on hand at any given time (each WISC gaining and losing one third of the available annual twenty-one-Marine throughput every year). (This math makes the assumption that the 0277 BMOS on BICs at units other than the WISC will be removed; see Appendix L for a further discussion of the disposition of the 0277 MOS.)

WISCs must assume that any 0277s necessary will be made within the PCS cycle. This is both a product of the elevation in rank requirements for 0277s but also the way in which billet MOS requirements are controlled.

BICs are coded to control billet MOS requirements in three ways: by BMOS, PMOS, and Additional Skills Designator (ASD). The PMOS indicates that a Marine receiving orders to fill a BIC must hold the indicated PMOS. As 0277 is an NMOS, no BICs are listed with the PMOS of 0277. A BIC may indicate a BMOS of 0277, which indicates the billet executes the duties of

0277. A BIC's BMOS is visible to M&RA and an attempt is made to send a Marine holding the indicated BMOS to fill the BIC—but the only requirement that M&RA must adhere to is the associated PMOS. Because of the complexities of manpower management, often as not a BIC with a specialized BMOS is filled with a Marine lacking the specified skill. Therefore, BMOS does not reliably ensure a Marine with that MOS is sent to fill the BIC.

As an alternative to BMOS-coding, a BIC may indicate an ASD of 0277, indicating that it is an additional skill (i.e., MOS) for the BIC. However, ASDs are not visible to M&RA when assigning Marines orders to fill a BIC, making it an ineffective MOS control mechanism for the purpose of assignments.

This is further complicated by rank restrictions on billets. For example, if 0277 is used primarily for roles filled by captains, it is unlikely that any newly-promoted captain, eligible for orders to a WISC, will have had cause to attend the Intelligence WTI course and therefore already hold the 0277 MOS. If a first-tour captain, in an 0277 billet, is sent to the course and receives the MOS, the assignments process makes it highly unlikely that he or she will be assigned to a WISC (or to any other 0277 billet) on their second tour as a captain. Similarly, any captain spending their first tour in grade outside the WISC will have had little cause to attend the Intelligence WTI course, causing the same problem. (This problem is less severe for enlisted Marines who may become 0277s as early as sergeant and return to WISCs up to the rank of master sergeant.)

Ultimately, the restriction in use of 0277s, while making them more effective as instructor trainers and training program managers, leads to a situation where virtually the only way to get the MOS is to be in a billet requiring it.

These factors force WISCs to assume that most any 0277s they need must be created within the three-year PCS cycle. Therefore, this theoretical limit (twenty-one per WISC) is reduced by the timeframe to receive a Marine at a WISC, assigned to fill an 0277 billet, send that Marine to the Intelligence WTI course, and receive him or her back with the 0277 NMOS. Given that PCS season is in the summer (normally June-July) and classes take place in September-October and March-April, this timeframe will be from four-to-eleven months.

This means a WISC may only have two-thirds of their 0277s on-hand with the other third waiting to class-up and graduate from the Intelligence WTI course. Thus, the WISCs' practical cap on 0277s on-hand is, in fact, fewer than fourteen.

Unfortunately, there remain yet more practical pressures that reduce available 0277s for training. The WISC will almost certainly be required to deploy 0277s (either because the high degree of qualification is necessary for a specific deployment or because there was no qualified alternative available). Additionally, Individual Augmentee and Fleet Assistance Program requirements are leveraged against a unit's on-hand personnel. Added to this are various personnel unavailable for extended periods due to administrative, medical, or legal reasons. And even fully-employable 0277s will take leave, attend off-site meetings, participate in required annual training (e.g., rifle range or fitness tests), or any other number of routine activities that render them not available to the WISC for training. Furthermore, 0277s will tend to be comparatively senior ranking officers and enlisted Marines, most of whom will hold important billets (e.g., commander, detachment OIC, operations officer) whose responsibilities will reduce their availability as an instructor. And lastly, each WISC will operate over three geographically-separated locations, further diminishing the available pool of personnel in any single location or ability to share 0277 resources between sites.

Because these drains on a unit's effective employable personnel vary, it is hard to calculate what additional percentage reduction in 0277s a WISC commander should use as a planning factor to calculate the actual number of 0277s he or she can count on to be available. What is certain, however, is there will be some negative impact.

The end result of this normal personnel attrition is that a WISC can only reasonably expect to have fewer than fourteen 0277s available on hand for the purposes of training on any given day (across three sites). This means that any training that requires 0277s must be feasible with an 0277 population of fewer than fourteen. (If MAWTS-1 increases throughput back to twenty-one students per class, the same math would increase the likely population of 0277s at any one WISC from fourteen to twenty-five or twenty-six.)

It is not unreasonable, then to conclude that some secondary, junior instructor qualification will be required.

In Marine aviation, the 7577-throughput issue is solved by a wide array of subordinate instructor qualifications: Low Altitude Tactics Instructor, Night Systems Instructor, NATOPS instructor, and so on. In this system, nearly every category of training has its own specific instructor.

This instructor framework is almost certainly too complex given the comparatively lower-density of intelligence MOSs and the lack of a career path that ensures air intelligence Marines remain in the air intelligence community.

The Marine Corps Martial Arts Program (MCMAP) offers a simplified model that most Marines should easily grasp. Such a model is more suited for the relatively simple instructor framework this study recommends. In MCMAP, there are three echelons of responsibility that sustain the program: the user, the instructor, and the instructor trainer. The user encompasses every Marine. The instructor has received special training and screening to qualify him or her as a Martial Arts Instructor and can, in turn, instruct and evaluate the progression of users up to and including the MCMAP belt level of the instructor. The instructor trainer has received even more rigorous special training and screening (available only at a few centers of excellence) to qualify him or her as a Martial Arts Instructor Trainer who can, in turn, provide the special training and screening to qualify users as new Martial Arts Instructors.

Adapting this model to air intelligence, MAWTS-1 would train 0277s at the WTI course and 0277s, at their units, would train and screen subordinate instructors. These instructors, in turn, would instruct and evaluate the T&R events that qualify individual Marines on the skills necessary for their billet. Especially complex training events (such as certification events) will be identified as requiring instruction and evaluation by 0277s. This subordinate instructor qualification may be as simple as a generic instructor training program (which would screen the candidate for qualities required of a good instructor and provide basic education on instructional techniques as well as the structure of the T&R manual), coupled with a current 'user' qualification in the event being instructed.[520]

Thus, qualification in event + basic instructor qualification = qualification to instruct and evaluate the same event (to include derivatives of the event, such as the analyst version of a chief/OIC event).

[520] There are a number of existing instructor curriculums in the Marine Corps, although study of them was outside the scope of this research. It is certainly possible to 'outsource' an element of the instructor qualification(s) by sending Marines to these courses. However, this involves a certain degree of risk and/or inefficiency. By creating a dependency on external training, the air intelligence community would be constraining itself to training parameters outside its control (e.g., school seats, scheduling, funding requirements). Additionally, just as with NIOBC before AIOC was created, if these programs are altered (either curtailed or extended in ways not beneficial for air intelligence requirements) air intelligence T&R will be subject to these otherwise-artificial inefficiencies or, if the programs are cancelled, find itself without an instructor program altogether.

If air intelligence training becomes more complex and sophisticated over the years, a more complex instructor model may need to be considered.

The alternative, of course, is requiring no qualification at all to instruct and evaluate events. As this is the current state of the Ground T&R Program that air intelligence modernization is attempting to move away from, this study assumes this alternative will not be seriously considered.

At a minimum, air intelligence instructor requirements, at all levels, should include instruction on the air intelligence T&R framework as well as on relevant readiness reporting outcomes that instruction of the appropriate parts of this framework seeks to achieve (i.e., how the training they conduct supports DRRS and how DRRS provides readiness metrics in support of the MAW's TEEP). This is because instruction itself is only a part of the training and evaluation context. The instruction takes place in order to achieve the readiness outcomes.

When it comes to the actual construction of the instructor qualifications, this research only addresses the 0277. Further work is required to determine the event components necessary for the subordinate instructor qualification.

This research can address the 0277 instructor qualification in a comparatively simple manner, however. Because MAWTS-1 has a special exemption from TECOM's normal formal course review process, it is unnecessary to write a detailed 0277 instructor event.[521] This exception provides the command freedom to adjust its POI as required. This is reconciled with aviation and aviation ground MOS T&R manuals by including a T&R event for the WTI

[521] Commandant of the Marine Corps 2015, *NAVMC 1553.2 Marine Corps Formal School Management Policy*, Enclosure (1), 1-4. MAWTS-1 is only required to submit Section I of the CDD for courses embedded within the WTI course. Section I consists of Block 16-Target Population Description and Course Prerequisites, Block 21-Instructor Staffing Requirements, Block 22-School Overhead, and Block 23-Training/Education Support Requirements.

qualification that only references the WTI course and, thus, retains the variability possessed by the WTI curriculum and its requirements. This makes it necessary to write a WTI event but only as a placeholder requiring course attendance. An example of this is provided in Figure 23.

2.12.13 <u>Weapons and Tactics Instructor (WTI)</u>

2.12.13.1 <u>Purpose.</u>

To certify the MV-22 pilot as a Weapons and Tactics Instructor (WTI) capable of safely conducting ground and airborne instruction of the MV-22 tactical flight syllabus.

2.12.13.2 <u>General.</u>

Reference the MAWTS-1 WTI Course Catalog for the detailed WTI POI.

<u>Crew Requirements</u>. Reference the MAWTS-1 Course Catalog for individual event requirements.

2.12.13.3 <u>WTI Overview</u>. Table7 provides the reference for WTI Overview.

Table 2-67: WTI Overview

EVENT	TIME	REFLY	POI	CONDITIONS	DEVICE	NUM	DESCRIPTION
WTI-5950		*	B				

<u>WTI-5950 * B,T E</u>

<u>Goal</u>. The PUI will receive all academic and flight instruction in accordance with the MAWTS-1 WTI Course Catalog.

Figure 23. WTI T&R Event for MV-22 Pilots. Commandant of the Marine Corps, NAVMC 3500.11E MV-22B Training and Readiness Manual, Enclosure (1), 2-177 - 2-178.

This research recommends the events currently comprising the 0277 T&R chapter be replaced in their entirety with the event recommended in Figure 30.

The MOS manual would also require a corresponding update, revising the ranks and MOSs eligible for the 0277 MOS.

Finally, this research tentatively recommends some form of intelligence Prospective Weapons and Tactics Instructor (PWTI) screening. This may simply be through unit SOPs or formalized in a PWTI T&R event. To achieve certain aviation qualifications, aviation T&R Manuals prescribe oral examinations conducted by squadron leadership on critical topic areas. Figure 25 provides an example of the T&R event for Tiltrotor Aircraft Commander Oral Examination.

0277-WTI-2001: Intelligence Weapons and Tactics Instructor

EVALUATION-CODED: YES **SUSTAINMENT INTERVAL**: None

DESCRIPTION: The WTI course certifies air intelligence Marines as Weapons and Tactics Instructors (WTI) capable of managing and conducting air intelligence training plans and capable of instructing and recommending the certification of air intelligence Marines in subordinate instructor positions and in all manner of other individual qualifications.

MOS PERFORMING: 0271, 0207, 0202

GRADES: Sgt, SSgt, GySgt, MSgt, 1stLt, Capt, Maj

INITIAL TRAINING SETTING: FORMAL

CONDITION: Reference the MAWTS-1 Course Catalog.

STANDARD: Reference the MAWTS-1 Course Catalog for detailed WTI POI.

PERFORMANCE STEPS: Reference the MAWTS-1 Course Catalog for individual event requirements.

REFERENCES:
1. MAWTS-1 Course Catalog

ADMINISTRATIVE INSTRUCTIONS:
All Prospective WTIs (PWTIs) will complete the WTI preparation package, as prescribed by MAWTS-1, and undergo a command screening process to ensure all PWTI nominations are of the highest caliber and adequately prepared for the rigors of the WTI course.
Upon return to their unit, WTI graduates will be employed primarily as training program managers and instructors, in accordance with command requirements.

RESOURCES: Reference the MAWTS-1 Course Catalog.

OTHER SUPPORT REQUIREMENTS: Reference the MAWTS-1 Course Catalog.

RANGE/TRAINING AREA: Reference the MAWTS-1 Course Catalog.

EQUIPMENT: Reference the MAWTS-1 Course Catalog.

BILLETS: MEU ACE Intelligence Chief, MEU ACE Intelligence OIC, WISC Training Chief, WISC Training Officer, WISC Operations Chief, WISC Operations Officer, WISC Detachment Chief, WISC Detachment OIC, Assistant ACI Officer, Assistant ACI Chief, Intelligence Analysis Officer, Chief Analyst, Target Intelligence Officer, Intelligence Plans Officer, Intelligence Plans Chief.

