

Appendix A

The State of Fleet Marine Force Communications Summer 1990

Fleet Marine Force Communications Organization

Introduction

To provide communications support for Marine air-ground task forces (MAGTFs), the Marine Corps of 1990 fielded a variety of specialized units within the Fleet Marine Force. The commanding generals of the three standing Marine Expeditionary Forces (MEFs) each possessed several communication organizations either directly under their command or embedded in the commands of their major subordinate elements, normally a Marine Division (MarDiv), a Marine aircraft wing (MAW), and a force service support group (FSSG).^{*} Although these three elements—ground combat, air combat, and combat service support—are recognized by the Marine Corps in principle as separate functional components of a MAGTF under a common command element (CE), in practice their internal communications systems are rarely isolated from one another due to the intermixing of units and subunits throughout the MAGTF's area of responsibility.

The Organization of MEF Communications

At the top of the communications hierarchy of the Corps' largest standing MAGTF in 1990—the Marine Expeditionary Force—stood the headquarters of the commanding general, which since 1988 had been known as the MEF Command Element. This command element administratively grouped the Marines of the MEF general staff into a headquarters company, but for operational support the staff was divided into sections according to functional areas of responsibility. The traditional division of labor on the MEF principal staff had grown in the previous decade from the familiar G-1, -2, -3, and -4 sections, along with a host of so-called special staff functional areas to include by 1990 peacetime standing G-5 through G-7 sections. In the 1980s, the MEF G-6 section was created by combining the communications-electronics officer (CEO) section and that of the information systems officer (ISMO). Prior to then, both had existed as separate

special staff sections. The G-6 section was responsible for the overall planning and direction of communications, information systems, and electronic maintenance functions of both the MEF CE and the MEF-wide command and control communications network.

The Surveillance, Reconnaissance, and Intelligence Group

The Marine Expeditionary Force had under its direct control an assortment of specialized supporting units designed to provide intelligence, communication, reconnaissance, liaison, and surveillance to the force. Besides separate battalions, these specialized units included smaller units such as the force reconnaissance company, the air and naval gunfire liaison company (ANGLICO), and the force imagery interpretation unit (FIIU). All were combined in 1988 under a single headquarters element known as the surveillance, reconnaissance, and intelligence group, or SRIG. An intelligence company headquarters was created over some of the intelligence-related “cats and dogs” units in order to better train, task, and coordinate them in support of the MEF’s activities.

Although envisioned as a “type command” in the sense that it was to have a training, support, and “advocacy” role—as opposed to operational command—with regard to its disparate subordinate elements, the SRIG headquarters was provided a S-6/CEO position on the staff to facilitate and coordinate communications and information systems support of the force headquarters as well as to serve as a go-between for external equipment requests and related issues. Given that the section called for only a major communications officer and a master sergeant communications chief, its ability to give operational direction was quite limited, considering that it was “wedged” between the much larger operations sections of the MEF G-6 and the communication battalion S-3.

The Communication Battalion, FMF

Although not apparent from the title of its parent outfit, the communication battalion was the largest single subordinate unit of the SRIG. With a primary mission of providing the communications paths among the MEF or MEB CE and its major subordinate elements, the Corps’ three communication battalions had, prior to the creation of the SRIG, often found themselves administratively subordinated to division or FSSG headquarters instead of being directly under the control of the MEF.

The communication battalion in 1990 consisted of 43 officers and 841 enlisted men and women organized into a Headquarters and Service Company of 13 officers and 86 enlisted Marines; a Support Company of 10 officers and 371 enlisted Marines; and two communication companies, each at a strength of 10 officers and 192 enlisted Marines.¹ These last two “letter” communication companies each consisted of a company headquarters section, a single- and multi-channel radio platoon, a wire platoon, and a communications center platoon. The headquarters company contained the battalion’s motor transport, consolidated maintenance, supply, and headquarters platoons. The support company contained

the construction platoon and the communication support platoon, which owned all of the battalion's long-range or "long-haul" satellite multi-channel communication equipment.

The battalion was organized in order to support readily either a single MEF CE or, alternatively, two separate Marine Expeditionary Brigade (MEB) command elements. In the latter case, each MEB CE would receive a communication company that was appropriately reinforced by elements from the battalion's headquarters and service and support companies. In this case, the battalion commander and his staff either stayed with the residual elements in the rear or located with the MEB which represented the MEF's point of main effort. Because of this concept of operations, each of the communication companies was provided a small operations section headed by a lieutenant in order to facilitate the planning of MEB missions independent of the battalion's S-3 section.

The Special Security Communications Team

Outside of the communication battalion and directly subordinate to the MEF G-2 was the Special Security Communications Team (SSCT). This team, which was composed of about a dozen specially trained communications and signals intelligence Marines, operated the terminal communications equipment for the MEF's Special Compartmented Information Facility (SCIF). This team used existing communications paths provided by the communication battalion, but once the signal was broken out