Figure 24. Recommended Intelligence WTI T&R Event.

While MAWTS-1 identifies pre-requisite qualifications to attend the WTI course for pilot PWTIs (though the T&R manual does not), it is less necessary to formally screen these candidates because they are so essential to the operation of the squadron and the execution of the

ACAD-6110	3.0	*	B	E	G

Tiltrotor Aircraft Commander Oral Examination

Goal. Conduct a Tiltrotor Aircraft Commander Oral Examination.

Requirement. Squadrons shall evaluate pilots for the TAC designation per the criteria in the MV-22 NATOPS Flight Manual, CNAF-M3710.7, and local SOPs. The composition and conduct of the board is to be determined by the squadron standardization board and Commanding Officer. It is recommended to provide the PUI a single ship mission representative of the current or anticipated deployment. Additive conditions and mission changes will be discussed during the oral board. The PUI will be evaluated on his knowledge, planning, and decision making logic.

Discuss

Mission Planning
Joint Mission Planning Software.
Load Computation & Take-off and Landing Data.
Flight Plan.

NATOPS

CNAF-M3710.7.
Systems & limitations.
Emergency Procedures.
Local Standard Operating Procedures.

Maintenance

COMNAVAIRFOR 4790.
Aircraft Discrepancy Book (ADB).
Maintenance Action Forms (MAF).
Troubleshooting Procedures.
Quality Assurance (QA).
Safe for Flight (SFF).
Mission Essential Subsystems Matrix (MESM).

Tactics

AFTTP 3-1.
Low Altitude Tactics.
Ground Threat Reaction.
Aircraft Survivability Equipment.
Objective Area Mechanics.
Fire Support.
Escort considerations.
Communications.

Operational Risk Management

Deliberate Risk Management.
Time Critical Risk Management.
Decision Making.
Headwork.
Maturity.

Instructor. NI/ANI, WTI, other senior pilot designated by the Commanding Officer.

Prerequisites. Recommendation by Squadron Standardization Board, Core Skill Complete.

Figure 25. Tiltrotor Aircraft Commander T&R Event. Commandant of the Marine Corps, NAVMC 3500.11E MV-22B Training and Readiness Manual, Enclosure (1), 2-184.

WTTP that squadrons are incentivized only to send the most qualified aviators and aircrew (itself a form of screening). With the establishment of T&R completion as a DRRS-reportable requirement for WISCs and the responsibility of the 0277 in managing this training program (both in the day-to-day mechanics of its management and in the necessity for 0277s to train subordinate instructors), the WISCs will have a similar incentive-alignment to ensure only the most qualified air intelligence Marines are sent. Nonetheless, as this process matures, rigorous screening of PWTIs will be essential to creating a positive feedback loop (and thus achieving progress within the CMM). As this screening becomes less necessary, such a screening T&R event can be removed (or perhaps shifted to other key roles in air intelligence such as for the subordinate instructor or for DST leadership positions).

APPENDIX H

CERTIFICATION EVENTS

Certification events should evaluate an intelligence section on its ability to effectively execute the intelligence processes as a collective element in order to provide support to the designated supported unit. All skill requirements for individuals should be codified within individual qualification events (as chained events), leaving certification events only to evaluate whether the section is effective at operating in a collective environment and executing their respective individual skills in a synchronized and integrated fashion to result in effective intelligence support to the unit they are designated to support.

These events should evaluate an intelligence element's ability to ingest or request the appropriate inputs, conduct the necessary processes, and provide the identified outputs (this also enables a single squadron DST certification event for all TMSs where the differentiation in processes exists in the 2000-level individual skills demonstrated to support squadron planning, briefing, execution, and debriefing). In this way a certification event for a squadron DST can be conducted in isolation from or integrated with the squadron it supports (providing flexibility to intelligence units by avoiding a dependency on operations training). In the same way, an ACI section may be certified in isolation from the entire ACI, if necessary.

While certification events may take place separate from an aviation unit (i.e., in a simulated environment) or in support of an actual unit (i.e., during an exercise or other training event), no training scenario will be able to fully replicate the fog of war and complexities of real-world operations. Therefore, a critical element of all of these events must be a degree of *adaptation* and the evaluation of critical thinking and creative problem-solving. A certification event should not just exercise a section's ability to do its job when given all the tools, but it should also exercise a section's ability to do its job when given the 'wrong tool,' a 'broken tool,' or when missing a 'tool' entirely. For example, it is not enough to be given coordinates, retrieve and evaluate imagery, conduct an HLZ study, and present it to aviation planners. A section must occasionally be given the wrong coordinates and determine that it is not likely the aviators intended on landing on the slope of a steep mountain. The evaluation in this case should be whether the section returns to the 'operations planner' who provided the incorrect coordinates and re-validates them.

This realism variable also presents an opportunity to integrate lessons learned from previous operational experience. The 'curve balls' experienced in real life can be integrated into future certification exercises. As sections develop ways to deal with these, they can be incorporated into SOPs or even doctrine, layering another degree of learning into the process, facilitating progress along the CMM.

APPENDIX I

CORE MODEL MINIMUM REQUIREMENTS FOR AIR INTELLIGENCE

An air intelligence CMMR is essential for three primary reasons: the syllabus concept in Appendix C relies on it to identify the individuals to be trained as well as the events to be trained to; the mapping of BICs back into supported units to support Force Deployment Planning and Execution (FDP&E—see Appendix N) requires these BICs to be identified with the fidelity of number, rank, and MOS; and readiness metrics (whether in the form of DRRS for the WISC or in the form of an FA 250 checklist for all units) rely on an identified list of what positions are required in specific training requirements. Any improvement of the T&R manual without an articulation of some form of CMMR that at least identifies (by billet) the number, rank, MOS of Marine and specific T&R events required for each billet, merely makes the T&R manual an optional menu of training with no accountability mechanism or tool by which to map training events to Marines who need to be trained. While this describes the current state of the Intelligence T&R Manual, it is counter to its design.

The syllabus concept in Appendix C relies upon both an individual's completion of requisite qualification syllabi and the collective DST's completion of the requisite certification event. Thus, to fully implement this framework, the Intelligence T&R Manual requires a CMMR-like definition of normal DST compositions for each ACE echelon. Such a CMMR would define the normal 'crew positions' to support a given ACE and the threat, operational-support, and instructor qualifications associated with each crew position.

Stated another way: it is meaningless to articulate qualifications without tying those qualifications to a billet and it is meaningless to certify an individual or group as ready and trained without identifying the specific training requirements that are being certified.

Unfortunately, this ‘meaninglessness’ is the current state of air intelligence training where, beyond formal courses, no institutionally-recognized training (formal or informal) exists, and where there is no differentiation of training requirements between an 0207 filling a squadron intelligence officer billet, a BDA Officer billet, or an 0207 billet in an Intelligence Battalion unrelated to air intelligence.

As Appendix N describes, it will also be essential to map BICs back into ACE units for FDP&E purposes. To state the obvious, for billets to be mapped back into the supported unit T/O&E, those billets must be identified, at least to the detail of rank and MOS. From the perspective of training readiness, the additional detail of individual qualifications and element certifications must also be identified for any training plan to be developed, implemented, and evaluated. This is the definition of a CMMR.

And finally, any evaluation intended to measure T&R completion must measure that completion against a standard. As the WISC is not intended to deploy as a unit (but to provide DSTs) and as the residual MAG and MAW intelligence sections are intended to be augmented with WISC DSTs when deployed, the T&R manual must specify the composition of that DST as well as the training requirements it must achieve. Without this, there is no metric to differentiate the training level of a group of Marines fresh from entry-level training from the training of a veteran DST. While rank might serve as a proxy for such skill differentiation in other fields, air intelligence is not defined by PMOS. In this way, a corporal with two years of air intelligence experience may be a more capable air intelligence Marine than a newly-arrived sergeant who just graduated from SITCC.

Thus, to implement DRRS training metrics derived from DST generation requirements there must be some articulation of personnel and skills for the DSTs called for by the supported

MAW’s TEEP. And to inspect the intelligence training level of a unit by a readiness inspection FA 250 checklist (which is generic to all intelligence areas), it must evaluate the air intelligence section’s training against a specific air intelligence standard. Without a CMMR that provides this DST-specific standard, both of these inspection mechanisms can be met so long as all Marines conduct sustainment training only on their entry-level events. This is both the current state and undesirable.

This measurement has a second and significant impact: the objective measurement of risk or the ability to identify appropriate risk mitigation. Currently, if an air intelligence section faces the prospect of deploying with three instead of four Marines, there is no way to present the loss of capability or capacity to the commander in a way that clearly articulates the risk. Indeed, because squadron and MAG T/Os have not changed significantly since the 1980s, maintaining three Marines still represents 50% more than the two intelligence BICs on the T/O. A CMMR, matched to the sortie generation rates of a squadron, presents something of a ‘math equation’ that states: ‘it takes four intelligence Marines to support a sustained sortie generation rate of sixteen; by reducing the intelligence shop to three, the squadron accepts the risk of inadequate intelligence support to approximately four sorties a day.’

The training elements of a CMMR help identify if the issue is capacity (as in the case of a single-TMS squadron) or capability (as might be the case for a composite squadron, where the lost analyst is trained in a specific set of skills). This better enables the commander to evaluate risk. If the squadron’s mission is likely to result in longer flights (each counting as multiple sorties) or if the mission is focused on alert lines (where few operational sorties are launched and, when they are, the S-2 section can surge capacity to support), then perhaps a capacity risk can be accepted. If the issue is capability risk, perhaps the risk can be mitigated through crosstraining (i.e., if an analyst trained to support AV-8Bs and AH-1s is lost, an analyst trained to support assault support platforms can be cross-trained to fill this gap).

Some will and have objected to the articulation of a CMMR as overly prescriptive and a peculiar artifact of Marine aviation. However, a CMMR is not as foreign a concept to non-aviation communities as it may at first seem. And, if its function is properly understood, it is an *essential* prerequisite for OTE at any level and in any capacity. Stated another way: by failing to articulate a CMMR, it is *not possible* to ensure sections are adequately organized, trained, and equipped—the best that can be hoped for is an assessment that an intelligence section *seems* ready based on a purely subjective evaluation.

A CMMR, then, is simply a deliberate troop-to-task articulation conducted for the purposes of training, equipping, and attaching an intelligence element. In this sense, it is the most basic obligation of any OIC or chief at any level.

Furthermore, CMMRs are everywhere in the Marines Corps, though they are not always recognized as such. For example, every T/O is a partial CMMR, the staffing of which marks a level of personnel readiness.

A more complete example can be found in the Marine rifle squad. Service doctrine describes a rifle squad's composition and the duties of each position (see Figure 26) in what is essentially a squad CMMR. This, when combined with the *MCWP 3-11.1 Infantry Company Operations* and its organization of companies and platoons, as well as the descriptions of each position's duties, provides a CMMR for an infantry company. This is further augmented by the Infantry T&R Manual's billet descriptions and core capabilities for each 0302 (infantry officer) and 0369 (infantry unit leader) billet.[522]

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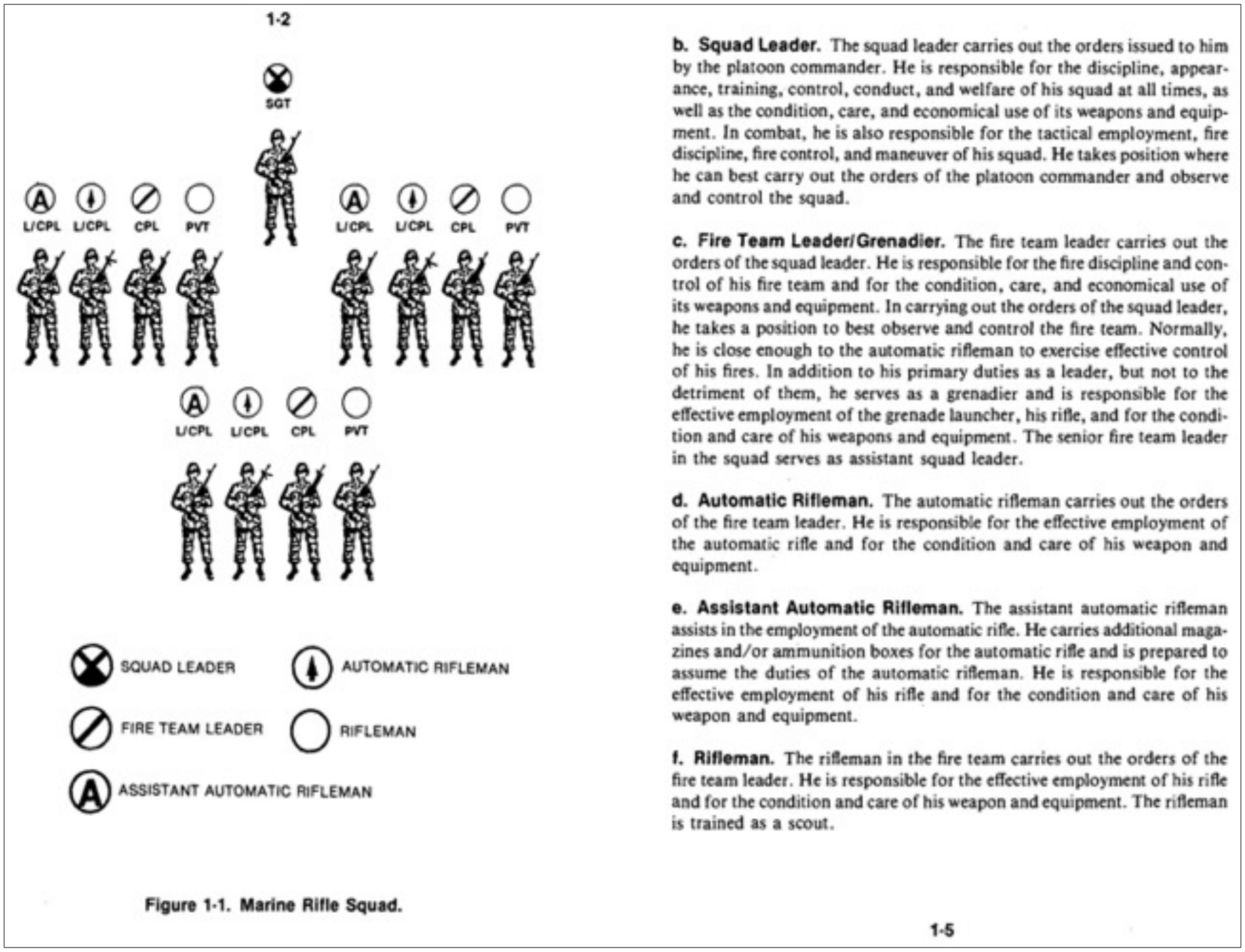
[522] Commandant of the Marine Corps, *NAVMC 3500.44C Infantry Training and Readiness Manual* (Washington, D.C.: Headquarters, United States Marine Corps, November 4, 2016), Enclosure (1), 9-3 - 9-26.

Within Marine air intelligence, MCRP 3-20F.2's Manning Requirements Annex (Annex A) acts like a CMMR for the TACC.



b. Squad Leader. The squad leader carries out the orders issued to him by the platoon commander. He is responsible for the discipline, appearance, training, control, conduct, and welfare of his squad at all times, as well as the condition, care, and economical use of its weapons and equipment. In combat, he is also responsible for the tactical employment, fire discipline, fire control, and maneuver of his squad. He takes position where he can best carry out the orders of the platoon commander and observe and control the squad.

c. Fire Team Leader/Grenadier. The fire team leader carries out the orders of the squad leader. He is responsible for the fire discipline and control of his fire team and for the condition, care, and economical use of its weapons and equipment. In carrying out the orders of the squad leader, he takes a position to best observe and control the fire team. Normally, he is close enough to the automatic rifleman to exercise effective control of his fires. In addition to his primary duties as a leader, but not to the detriment of them, he serves as a grenadier and is responsible for the effective employment of the grenade launcher, his rifle, and for the condition and care of his weapons and equipment. The senior fire team leader in the squad serves as assistant squad leader.

d. Automatic Rifleman. The automatic rifleman carries out the orders of the fire team leader. He is responsible for the effective employment of the automatic rifle and for the condition and care of his weapon and equipment.

e. Assistant Automatic Rifleman. The assistant automatic rifleman assists in the employment of the automatic rifle. He carries additional magazines and/or ammunition boxes for the automatic rifle and is prepared to assume the duties of the automatic rifleman. He is responsible for the effective employment of his rifle and for the condition and care of his weapon and equipment.

f. Rifleman. The rifleman in the fire team carries out the orders of the fire team leader. He is responsible for the effective employment of his rifle and for the condition and care of his weapon and equipment. The rifleman is trained as a scout.

1-5

Figure 26. Marine Rifle Squad CMMR. Headquarters, United States Marine Corps, MCWP 3-11.2 w/Ch 1 Marine Rifle Squad, 1-2, 1-5.

Nor is a CMMR prescriptive. It is only a description of normal or standard operations. Despite a CMMR for a VMM prescribing four crew positions, sorties are often sent out with three or five crewmembers, depending on specific mission requirements. Additionally, the flexibility provided to commanders in DRRS (if a component of readiness reporting is based on ability to meet a CMMR) allows them to factor in any constraints that require deviation from normal or standard operations, whether abnormal manpower shortages or a TEEP that requires non-standard support elements.

A common objection to the idea of a CMMR is the notion that intelligence capacity and capability cannot be in any way quantified. Certainly, in some areas this is true. It is not possible to determine how many Marines are required to find an elusive high-value individual nor how long they will need. However, the military finds ways to quantify any number of things as general planning factors. Ground units have a doctrinal frontage sizes, standard rates of march, standard load outs, and standard quantities for days of supply of food or fuel. There are calculations for how quickly an infantry platoon can move on foot, how much the addition of more weight will slow them down, or how many hours it takes two Marines to dig a standard fighting hole.

In a similar fashion, intelligence can quantify certain outputs that are useful as planning factors, if not precise expectations in combat. Given sufficient resources and access to the appropriate databases, it should be possible to determine the minimum acceptable standard for a group of Marines of a certain rank and MOS composition and certain level of training to produce an IPB for a certain size AO or for a certain size enemy unit. Similarly, it should be possible to determine how long it takes an 0241 to create an HLZ study.

Such standards can be established inductively, just as first-class fitness test scores are—by gathering a sufficient sample size and analyzing the distribution of outputs. Given ten groups of similarly-trained and -experienced Marines, producing ten IPBs on a standard Russian Missile Defense Brigade, perhaps the second-slowest group is established as the standard minimum time required and adjustments are made from there. Or a reasonable standard for VMFA DST size and training level might be selected and then refined based on detailed feedback from deployments.

A CMMR, then, is no more than a description of what a normal planning factor (in terms of composition and qualifications) is for a unit of employment. For infantry companies, this is the company and its platoons and squads. This is why an infantry companies' personnel readiness is measured against the staffing of their T/O (which is the 'CMMR' described in doctrine). For a VMM, this is the ability to generate the requisite number of crews required by the MV-22B T&R Manual. In both cases, the specific employment and deployment of a unit may require a different force. A deployment may call for a reinforced infantry company or a '0.5 VMM' (i.e., six instead of twelve aircraft). But in both cases, readiness, as a standardized measurement, is measured against standard employment until a specific mission requirement is levied on the unit.

The need for a CMMR can also be determined by analyzing the alternative (i.e., the current state). If the T&R manual does not articulate the size, composition, and training requirements for a given unit of employment (e.g., Squadron S-2/DST), then there is no justification to conduct any training beyond sustainment of entry-level T&R events. This is clearly undesirable. If the requirement articulated is only by T/O, then any Marine of the prescribed rank and MOS is equally capable of meeting the minimum requirement as any other. This is obviously not true. If the requirement articulated is only by training (i.e., a T&R manual that attaches events to supported unit/MET but not billets), then a single trained Marine potentially meets the minimum standard for what should be an entire DST. This is obviously not true, either. And, finally, a requirement that articulates both T/O and collective training requirements but that does not map one to the other results in an identical situation. The only option that remains is linking specific billets to specific individual and collective training requirements. This is a CMMR.

There is therefore nothing special, unique, or peculiar about articulating a CMMR for air intelligence. The WISC's primary unit of employment is the DST to support ACE units (for F-35 and VMU squadrons, it is their T/O S-2 section; for MAGs and MAWs, it is their T/O S-2 section as augmented by the WISC DSTs). And the ACE has standard formations. Thus, if the WISC's CMMR articulates the composition (i.e., crew positions) and qualifications (i.e., training requirements) of a DST that corresponds to every standard ACE formation, the MAW TEEP (which articulates the ACE formations the MAW is required to deploy in support of operational requirements) can be used to identify what the supporting WISC's corresponding DST generation requirements are.

Each standard DST would correspond to an output standard, derived from the supported unit MET output standards for each standard ACE formation. For example, if a VMM must be able to generate sixteen sorties to support its ten Core and Core Plus METs, the corresponding DST would have to be able to provide intelligence support to sixteen sorties (which would inform the capacity—or composition—of the DST) for any of the ten METs (which would inform the capability—or training requirements—of the DST).

The standard ACE formations are:

- HMLA (Core and Core Plus)
- HMH (Core and Core Plus)
- VMA (Core and Core Plus)
- VMM (Core and Core Plus)
- VMGR (Core and Core Plus)
- VMFA (FA-18) (Core and Core Plus)
- VMFA (F-35) (Core and Core Plus)
- VMU (Core and Core Plus)
- MEU ACE (this encompasses a VMM with HMLA, HMH, and VMA or VMFA detachments)
- Fixed-Wing MAG
- Rotary-Wing MAG
- MEB ACE (small, medium, and large)
- MAW

A CMMR developed for these standard ACE formations enables tailored DSTs to be generated for non-standard ACE formations as well. For example, if a MAW is required to deploy a 0.5 VMM, the operations officers of the MAW and/or VMM and its supporting WISC can conduct the appropriate mission analysis to determine the output standard required of the ACE deployment, any other relevant parameters, and adjust a standard DST accordingly. If the 0.5 VMM, then, is only required to generate eight sorties for a twelve-hour flight window, the corresponding DST may be as small as one chief and one analyst with the appropriate VMM-support qualifications. If the 0.5 VMM is required to generate eight sorties during a twenty-four-hour flight window (or from two separate sites), the DST may be as large as one OIC, one chief, and two analysts (providing a leader and analyst for each shift or at each site).

This research recommends a baseline single-TMS squadron DST as four Marines, one leadership position (chief or OIC) and one analyst each for two twelve-hour shifts, able to support twenty-four-hour operations or more limited operations from two sites. This allows the S-2 flexibility to simultaneously provide intelligence support to planning, briefing, execution/in-flight support, and the requisite intelligence PED to support organic collections (to include debriefing and exploitation of weapon system video or handheld photography) across a twenty-four-hour flight (or alert) window. This also allows the S-2 to shoulder the inevitable collateral responsibilities placed on squadron sections (e.g., entry control point or mess hall duty) that might otherwise significantly impact the section's ability to provide mission support.

However, as tempting as it is to look upon squadrons, all existing at the same echelon (i.e., a battalion equivalent), as identical in their intelligence support requirements, they are quite different in a number of key attributes relevant to intelligence support. Thus, this baseline of four

Marines must be adjusted according to sortie generation capabilities, collection capabilities (and therefore PED requirements), and supported METs.

Table 12 depicts each squadron's sortie generation rate, Core and Core Plus METs, and (using the recommendations in Appendix F) the intelligence qualifications that support the METs.

Table 12. Sorties, METs, and Intelligence Qualifications by Squadron

	HMH		**HMLA**		**VMA**		**VMFA (FA-18)**		**VMFA (F-35)**		**VMGR (KC-130J)**		**VMM**		**VMU**		**MEU ACE**
	Core	**Core Plus**	**Core**	**Core Plus**	**Core**	**Core Plus**	**Core**	**Core Plus**	**Core**	**Core Plus**	**Core**	**Core Plus**	**Core**	**Core Plus**	**Core**	**Core Plus**	**Core**
Sorties	21		36		20		20		24		20		16		12		39[523]
METs	5	8	12	17	5	11	8	13	11	16	5	8	5	10	5	8	27[524]
Intelligence Qualifications	3	3	5	6	2	4	3	4	5	6	2	4	3	4	4	6	9
Intelligence Support Factor[525]	63	63	180	216	40	80	60	80	120	144	40	80	48	64	48	72	351

While not a rigorous scientific methodology, the Intelligence Support Factor indicated on Table 12 derives from the simple multiplication of sustained sortie generation rate by the operational-support intelligence qualification derived in Appendix F, providing a gross proxy for capability and capacity required to support the indicated squadron. From my anecdotal

[523] This figure is based off of the aggregated maximum daily sorties of elements of comparable size for a normal MEU ACE: four CH-53Es (five sorties), four AH-1Zs (four sorties), three UH-1Ys (four sorties), six AV-8Bs or six F-35Bs (eight sorties), twelve MV-22Bs (sixteen sorties), and five RQ-21s (two sorties). Sortie generation and detachment size numbers are not available in the RQ-21 TACNOTE (which serves as the community's T&R manual at present). The figures included were provided from the MAWTS-1 UAS Division.

[524] A MEU ACE's METs are abstracted one level from single-TMS squadrons [i.e., instead of multiple discrete assault support MCTs, they are contained in a single MCT 1.3.4 Conduct Assault Support]. Thus, strictly using the methodology applied to other ACE elements, the MEU ACE has only nine METs. However, this is clearly not consistent with the information in this table for any other ACE element. Thus, the twenty-seen MEU ACE METs indicated are carried over from the TMSs that comprise an F-35 MEU ACE and replace the formally-assigned one-level abstracted METs.

[525] This number simply multiplies the maximum sustained daily sorties for an ACE element by the number of intelligence qualifications necessary to support the ACE element, according to Appendix F.

experience, a VMGR assigned Core METs requires as few as three intelligence Marines, a VMM assigned Core Plus METs requires four, and an F-35 MEU ACE requires approximately eleven. A simple linear best-fit for these anecdotal numbers (with Intelligence Support Factor as the independent variable) indicates a baseline shop of approximately 2.2 Marines with an additional Marine for every forty Intelligence Support Factor points (i.e., Number of Marines = 0.0252*Intelligence Support Factor + 2.1836). While not intended to be a prescriptive capacity equation and a calculation that does not take into account rank, MOS, or training level, this at least provides a way to begin articulating differences in intelligence support required by different squadrons based on the METs assigned and sortie generation rate. The point is ultimately that there is an order of magnitude difference in the Intelligence Support Factor of the smallest requirement (forty) and the largest (351) and that this should translate into variable DST sizes.

Beyond demonstrating variance in capacity requirements, recommendations about the specific size of DSTs is beyond the scope of this research. This research only concludes that such a size determination should be made and codified in an air intelligence CMMR.

Fortunately, the ACI presents less of a challenge.

Table 3 depicts the ACI staffing prescribed by *MCWP 3-20F.2 Marine Tactical Air Command Center Handbook* (which has remained unchanged since 1998). Table 13 updates this T/O by:

- removing the TERPES detachment (this section supported VMAQs, which are now deactivated)
- replacing 0231s with 0271s, adding in 0277s where appropriate (using the recommendations in Appendix L for using 0277s primarily for training program management, instruction, and the highest degree of training and execution quality control available in the OPFOR)
- correcting a number of errors (indicated by footnotes in Table 3)
- adding the intelligence embeds into the Current Operations, Future Operations, and Plans sections of the TACC (in MCRP 3-20F.2 these are included in the manning tables for the

corresponding sections, not the ACI; Table 13 adds an intelligence plans section in Future Plans and also adjusts the recommended ranks for embedded billets).

As discussed in Appendix C, this T/O must be updated further, still, recognizing new capabilities and requirements to conduct operations in the information environment and integrate cyberspace operations.

Table 13. Recommended ACI Staffing

Section / Billet Description	Rank	BMOS	Number
Air Combat Intelligence			
ACI Officer	Lieutenant Colonel	0202	1
Assistant ACI Officer	Major	0277	1
ACI Chief	Master Sergeant	0271	1
Assistant ACI Chief	Gunnery Sergeant	0277	1
ACI Operations Assistant	Sergeant	0271	1
ACI Operations Assistant	Corporal	0271	1
Intelligence Analysis Section			
Intelligence Analysis Officer	Captain	0277	1
Assistant Intelligence Analysis Officer	Captain	0202	1
All Source Intelligence Cell			
Senior Analyst	Lieutenant	0207	2
Chief Analyst	Gunnery Sergeant	0277	2
Intelligence Analyst	Staff Sergeant	0271	2
Intelligence Analyst	Sergeant	0271	2
Order of Battle Cell			
Order of Battle Analyst	Sergeant	0271	2
Order of Battle Analyst	Corporal	0271	2
Imagery Analysis Cell			
Imagery Interpreter	Gunnery Sergeant	0241	1
Imagery Interpreter	Staff Sergeant	0241	2
SIGINT Section			
SIGINT Officer	Lieutenant	0206	1
SIGINT Chief	Staff Sergeant	2621	1
SIGINT Support Clerk	Staff Sergeant	2621	2
SIGINT Analyst	Corporal	0271	1
Collections Section			
Collections Officer	Captain	0202	1
Assistant Collection Officer	Lieutenant	0207	1
Collection Chief	Gunnery Sergeant	0271	2
Collection Clerk	Sergeant	0271	2
Targeting Intelligence Section			

Section / Billet Description	Rank	BMOS	Number
Target Intelligence Officer	Captain	0277	1
Assistant Target Intelligence Officer	Lieutenant	0207	1
Target Intelligence Chief	Gunnery Sergeant	0277	1
Target Development Cell			
Target Development Officer	Lieutenant	0207	2
Target Analyst	Staff Sergeant	0271	2
Target Analyst	Sergeant	0271	2
Target Validation Cell			
Target Validation Officer	Lieutenant	0207	2
Target Analyst	Staff Sergeant	0271	2
Target Analyst	Sergeant	0271	2
Battle Damage Assessment Cell			
BDA Officer	Lieutenant	0207	2
BDA Analyst	Sergeant	0271	2
BDA Analyst	Corporal	0271	2
Intelligence Plans Section			
Intelligence Plans Officer	Major	0277	1
Intelligence Plans Chief	Gunnery Sergeant	0277	1
Intelligence Plans Analyst	Sergeant	0271	1
Requirements and Dissemination Section			
Research and Development Officer	Captain	0202	1
Assistant Research and Development Officer	Lieutenant	0207	1
Research and Development Clerk	Staff Sergeant	0271	2
Research and Development Clerk	Corporal	0271	2
Intelligence Systems Section			
Systems Officer	Lieutenant	0207	1
Systems Chief	Staff Sergeant	0271	1
Weather Section			
Weather Officer	CWO	6802	1
Weather Forecaster	Staff Sergeant	6842	1
Weather Forecaster	Sergeant	6842	1
Weather Observer	Sergeant	6821	1
Weather Observer	Corporal	6821	1
Radio Battalion Detachment			
Detachment Commander	Captain	0206	1
ELINT Chief	Staff Sergeant	2631	1
ELINT Analyst	Sergeant	2631	2
SIGINT Analyst	Sergeant	2629	2
SCI Communications Officer	Corporal	2651	1
Current Operations Intelligence Watch Section			
Intelligence Watch Officer	Lieutenant	0207	2

Section / Billet Description	Rank	BMOS	Number
Intelligence Watch Chief	Staff Sergeant	0271	2
Intelligence Watch Analyst	Corporal	0271	2
ELINT Watch Analyst	Corporal	2631	2
Future Operations Intelligence Watch Section			
Intelligence Watch Officer	Captain	0202	2
Intelligence Watch Analyst	Sergeant	0271	2
Future Plans Intelligence Plans Section			
Intelligence Plans Officer	Major	0202	1
Intelligence Plans Chief	Gunnery Sergeant	0271	1
Intelligence Plans Analyst	Sergeant	0271	1
	Officers	**28**	
	Enlisted	**65**	

The ACI headquarters section and each subordinate section and cell would have each billet associated with the operational support T&R event corresponding to the rank/MOS in the billet (see Appendix F).

As discussed in Appendix C, MAGs present a peculiar requirement, necessitating a scaled-down ACI when the MAW is not present or the partial absorption of squadron capability and capacity when a MAW is present. In the first case, the ACI CMMR (Table 11, combined with Table 13) should be scaled down to a 'MEB ACI' in small, medium, and heavy variants (corresponding to the low-, medium-, and high-intensity conflict configurations of a MEB).[526] In the second case, a MAG CMMR should include a small headquarters element with portions of subordinate squadron DSTs mapped into it. In this way, the CONOPS development capacity and capability normally resident in squadron DSTs can be mapped into this MAG DST, leaving

[526] A low-intensity MEB ACE consists of a KC-130 detachment (two aircraft), a VMFA (F-35) squadron (sixteen aircraft), two VMM squadrons (twenty-four aircraft), an HMLA detachment (five AH-1Zs and four UH-1Ys), and an HMH detachment (eight aircraft). A medium-intensity MEB ACE consists of a KC-130 detachment (two aircraft), three VMFA (F-35) squadron (forty-eight aircraft), four VMM squadrons (forty-eight aircraft), an HMLA detachment (ten AH-1Zs and eight UH-1Ys), and a reinforced HMH squadron (twenty-four aircraft), and a VMU detachment (nine RQ-21s). A high-intensity MEB ACE consists of a KC-130 detachment (two aircraft), two VMFA (F-35) squadron (thirty-two aircraft), four VMM squadrons (forty-eight aircraft), an HMLA squadron (fifteen AH-1Zs and twelve UH-1Ys), an HMH squadron (sixteen aircraft), and a VMU detachment (twelve RQ-21s). Marine Corps Combat Development Command, *Expeditionary Force 21: Marine Expeditionary Brigade Informational Overview* (Washington, D.C: Headquarters, United States Marine Corps, September 16, 2014), 24-29.

sufficiently capability and capacity at the squadrons to conduct the briefing and debriefing responsibilities articulated in the tentative air intelligence concept (Appendix C). Likely, this would look like a chief and an analyst remaining at the squadron and the OIC and an analyst being absorbed into the MAG. This builds in a capacity flexibility that scales with the number of supported squadrons.

Any CMMR should include equipment needs (i.e., programs of record) as well. While specific recommendations for these CMMRs for both personnel and equipment is beyond the scope of this research, it is worth making one note for consideration when equipment requirements are developed. Because a CMMR articulates a capacity and capability and because capability is provided in part by equipment, consideration should be given to the fact that some programs of record have equipment set ratios that must be met to receive certain pieces of gear. For example, one printer is provided for every four Intelligence Workstations. This means that a CMMR of a three-Marine element will not be provisioned with a printer. If it is determined that this capability is necessary in an intelligence DST, the WISC must have sufficient printers to provision the DST with a printer outside of this program of record equipment ratio or it must ensure the CMMR is four Marines to ensure the necessary printer is already part of the DST structure on the T/O&E.

These CMMRs will have significant consequences for the T/O of the WISC (significantly changing the organization of BICs, though not the mix of BICs themselves). At present, WISCs will be organized according to rotary-wing, fixed-wing, and ACI platoons. Such organizational structures, which simply pool BICs within them, have no bearing on any model of training or employment of Marines in the WISC and therefore should be abandoned and replaced with the developed CMMR structure. This is necessitated by the BIC mapping recommended in

Appendix N and brings the organization of WISC T/Os in line with their actual employment in practice. As an added benefit, organization along DSTs also helps address the equipment set problem.

APPENDIX J

UNIFICATION AIR INTELLIGENCE POST-WISC

The primary purpose of re-structuring large portions of air intelligence billets into WISCs is to achieve conditions that enable more robust training and specialized preparation of DSTs that will attach to supported ACE units. The consequence implied by this is that air intelligence Marines in force structures outside of the WISC will be, to a certain degree, left behind.

It is not clear that this is a sustainable approach.

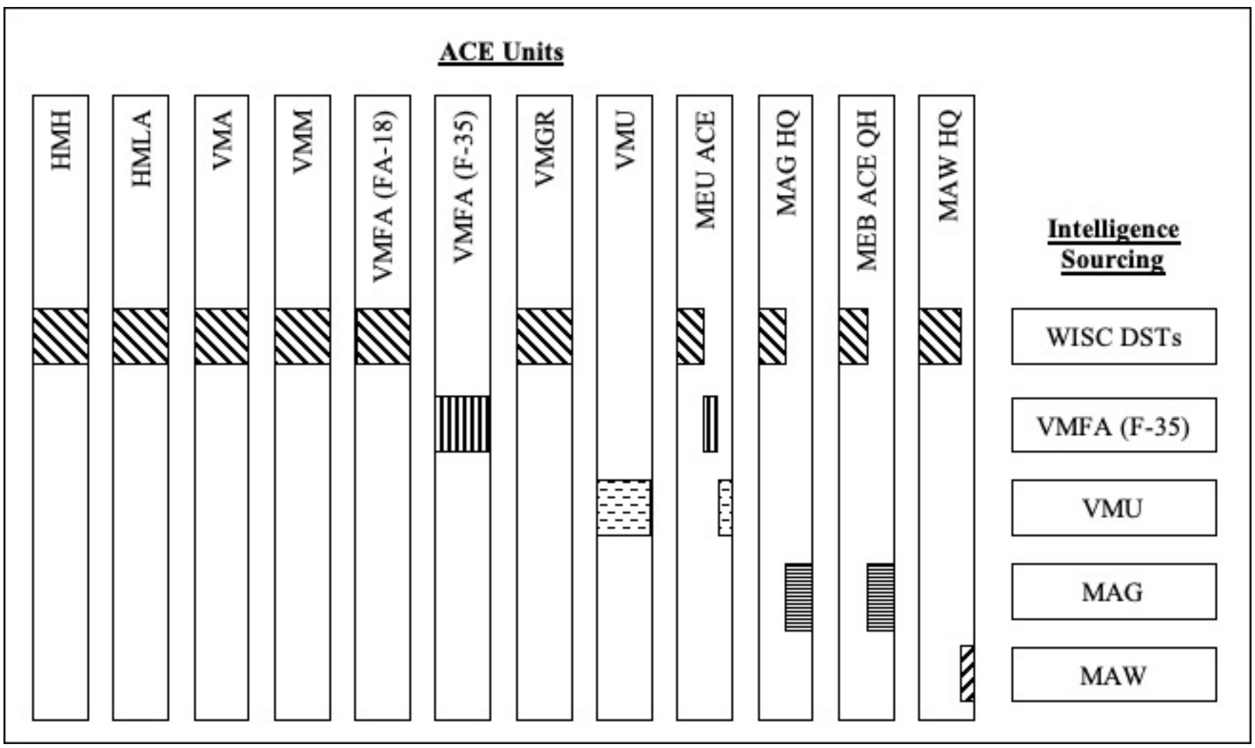


Figure 27. Bifurcation of Deployed ACE Unit Intelligence Sourcing

Marine aviation is broadly a community defined by MOS—providing its members a career path that generally keeps them within this community over their career—and relatively MOS-dense units, with aviators and aircrew for a certain platform concentrated in OPFOR units rather than diffused across the enterprise. This characteristic contributes to the ability to institute process improvements and achieve a learning and optimizing organization overall. This is not a characteristic shared by the air intelligence community. And any efforts to improve the entire community will have to mitigate this differential.

The force structure 'orphaned' by the WISC has two elements: the squadrons maintaining residual intelligence structure (F-35 VMFAs and VMUs) and the residual intelligence structure at headquarters units (MAGs and MAWs). Figure 27 depicts how this bifurcation of the WISC results in a mismatch of intelligence sourcing for some deployed ACE units. This bifurcation presents an obstacle to effective training because the Marines that will support certain elements will not necessarily be able to train together.

The intelligence structure of F-35 VMFAs presents the most obvious challenge to the WISC idea. Because of the advanced capabilities and systems of the platform, F-35 VMFAs require more robust intelligence and security management support than other squadrons. The current solution to this problem has been to maintain an organic intelligence section.

According to the 2019 Marine Corps Aviation Plan, by FY2029, all active-duty VMAs and FA-18 VMFAs will have converted or stood down to begin conversion to F-35 VMFAs, marking the end of WISC VMA and FA-18 VMFA support.[527] The result for the WISCs will be that one WISC detachment on each coast (MCAS Yuma on the West Coast, under 3d WISC, and MCAS Beaufort on the East Coast, under 2d WISC) will be at an air station where the only element to potentially require WISC DST support with be a MAG headquarters, with all tenant squadrons being F-35 VMFAs (with the addition of a VMU in Yuma). And a second WISC detachment on each coast (MCAS Miramar for 3d WISC and MCAS Cherry Point for 2d WISC) will have significantly reduced WISC DST support requirements: MCAS Cherry Point with a MAW headquarters, MAG headquarters, and single VMGR squadron; MCAS Miramar with a

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[527] Headquarters, United States Marine Corps, Department of Aviation, *2019 Aviation Plan* (Washington, D.C: Headquarters, United States Marine Corps, Department of Aviation, March 25, 2019), 39.

MAW headquarters, two MAG headquarters, three HMH squadrons (with a fourth having transitioned to a non-operational training squadron in FY2021), and five VMM squadrons.

The transition from FA-18s and AV-8Bs (requiring WISC DST support) to F-35s calls into question the size of the WISC detachments at these air stations (where all or a significant proportion of aviation commands will not require WISC support). And with a component of WISC training incorporating integration with squadron training plans (to provide intelligence Marines experience mission planning, briefing, supporting execution, and debriefing with aviators and aircrew during garrison training), the conversion of most, if not all, tenant squadrons to those with organic S-2s will deny this integration opportunity to WISC Marines. This is before even considering the controlled access programs associated with the F-35 which will likely place WISC Marines in the position where they lack the requisite accesses (or justifications to receive such accesses) to fully integrate with training even if they were afforded the opportunity to do so.

Additionally, as squadrons are converted to F-35s, this will place a greater manpower burden on the pool of available air intelligence Marines, specifically for the captain intelligence officers (one for each of the eighteen active duty F-35 squadrons by FY2029). As there are already not enough intelligence lieutenants to create the necessary number of intelligence captains, it is unclear how this structure will be sustained within the 0207/0202 field. (Intelligence WTI course throughput also becomes an issue as these captains are all currently required to be 0277s.)

Because a VMU’s primary mission is to operate the sensor packages carried by its aircraft, VMUs similarly require a robust intelligence section, even for garrison training (as intelligence Marines are integral parts of the conduct of operations, even in training).

For headquarters units (MAG and MAW), the WISC is charged with providing DSTs to support the deployments of these ACE echelons by augmenting their residual organic structure.

One solution to solving the squadron component of this bifurcation is already suggested by the F-35 VMFA T/O. The organic intelligence complement of F-35 squadrons includes only three intelligence Marines—an 0202 captain (coded with a BMOS of 0202 and an ASD of 0277), an 0271 staff sergeant, and an 0271 lance corporal—joined by a 7518 first lieutenant (the MOS for an F-35 pilot).[528] The T/O also lists eight additional intelligence augments, but these billets are mapped from the parent MEF's Radio Battalion and the parent MAG.[529]

In a similar fashion, the WISC could absorb these intelligence billets (the three organic 02xx billets and the billets mapped by the MAG), map them into the F-35 squadrons, and then ensure a DST is permanently attached, rotating personnel in and out as required (i.e., without requiring Permanent Change of Assignment [PCA] orders). (Since the Radio Battalion billets would need to remain mapped to the F-35 squadron for FDP&E reasons, the WISC could arrange a memorandum of agreement whereby they remain responsible for the training of those Marines, along with the remainder of the DST.)

This would ensure that the F-35 squadrons would have full-time, dedicated intelligence staff, co-located with and under the operational control of the squadron, but the WISC would retain some degree of manpower cognizance over and training responsibility for them. This would formally expand the WISC's mission and permit the WISC to conduct the appropriate talent management to ensure the most capable intelligence Marines were available to the F-35

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[528] Headquarters, United States Marine Corps, *Fiscal Year 2025 T/O&E Report for VMFA-121*, Total Force Structure Management System. November 28, 2018. https://tfsms-cognos.mceits.usmc.mil/

[529] Assistant Chief of Staff G-2, Third Marine Aircraft Wing, *Concept of Employment For Intelligence Support to F-35B/C Operations (Version 2.2)* (Marine Corps Air Station Miramar, CA: Third Marine Aircraft Wing, December 14, 2018), 8-9.

squadrons. The WISC would assume the burden of training up these Marines and then attach them to the squadron for an extended period (twelve to eighteen months or longer as TEEP obligations dictate), recapitalizing them on the back end of their tour in order to fulfill primary training roles at the WISC detachment to train up new F-35 intelligence Marines. This would also provide F-35 squadrons with greater flexibility should one of these intelligence Marines become non-deployable. The WISC could simply rotate that Marine out with a freshly-trained Marine at the WISC detachment or conduct a swap between the deploying F-35 squadron and an F-35 squadron not scheduled to deploy soon.

This recommendation is already endorsed within a 3d MAW draft CONEMP for intelligence support to the F-35. Referring to the organically-assigned intelligence officer, all-source analysts, and the mapped billets from the MAG, it states,

> This arrangement is further aided by the establishment of Wing Intelligence Support Company (WISC) Detachments at each Marine Corps Air Station, which permits rotation and management of personnel between the WISC, Groups and Squadrons. For at least the first few years of establishing and operating F-35B/C squadrons, there should even be an informal personnel policy to routinely fill squadron-level intelligence billets through local PCA orders from among personnel already assigned to the Group or Wing (to include the WISC), and to backfill these open billets with inbound intelligence personnel.[530]

If VMUs are handled in a similar manner, this addresses the first (squadron) component of the bifurcation issue.

With respect to the headquarters bifurcation issue, the MAG offers the easiest solution, as its residual intelligence structure is small, making the scope of the supporting WISC DST clear. In FY2025, the S-2 organic to a non-F-35 MAG is seven Marines, depicted in Table 14. For F-35 MAGs, there are eight Marines (with two additional mapped BICs), depicted in Table 15.

[530] Ibid., 9.

Table 14. FY2025 T/O for a non-F-35 MAG S-2

Billet Description	Rank	BMOS ASD	PMOS
Intelligence Officer	Major	0202	0202
Intelligence Officer	Captain	0202 0277D	0202
Assistant Intelligence Officer	First Lieutenant	0207	0207
Targeting Officer	First Lieutenant	0277	0207
Intelligence Chief	Gunnery Sergeant	0239	0231
Intelligence Specialist	Sergeant	0271	0231
Intelligence Specialist	Corporal	0271	0231

Source: Headquarters, United States Marine Corps, *Fiscal Year 2025 T/O&E Report for MAG-26*.

Table 15. FY2025 T/O for an F-35 MAG S-2

Billet Description	Rank	BMOS ASD	PMOS
Intelligence Officer	Major	0202 0277D	0202
Assistant Intelligence Officer	Captain	0202	0202
Targeting Officer	First Lieutenant	0277	0207
Targeting Officer	First Lieutenant	0207	0207
Intelligence Chief	Gunnery Sergeant	0239	0231
Intelligence Specialist	Sergeant	0271	0231
Imagery Analysis Specialist	Staff Sergeant	0241	0241
Mapped Billets (from Intelligence Battalion)			
Imagery Analysis Specialist	Sergeant	0241	0241
Geographic Intelligence Specialist	Corporal	0261	0261

Source: Headquarters, United States Marine Corps, *Fiscal Year 2025 T/O&E Report for MAG-31*.

Thus, if a MAG, when deployed without a parent MAW, can be expected to operate a small ACI, neither of these MAG T/Os are sufficient to do so and therefore the WISC must provide a tailored ACI detachment that will augment the existing T/O.

It can therefore be expected that the DST for the MAG-sized ACI would include both organic MAG S-2 Marines and the DST augmentation from the WISC. This potentially 'strands' the organic MAG S-2 with respect to training, denying it the training of the WISC's S-3T and the benefits of the WISC's talent management flexibility.

A more appropriate long-term solution might be (like the F-35 recommendation, above) to move all of these BICs into the WISC and map the appropriate MAG DST headquarters element (discussed in Appendix I) back into the MAGs, providing a semi-permanent detachment to support the MAG commander's garrison intelligence support requirements (which may be satisfied by a number smaller than seven or ten—garrison intelligence requirements do not include targeting support, at least). This then simplifies the WISC's ability to train these Marines and provide tailored intelligence support to the MAGs, both in garrison and when deployed.

The residual MAW S-2 T/O is substantially larger, with twenty-four chargeable (i.e., structure authorized by the ASR) active duty intelligence billets. Table 16 depicts these twenty-four chargeable active duty billets.

Table 16. FY2025 T/O for 2d MAW G-2

Billet Description	**Rank**	**BMOS ASD**	**PMOS**
Assistant Chief of Staff G-2	Colonel	8041	8041
Assistant G-2 Officer	Lieutenant Colonel	0202 0277D	0202
Topographic Analyst	Master Sergeant	0261	0261
Information Operations Specialist	Master Sergeant	0211	0211
Intelligence Chief	Master Gunnery Sergeant	0291	0291
Counterintelligence/HUMINT Specialist	Gunnery Sergeant	0211	0211
Intelligence Assistant	Corporal	0271 8623D	0231
ACI Officer	Major	0277	0202
ACI Chief	Master Sergeant	0239	0231
Cyberspace Security Technician	Corporal	1721	1721
Collections Chief	Gunnery Sergeant	0239	0231
Intelligence Assistant	Sergeant	0271	0231
Intelligence Assistant	Lance Corporal	0271	0231
Intelligence Assistant	Lance Corporal	0271	0231
Targeting Intelligence Officer	First Lieutenant	0277	0207
Order of Battle Officer	First Lieutenant	0207	0207
Imagery Intelligence Analyst	Staff Sergeant	0241	0241
Imagery Intelligence Analyst	Sergeant	0241	0241
SIGINT/EW Chief	Master Sergeant	2691	2691
ELINT Chief	Sergeant	2631	2631
ELINT Analyst	Corporal	2631	2631
ELINT Analyst	Lance Corporal	2631	2631
METOC Officer	Chief Warrant Officer 3	6877	6802
METOC Chief	Gunnery Sergeant	6877	6842

Source: Headquarters, United States Marine Corps, *Fiscal Year 2025 T/O&E Report for 2d MAW.*

Further analysis is required to determine the scope of G-2 duties in garrison and G-2 duties (separate from the ACI) when deployed to validate the requirement for these twenty-four billets. It is likely that a number of these senior billets (e.g., gunnery sergeant and above) were established in the G-2 (prior to the WISC) in order to provide community leadership and oversight for Marines within the MOS or specialized sub-OccFld throughout the MAW (e.g., the 0261 master sergeant's duties include some degree of oversight and responsibility over all 0261s in the MAW). However, with the consolidation of many of these specialized MOSs at the WISC, it is no longer clear that these duties need to reside at the G-2 (nor that they would be most effective there).

The result, then, should be the movement of a substantial number of these residual organic MAW G-2 billets into the WISC.

While some may balk at the 'removal' of almost all the organic intelligence structure from MAWs, MAGs, and flying squadrons, this is the case with wing C2 capability (i.e., the MACCS), with the concentration of this structure within the MACG and almost no organic ability to C2 airspace within the MAWs, MAGs, and flying squadrons. The MACG model work effectively for both garrison training of low-density, high-demand MOSs and operationally in combat.

Thus, taken together, it seems that as the WISCs mature and reach FOC and as F-35 squadrons begin outnumbering the VMA and FA-18 VMFA squadrons they replace, T/Os throughout the MAW should be revisited. While such a review is outside the scope of this research, it seems that a possible solution includes the following four elements.

First: the TOECR of VMU and F-35 VMFA intelligence BICs into the WISC with the semi-permanent attachment of DSTs for VMU and F-35 VMFA DSTs. This will enable the WISC to better integrate with these operational units, provide training to their intelligence Marines, train composite DSTs that include VMU and F-35 detachments (e.g., the MEU ACE), and allow the WISC to better talent-manage the Marines at these units.

Second: the TOECR of some or all MAG intelligence BICs into the WISC. Key MAG S-2 leadership (i.e., intelligence officer and chief) might remain organic to the MAG to ensure advocacy of the MAG commander's garrison intelligence requirements. This would perhaps be joined by limited analyst support (e.g., two or three analysts) to support the MAG commander's garrison intelligence production requirements. But a semi-permanent DST may serve these purposes more effectively.

Third: the TOECR of most MAW G-2 BICs into the WISC, including the transfer to the WISC of specialty-MOS oversight and leadership. The MAW G-2 would retain sufficient leadership to assist the MAW CG in directing the WISC as well as sufficient production and analysis capability to support the MAW CG's garrison intelligence requirements (with the WISC gaining the mission of supporting these as well).

Fourth: the change in WISC leadership structure and rank commensurate with these expanded duties and increased size (e.g., elevating the WISC commander from major to lieutenant colonel and the commensurate elevation of other associated billets such as senior enlisted, executive officer, operations officer, etc.). This increased WISC structure (in size and rank) would be enabled by the movement of these currently-residual organic intelligence sections into the WISC and perhaps rank reduction in the semi-permanent DST that would replace it (i.e., perhaps a MAG will rate a captain S-2 in garrison, but a DST led by a major when deployed). This is already envisioned to some extent in the WISC CONEMP.

These tentative recommendations pose some challenges given certain existing rank structure (i.e., why must a MAG S-2 be a major if he or she is only in charge of three Marines?). However, the current WISC structure presents many of the same challenges already (why must a MAG S-2 be a major if he or she is only in charge of *six* Marines?). Such changes would also draw a clearer line between the intelligence support necessary in garrison as compared to that required when deployed. While there are those who would object to differentiating between the two and argue that the Marine Corps should organize in garrison how it intends to fight in combat, Marine aviation already sets a successful operational precedent for such a differentiation with the MACG and the MACCS (whereby garrison organization of MACG differs from deployed organization of the MACCS, specifically to realize the same training efficiencies proposed here and in the WISC CONEMP).

The alternative to these recommendations (i.e., not adjusting and expanding the scope of the WISC over the next five-to-ten years) is to, in part, isolate the T&R advancement of the WISC from the air intelligence elements outside the WISC. This substantially increases the difficulty in successful air intelligence integration to support ACE units and runs counter to both the principals of unity of effort and unity of command. For example, how is a MEU ACE DST, trained at the WISC, expected to integrate with intelligence augments from F-35 and VMU squadrons when composited for deployment? Or how is an ACI expected to integrate effectively in combat when half of it comes from the WISC, where the ACI is trained rigorously, and half of it comes from the MAW G-2, which does not have an S-3T to oversee a robust ACI training program?

The history of any new organization, whether the SRIG, MAWTS-1, or countless other examples, demonstrates that there is significant disruption and growth in the early years. Given the critical importance of intelligence support at F-35 and VMU squadrons as well as the significant growing pains anticipated for the WISC, this research generally concurs with the existing model for bifurcation as an *initial condition* and does not recommend this integration immediately. This research does conclude, however, that this bifurcation is not sustainable in its current form for all of the reasons listed in this appendix.

The Service will be in a better position to evaluate how (or whether) this integration should take place after the WISCs reach FOC. This would also enable other concurrent changes that would have to accompany this integration (e.g., growth in numbers or rank structure).

APPENDIX K

UPDATING THE WEAPONS AND TACTICS TRAINING PROGRAM

As discussed in Chapter 6, the WTTP is explicitly scoped, focusing on operational readiness specifically through unit aviation training programs and support of events within the Aviation T&R Program. MAWTS-1, through the WTTP, is charged with conducting the WTI course, an "instructor certification [program] that [supports] the Marine Aviation T&R Program."[531] However, air intelligence MOSs, to include 0277s, fall outside the Aviation T&R Program, making the WTTP, in its current form, not applicable to air intelligence training. This limits MAWTS-1 Intelligence Department's ability to exercise authoritative oversight and establish Service-wide standards as a center of excellence. Currently it can only develop and disseminate best practices and has no authority to prescribe training or instruction standards within air intelligence.

To rectify this, the WTTP requires only the addition of a paragraph on scope and terminology stating "The WTTP applies to the Aviation T&R Program and the air intelligence components of the Ground T&R Program taking place within the MAWs. All references to the aviation T&R should be construed as applying to air intelligence T&R within the MAWs."

Such a change, coupled with a CMMR that specifically scopes the elements of the Intelligence T&R Manual (and therefore the Ground T&R Program) taking place within the MAW, would expand the scope of the WTTP to apply to air intelligence while strictly containing its authority over the Ground T&R Program to training taking place within the MAWs.

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[531] Commandant of the Marine Corps, *MCO 3500.109 Marine Corps Aviation Weapons and Tactics Training Program*, 2.

A more thorough revision of the order, adding “and air intelligence” after every instance of “Aviation T&R Program” would not only be clumsy but would emphasize air intelligence well beyond its importance in the WTTP. The simple language recommended above, providing the expanded scope, should be sufficient to expand the authority of the WTTP in a way that supports the integration of 0277s into the T&R as envisioned by Appendix D and as recommended in Chapter 8.

APPENDIX L

DISPOSITION OF THE 0277 MOS

There exist diverging views of 0277s and their employment. Since the creation of the MOS, 0277s have been used not like 7577s (i.e., as instructors, instructor trainers, and training program managers) but simply as better-trained air intelligence Marines. Recent changes to the Intelligence WTI course, restricting throughput to twelve and raising minimum rank requirements (to first lieutenant for officers and to staff sergeants for enlisted) met with some resistance that highlighted these divergent views. One Marine's objection that demonstrates this divergent view of 0277s is that the best brief he ever received was from a corporal at the WTI course. This implies the purpose of the WTI course is not to create leaders who will manage and execute oversight over unit training programs but as a course to produce air intelligence Marines that are just a little bit better than their peers. Another objection to throughput reductions was over what proportion of throughput MAGs and MAWs would receive (as opposed to WISCs). This implies that every unit deserves some number of 0277s 'just to have' as opposed to units rating 0277s based on their requirement to conduct and manage complex unit training programs.

While these objections are not inconsistent with the historical misuse of 0277s, they are inconsistent with the findings of this research and the very purpose of the WTI course. In a way, these objections indicate a lack of awareness that what is needed to improve air intelligence is an integrated training solution, not more school seats for corporals at the Intelligence WTI course. Critically, this research found that the thread that runs throughout that integrated training solution is an improved T&R manual. And as the capstone instructor qualification in the air intelligence field, an improved T&R manual's execution should rest on the 0277.

A solution to this issue is suggested by both MAWTS-1's study of the issue and by aviation unit T/Os.

If 0277s are to be used to execute and evaluate robust training plans, they will have limited use at MAGs, given their small size (see Table 14 and Table 15), especially considering the fact that MAGs are to receive a certified DST from the WISC for exercises and deployments. The instructor requirements at the comparatively large residual organic G-2s at MAWs are less clear because it is not apparent what the concept of WISC DST support to a MAW ACI would even be (although, as discussed in Appendix J, this research tentatively concludes that much of this structure can and should be moved into the WISC). However, if a WISC is intended to produce the core of an ACI DST and has the best opportunity to regularly exercise the capability (through regular reach-back support), there is a good argument for the WISC being primarily in charge of this training, too. And finally, the residual structures of the VMUs and F-35 VMFAs will conduct some training, but certainly not to the level and complexity the WISC's mission scope demands (another reason why Appendix J tentatively concludes this structure, too, should be moved into the WISC).

If 0277s are to continue being treated as simply better-trained air intelligence Marines, then most every unit (WISC, F-35 VMFA, VMU, MAG, MAW) can reasonably claim to rate at least one. But with eighteen active duty F-35 squadrons, three VMUs, eleven MAGs, three MAWs, and the seven 0277s required at MAWTS-1, AIOC, and SITCC (see Appendix G), that totals forty-two 0277s (if T/Os are adjusted to provide only one 0277 at each unit—currently, some require more) before any are offered to the WISC. With the ability to sustain approximately sixty-nine total 0277s billets (see Appendix G for a discussion of the relevant math), this affords twenty-seven to the WISCs, just three at each WISC location (only two, when the timeframe to receive a Marine and send them to the WTI course to gain the 0277 MOS is considered; see Appendix G). This affords very little flexibility for the WISC when leave, medical issues, or absences for training, exercises, and deployments are taken into consideration. It is not clear, then, that the air intelligence community can afford to provide every unit with an 0277 without justification.

If 0277s are to be used, instead, as instructors, instructor trainers, and training program managers (as advocated in Appendix G), the question then becomes: where are robust and rigorous training plans being conducted with qualification, designation, and certification determinations that warrant the 0277 MOS? The answer is: the WISC.

The logic of this is validated by aviation unit T/Os. A squadron rates between four and seven 7577 WTIs (squadrons designed to generate a main body and multiple detachments, such as HMLAs and HMHs, have a greater number, ensuring every element has sufficient 7577 WTIs—this is instructive for determining 0277 allocation across WISC detachments). A MAG rates one. A MAW rates none. This is because while MAGs and MAWs conduct and manage some headquarters-level training (i.e., exercises), the robust and rigorous training programs that take place in aviation and result in the granting of qualifications, certifications, and designations take place at the squadron.

MAWTS-1 has recognized since at least the 2016 Intelligence WTI OPT (which convened to address this problem) that neither is the WTI course thought of as a school for intelligence Marines to become *instructors*, nor are 0277s used in that manner when they graduate, despite this being role of WTIs as articulated in the WTTP.[532] This is despite the

[532] Ibid., 7.

description of 0277s as primarily instructors in the MOS manual (see Figure 28; Figure 29 offers a comparison of how the 7577 MOS is described).

To reconcile this, MAWTS-1 has proposed:

- the increase in minimum rank requirements for attendance of the Intelligence WTI course to first lieutenants and staff sergeants
- the reduction of WISC 0277 BMOS/ASD BICs primarily to S-3T and WISC detachment leadership positions (which will partially serve as detachment S-3Ts)
- either the change of MAG and MAW "Targeting Officers" to "Training Officers" (retaining the 0277 requirement on the BIC) or the movement of 0277s (BMOS/ASD but not structure) to the WISC with the expansion of WISC responsibilities to train MAG/MAW intelligence Marines as appropriate (with the instructor framework recommended in Appendix G, this may simply be a requirement to train subordinate instructors at the MAG/MAW to enable those instructors to execute local training plans, as appropriate, with the WISC DSTs for those echelons providing the qualifications that would otherwise require 0277s to instruct and evaluate)[533]

These recommendations are in line with and supported by the findings of this research.

This would entail at least three changes.

First, the adjustment of T/Os as described above. Second, a revision of the 0277 MOS in the MOS manual. Third, the expansion of the WTTP beyond the Aviation T&R Program to include training programs at the WISC and elsewhere within the MAW (discussed in Appendix K) to grant 0277s the authority to execute the duties articulated in Figure 30.

The MOS manual currently describes the 0277 MOS as in Figure 28. By comparison, the MOS manual describes the 7577 MOS as in Figure 29.

The 0277 MOS described in Figure 28, is close to the instructor, instructor trainer, and training program manager recommended by this research. However, it is recommended that the MOS description be adjusted (Figure 30) to reflect the role of the 0277 in the WISC in these

[533] Marine Aviation Weapons and Tactics Squadron One Intelligence Department Head, *Intelligence WTI Proposal* (Marine Corps Air Station Yuma, AZ: Marine Aviation Weapons and Tactics Squadron One, November 27, 2018), 9.

roles as well as the findings of the 2016 Intelligence WTI OPT that an 0277 be a threat SME, mission planner, instructor, and communicator.[534]

9. MOS 0277, Weapons and Tactics Instructor (WTI) Intelligence Officer NMOS (LtCol to 2ndLt) and (CWO5 to WO) (0202, 0203, 0204, 0205, 0206, 0207, 0210, 2602)

a. Summary. Weapons and Tactics and Instructor (WTI) Intelligence Officers are subject matter experts on the tactical employment of threat weapon systems. WTI Intelligence Officers support MAGTF operations by training Marines to develop countermeasures for adversarial aviation threats.

b. Prerequisites. Must have a current Single Scope Background Investigation/T5 Investigation and adjudicated for Sensitive Compartmented Information (SCI) eligibility.

c. Requirements

(1) Must successfully complete the Weapons and Tactics Instructor (WTI)-Intelligence Officer Course (M140JI1), Marine Aviation Weapons and Tactics Squadron 1, MCAS Yuma, AZ.

(2) MOS 0277 may be awarded to both active and reserve officers as a Non-Primary MOS after completing the WTI Course requirements.

d. Duties

(1) As the unit Intelligence Training Officer, develop and execute individual T&R Training and Collective Operational Unit Training.

(2) Serve as the unit SME for intelligence support to mission planning, briefing/debriefing, threat systems and unit weapons system employment. Be responsible for intelligence required for unit's mission in support of the MAGTF and Joint Tasking.

(3) Assist in recommending to unit commanders qualified intelligence personnel for nominate to the WTI Course.

(4) Instructs on current enemy capabilities and tactics to counter the threat.

e. Related Standard Occupational Classification (SOC) Title and Code. Military Enlisted Tactical Operations and Air Weapons Specialist and Crew Members, All Other 55-3019.

f. Related Military Skill. None.

Figure 28. The 0277 MOS. Commandant of the Marine Corps, NAVMC 1200.1D Military Occupational Specialty Manual (Washington, D.C.: Headquarters, United States Marine Corps, May 10, 2018), Enclosure (1), 1-14 - 1-15.

[534] Marine Aviation Weapons and Tactics Squadron One Intelligence Department Head, *Aviation Intelligence Weapons and Tactics Instructor Program Operational Planning Team After-Action*, 1-2.

47. MOS 7577, Weapons and Tactics Instructor (Col to 2ndLt) FMOS

a. Summary. Weapons and Tactics Instructors train aviation personnel in the weapons system for operations in a total threat environment in coordination with ground and other aviation units. This MOS will be assigned only as a Necessary PMOS to qualified aviation personnel.

b. Prerequisites. Top secret security clearance eligibility.

c. Requirements. Complete the Marine Aviation Weapons and Tactics Squadron, WTI- Course (M14P2A1).

d. Duties

(1) Manages a unit weapons and tactics training program.

(2) Performs classroom and flight instruction on various facets of the weapons system.

(3) Provides instruction in the operations and employment of weapons systems.

(4) Analyzes performance and provides corrective guidance.

(5) Instructs on current enemy capabilities and the tactics to counter enemy threats.

e. Related Standard Occupational Classification (SOC) Title and Code. Teachers and Instructors, All Other 25-3099.

f. Related Military Skill. None.

Figure 29. The 7577 MOS. Commandant of the Marine Corps, NAVMC 1200.1D Military Occupational Specialty Manual (Washington, D.C.: Headquarters, United States Marine Corps, May 10, 2018), Enclosure (1), 1-243 - 1-244.

9. MOS 0277, Intelligence Weapons and Tactics Instructor (WTI) NMOS (LtCol to 1stLt) and (GySgt to SSgt) (0202, 0207, 0231)

a. Summary. Intelligence Weapons and Tactics Instructors (WTI) are subject matter experts on the tactical employment of threat weapon systems, expert mission planners, instructors and instructor trainers, and expert communicators. Intelligence WTIs support MAGTF operations by executing air intelligence training programs and evaluating air intelligence training events to produce intelligence Marines and sections qualified and certified to support MAGTF ACEs and other Marine aviation units.

b. Prerequisites. Must have a current Single Scope Background Investigation/TS Investigation and adjudicated for Sensitive Compartmented Information (SCI) eligibility.

c. Requirements

(1) Must successfully complete the Weapons and Tactics Instructor (WTI) Intelligence Officer Course (M140JI1), Marine Aviation Weapons and Tactics Squadron 1, MCAS Yuma, AZ.

(2) MOS 0277 may be awarded to active duty officers and enlisted Marines as an NMOS after completing the WTI Course requirements.

d. Duties

(1) Serves as unit Intelligence Training Officer/SNCO.

(2) Manages a unit weapons and tactics training program.

(3) Performs classroom and practical application instruction and evaluation on mission planning, briefing and debriefing, threat systems, and unit weapons system employment.

(4) Performs classroom and practical application instruction and evaluation on instruction and communication skills.

(5) Analyzes performance and provides corrective guidance.

(6) Recommends to unit commanders qualified intelligence personnel for nomination to the WTI Course, qualification, and designations.

(7) Recommends to unit commanders intelligence direct support teams for certification for deployment.

e. Related Standard Occupational Classification (SOC) Title and Code. 25-3099 Teachers and Instructors, All Other; 55-1019 Military Officer Special and Tactical Operations Leaders, All Other; Military Enlisted Tactical Operations and Air Weapons Specialist and Crew Members, All Other 55-3019.

f. Related Military Skill. None.

Figure 30. Recommended 0277 MOS

APPENDIX M

RECONCILIATION OF OCCUPATIONAL CLASSIFICATIONS

As Table 17 depicts, the various ways in which relevant MOS and OccFlds are classified in various orders, schools, programs, and units has incongruous overlaps that create obstacles to developing a coherent overarching air intelligence training framework. (Neither Table 17 nor the discussion in this appendix are all-inclusive. There are MOSs neither discussed here nor applicable to this research that apply to one or more categories discussed below.)

Table 17. Occupational Classification Divergence across Aviation and Intelligence

<table>
<tr><th colspan="8">Aviation T&R Program</th><th colspan="8">Ground T&R Program</th></tr>
<tr><th colspan="4">Aviation MOSs</th><th colspan="4">Aviation Ground MOSs</th><th colspan="8">Ground MOSs</th></tr>
<tr><td>61xx</td><td>73xx</td><td>75xx</td><td>Etc.</td><td>70xx</td><td>72xx</td><td>Etc.</td><td>68xx</td><td>0277</td><td>0207</td><td>0271</td><td>0202</td><td>0241</td><td>0261</td><td>26xx</td><td>Etc.</td></tr>
<tr><td colspan="7"></td><td colspan="4">Air Intelligence MOSs</td><td colspan="5"></td></tr>
<tr><td colspan="8"></td><td colspan="6">Intelligence T&R Manual</td><td colspan="2"></td></tr>
<tr><td colspan="8">WTTP</td><td colspan="8"></td></tr>
<tr><td colspan="9">WTI</td><td colspan="7"></td></tr>
<tr><td colspan="7"></td><td colspan="8">WISC Intelligence MOSs</td><td></td></tr>
</table>

With the two distinct frameworks used by the Aviation and Ground T&R Programs, the WISC will be challenged to execute both (Aviation with respect to the 68xx MOSs; Ground with respect to the 02xx and 26xx MOSs). This may be simplified by moving the Ground T&R Program framework closer to the crew generation model used in the Aviation T&R Program, by moving the METOC OccFld into the Ground T&R Program, or by some combination of the two.

A move to unit-based T&R manuals would also go some way towards reconciling the issues caused by air intelligence MOS fracturing; however, this would require a significant shift in the T&R construct used by the Service and is, therefore, outside the scope of this study. A

CMMR can help mimic unit-based T&Rs by addressing the training of a unit-like element (the DST) and describing, in one T&R manual, all the training requirements for that element and linking T&R events from other T&R manuals, as necessary.

The WTI course trains Marines whose MOSs predominantly fall under the Aviation T&R Program, with the exception of 0277. The WTTP, however, only applies to the MOSs covered by the Aviation T&R Program (a pending re-write formalizes the Intelligence WTI course's existence, but does not expand the WTTP's applicability to any Ground MOSs). Air intelligence MOSs encompass the subset of 02xx intelligence MOSs with specific air intelligence duties (i.e., 0277, 0207, and 0271) as well as the 68xx OccFld. The Intelligence T&R Manual only covers 02xx MOSs. The intelligence MOSs trained, employed, and deployed by the WISC encompass these air intelligence MOSs with the addition of other generalist and specialized intelligence MOSs covered by the Intelligence T&R Manual, but also including 26xx MOSs (covered by a separate SIGINT T&R Manual).

This overlap (the most problematic area of which revolves around the 0277 and 68xx MOSs) prohibits the implementation of a training framework that can be completely implemented and integrated through a single document or area. For example, both because ground T&R manuals are for MOSs and not for units and because one of the relevant OccFlds (68xx) is subject to the Aviation T&R Program, it would not be possible to write a pure 'WISC T&R Manual' under the Ground T&R Program without changing the framework of the program. It would be even more difficult to write a 'WISC T&R Manual' under the Aviation T&R Program. However, the requisite modifications need not change this.

Just as the MV-22B T&R Manual is technically for MV-22B MOSs and not VMMs, as a unit, it still articulates a CMMR that defines *unit* (VMM) readiness and, in so doing, allows it to be the master training document that holds or references everything necessary for the *unit* to achieve (aviation) training readiness. Similarly, the Intelligence T&R Manual is currently treated as an ‘Intelligence Battalion T&R Manual’ because its chapter two describes the METs of an Intelligence Battalion (and no other unit’s METs) and because nowhere else does readiness reporting rest upon the completion of any events listed within it. In the same way, the ‘SIGINT T&R Manual’ is treated as the ‘Radio Battalion T&R Manual.’ Thus, there is no reason an additional chapter, describing the CMMR of air intelligence elements (linked to a WISC’s readiness reporting), could not be inserted after the current Intelligence T&R Manual chapter two and the requisite training events identified by this research could not be added to the relevant MOS chapters of the manual, turning it into a dual-use ‘Intelligence Battalion and WISC T&R Manual,’ depending on whether one used the METs in chapter two (for Intelligence Battalion) or the CMMR in a new chapter three (for the WISC and other air intelligence elements).

To complete this effort, any new air-specific 26xx events would need to be added to the SIGINT T&R Manual (whether any such air-specific events are needed is outside the scope of this research). And both the (generic or air-specific) 26xx and 68xx events required to be trained to (i.e., those individual events outside the Intelligence T&R Manual) for air intelligence qualifications and certifications would be identified in the CMMR of the Intelligence T&R Manual. Thus, the Intelligence T&R Manual and the MAW TEEP would inform the WISC Commander what his or her training program would have to look like, and the three T&R manuals, together, would provide all of the training events.

APPENDIX N

MAPPING OF CMMR BICS INTO SUPPORTED UNITS

FDP&E requires accurate unit T/O&Es. This will require mapping any developed CMMR (see Appendix I) into the appropriate supported units.

Adaptive Planning and Execution (APEX) is the system used to plan, transition to execution, and execute military operations. Within APEX, CCDR requirements (i.e., requirements for the deployment of units) are articulated in specified and implied tasks that are then translated into force requirements that, at the end of the requirements development process, boil down to a UIC—a unit to deploy (these requirements are articulated as METs, as described in Appendix A).[535]

APEX's force deployment and redeployment planning process requires force providers (i.e., the elements of the Service that source forces to the CCMDs) to conduct and document deployment and movement planning in the Time-Phase Force and Deployment Data (TPFDD), "which contains the detailed data needed to conduct movement."[536] The FDP&E process that results in the generation of the TPFDD starts with the UIC, identifies the unit personnel and equipment to deploy, determines deployment support requirements for this body of personnel and equipment, and plans the movement for this body of personnel and equipment from origin to destination.[537] The T/O&E for the UIC being deployed is the basis for the identification of this body of personnel and equipment.

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[535] Chairman of the Joint Chiefs of Staff, *CJCSG 3122 Time-Phased Force and Deployment Data (TPFDD) Primer* (Washington, D.C.: Joint Chiefs of Staff, June 4, 2014), Enclosure (A), A-2 - A-3.

[536] Chairman of the Joint Chiefs of Staff, *CJCSG 3130 Adaptive Planning and Execution Overview and Policy Framework* (Washington, D.C.: Joint Chiefs of Staff, May 29, 2015., Enclosure (A), A-7.

[537] Commandant of the Marine Corps, *MCO 3000.18B Marine Corps Force Deployment Planning and Execution Manual* (Washington, D.C.: Headquarters, United States Marine Corps, April 27, 2012), Enclosure (1), 1-4.

Thus, the planning to get the necessary force from home station to final destination (in theater) to fulfill CCDR requirements, as conducted through APEX, rests upon the unit's T/O&E, including all personnel and equipment necessary to operate (or for planners to explicitly identify non-T/O&E enablers required within the FDP&E process).

And as the WISC is not intended to deploy or be employed as a complete unit, it is not a force identified or required for deployment in any plans (any such plans would merely call for a squadron, MAG, and/or MAW, making the assumption that those units would include any intelligence support they require). Thus, when air intelligence BICs are removed from flying units and headquarters (as the WISCs activate), the TPFDD for ACE units will be no longer be accurate (F-35 and VMU squadrons being the exception). CCDR operational requirements calling for an HMLA, HMH, VMM, VMA, VMFA (FA-18), or VMGR squadron or detachment will be planned with TPFDDs based on T/Os that include only the air intelligence Marines currently mapped into the unit T/O&Es (which in most cases is a single 0271 staff sergeant—in some cases an 0271 lance corporal is also mapped). Plans calling for MAGs and MAWs will include only the (reduced residual structure of) intelligence Marines that remain organic to those units. In this way, most WISC BICs will be non-deployable, meaning many Marines moved into the WISC to provide improved deployed intelligence support will now face a significant hurdle in deploying with their intended unit.

During FDP&E, there are provisions for including enablers (i.e., additional personnel and equipment not organic to a unit's T/O&E) with units, however, this requires FDP&E planners to be aware of and include these requirements. The history of air intelligence suggests the WISC's DSTs risk being overlooked. Thus, the most reliable solution is to map WISC DSTs (in full) into supported units in order to ensure that WISC DST Marines (and their equipment) are planned for in force deployment and redeployment. By *mapping* these BICs, the requirement to source them (and train and equip them) remains external to the supported unit and the responsibility of the WISC, preserving the integrity of the WISC idea. However, it ensures that when the supported unit is deployed, all WISC Marines that will go with it are accounted and planned for.

This fundamentally requires that at least the number, rank, and MOS of Marines to deploy with a squadron be identified (and associated equipment). This is yet one more reason the development of a CMMR is necessary. The CMMR (see Appendix I) provides this detail, helping to identify what BICs to map into which units.

An immediate solution (though not optimal) is to map the re-capitalized BICs (i.e., those BICs simply shifted from squadrons, MAGs, and MAWs into the WISC) back into the supported units. This will at least maintain the status quo of TPFDDs and APEX planning, while allowing the CMMR to be refined over a longer period.

When CMMRs are finalized, this should result in a TOECR across all three MAWs, mapping these BICs into all relevant supported units. As CMMRs evolve and are updated, they should result in TOECRs to ensure the CMMR in the T&R manual is reflected in the mapped BICs at supported units. This provision should be written into the T&R manual as an administrative note accompanying the CMMR to ensure this detail is not lost in the future.

APPENDIX O

DEFINITIONS

0200—"Basic Intelligence Marine," the MOS enlisted intelligence Marines hold prior to graduation of their PMOS-producing school.[538] In T&R event coding, this can also indicate an event performed by multiple intelligence MOSs (enlisted or enlisted and officer).

0201—"Basic Intelligence Officer," the MOS intelligence officers hold prior to graduation of their PMOS-producing school.[539] In T&R event coding, this can also indicate an event performed by multiple intelligence officer MOSs.

0202—"MAGTF Intelligence Officer." A follow-on PMOS for intelligence officers who are "subject matter experts on all intelligence disciplines and their application across the spectrum of military operations."[540]

0207—"Air Intelligence Officer." An entry-level PMOS for intelligence officers who are "intelligence functional experts at all command levels of the Marine Air Wing (MAW)."[541]

0231—"Intelligence Specialist." An entry-level PMOS for all-source intelligence Marines "familiar with all phases and facets of intelligence operations" including "researching, filtering, recording, analyzing, producing, and disseminating information and intelligence."[542]

0241—"Imagery Analysis Specialist." A lateral-move PMOS for intelligence Marines who "process and analyze imagery gathered by various sensor platforms to derive intelligence."[543]

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[538] Commandant of the Marine Corps, *NAVMC 3500.100B Intelligence Training and Readiness Manual*, Enclosure (1), 5-2.

[539] Ibid.

[540] Commandant of the Marine Corps, *NAVMC 1200.1D Military Occupational Specialty* Manual, Enclosure (1), 1-8.

[541] Ibid., Enclosure (1), 1-12.

[542] Ibid., Enclosure (1), 3-12.

[543] Ibid., Enclosure (1), 3-15.

0261—“Geographic Intelligence Specialist.” An entry-level PMOS for intelligence Marines who “collect, analyze, and process geophysical data and geographic information to aid in the production of geographic intelligence products.”[544]

0271—“Aviation Intelligence Specialist.” A secondary MOS (NMOS) for 0231s assigned to aviation units, “familiar with the six functions of Marine Corps Aviation as well as friendly and enemy aviation and air defense platforms.”[545]

0277—"Weapons and Tactics Instructor Intelligence Officer.” A secondary MOS (NMOS) for intelligence (warrant and unrestricted) officers who are “subject matter experts on the tactical employment of threat weapon systems.”[546]

7577—“Weapons and Tactics Instructor.” A secondary MOS (NMOS) for aviators who “train aviation personnel in the weapons system for operations in a total threat environment in coordination with ground and other aviation units.”[547]

Air Intelligence—“Air intelligence” can refer to a topical area or a personnel/occupational field. When used in the former context, it is defined by Marine Corps doctrine as “the combination of all-source intelligence, training, personnel, and techniques that assesses the weather, adversary, and terrain impacts to the air domain.”[548]

Air Reconnaissance—“Air reconnaissance employs visual observation and/or sensors in aerial vehicles to acquire intelligence information. It supports the intelligence warfighting function and is employed tactically, operationally, and strategically. The three types of air reconnaissance are visual, multisensor imagery, and electronic.”[549]

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[544] Ibid., Enclosure (1), 3-17.
[545] Ibid., Enclosure (1), 3-18.
[546] Ibid., Enclosure (1), 1-14.
[547] Ibid., Enclosure (1), 1-243.
[548] Headquarters, United States Marine Corps, *MCRP 2-10A.9 Air Intelligence*, 1.
[549] Headquarters, United States Marine Corps, *MCWP 3-20 Aviation Operations*, 2-4.

Air Superiority—"That degree of control of the air by one force that permits the conduct of its operations at a given time and place without prohibitive interference from air and missile threats."[550]

AMOS—An AMOS is "any existing MOS awarded to a Marine who already holds a PMOS" (a PMOS becomes an AMOS after a new PMOS is granted).[551]

ASD—Any MOS used for or to track additional skills not assignable as a PMOS.

ACE—"The core element of a Marine air-ground task force that is task-organized to conduct aviation operations. The aviation combat element provides all or a portion of the six functions of Marine aviation necessary to accomplish the Marine air-ground task force's mission. These functions are antiair warfare, offensive air support, assault support, electronic warfare, air reconnaissance, and control of aircraft and missiles. The aviation combat element is usually composed of an aviation unit headquarters and various other aviation units or their detachments. It can vary in size from a small aviation detachment of specifically required aircraft to one or more Marine aircraft wings. The aviation combat element may contain other Service or foreign military forces assigned or attached to the Marine air-ground task force. The aviation combat element itself is not a formal command."[552]

Aviation Ground MOS—Any non-flying MOS covered under the Aviation T&R Program.

BIC—A unique, serialized billet in Marine Corps Structure indicating the rank, MOS, and any additional skills of a Marine required to fill that piece of structure.

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[550] United States Department of Defense, *DOD Dictionary of Military and Associated Terms* (Washington, D.C.: United States Department of Defense, 2018), 15.

[551] Commandant of the Marine Corps, *NAVMC 1200.1D Military Occupational Specialty* Manual, Enclosure (1), xiii.

[552] Headquarters, United States Marine Corps, *MCWP 3-20 Aviation Operations*, B-3.

Concept—A military concept is "an expression of how something might be done; a visualization of future operations that describes how warfighters, using military art and science, might employ capabilities to meet future challenges and exploit future opportunities."[553]

Core MET—"A task that all units of the same type are organized, trained, and equipped to perform."[554]

Core Plus MET—"A task that may be required of a unit, but not all units of the same type, in addition to its core METs. Core plus METs reflect additional capabilities that may be required to support a specific CCDR or a mission that is limited in duration or scope; additional resources (personnel, equipment, or training) may be required to perform a core plus MET."[555]

Intelligence OccFld—Intelligence OccFlds include 02 (Intelligence), 26 (Signals Intelligence/Electronic Warfare/Cyberspace Operations), and 68 (METOC).

MCISRE—"The MCISRE is the mechanism that merges disparate nodes of the Marine Corps intelligence effort into a cohesive, mutually reinforcing whole."[556]

MET—"An externally focused task that is critical to mission accomplishment."[557]

METL—"The set of all METs that a unit is organized, trained, and equipped to perform. An assigned METL is the set of all core, core plus, and assigned METs for a unit critical to a single mission, operation, or deployment."[558]

MOJT—"Training conducted in the unit environment which utilizes a combination of classroom instruction and practical application. The classroom instructor is also the work supervisor of the

[553] Commandant of the Marine Corps, *U.S. Marine Corps: Concepts & Programs 2018* (Washington, D.C.: Headquarters, United States Marine Corps, March 7, 2018), 7.

[554] Commandant of the Marine Corps, *MCO 3502.6A Marine Corps Force Generation Process*, 2.

[555] Ibid.

[556] Marine Corps Director of Intelligence, *Marine Corps Intelligence, Surveillance, & Reconnaissance Enterprise Plan 2015-2020* (Washington, D.C.: Headquarters, United States Marine Corps, September 2014), 14.

[557] Commandant of the Marine Corps, *MCO 3502.6A Marine Corps Force Generation Process*, 2.

[558] Ibid.

trainee. Evaluation of the students is based upon the capability to demonstrate specific training standards."[559]

MOS—An "MOS is a four-digit code consisting of the OccFld code completed by two additional digits. It describes a set of related duties and tasks that extend over one or more grades required by units of the Operating Forces and Supporting Establishment. The MOS is used to identify skill-knowledge requirements of billets in T/Os."[560]

NMOS—An NMOS is a "non-PMOS that has a prerequisite of one or more PMOSs. This MOS identifies a particular skill or training that is in addition to a Marine's PMOS, but can only be filled by a Marine with a specific PMOS."[561]

OccFld—An OccFld is defined by the first two digits of a four-digit MOS code, grouping related MOSs. MOSs are considered to be related based on: "the total number of Marines in the OccFld, the number of MOSs (diversity), unity of functional management, and training requirements."[562]

Organic—An element or elements on a unit's T/O&E; in contrast to temporary augmentees, attachments, or enablers.

PMOS—A PMOS is "used to identify the primary skills and knowledge of a Marine" and is used for the purposes of classification into occupational sub-fields for initial training and, later, for the basis of promotion.[563]

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[559] Headquarters, United States Marine Corps, *MCTP 8-10A Unit Training Management Guide* (Washington, D.C.: Headquarters, United States Marine Corps, 2016), H-5.

[560] Commandant of the Marine Corps, *NAVMC 1200.1D Military Occupational Specialty* Manual, Enclosure (1), viii.

[561] Ibid., Enclosure (1), xv.

[562] Ibid., Enclosure (1), viii.

[563] Ibid., Enclosure (1), xv.

POI—"A POI is a service-level training and education management document that describes a formal course in terms of structure, delivery systems, length, intended learning objectives or outcomes, and evaluation procedures."[564]

TEEP—A "standard scheduling/planning tool … [to identify] unit, personnel, and resource conflicts prior to the execution of training exercises, deployments, or actual contingency operations."[565]

Structure—"Structure refers to billets required to accomplish the command mission. Structure does not equate to manning, which is the process of placing personnel in specific billets."[566]

WTI—Weapons and Tactics Instructor. In this study, the term WTI is used in two primary categories: the course and the MOS (granted after successful completion of the course, for eligible MOSs). Within the MOS usage, however, WTI can refer to a wide range of MOSs depending on the community within which it is used.

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[564] Commandant of the Marine Corps 2015, *NAVMC 1553.2 Marine Corps Formal School Management Policy*, Enclosure (1), 1-3.

[565] Headquarters, United States Marine Corps, *MCTP 8-10A Unit Training Management Guide*, 6-2.

[566] Buikema, 5.

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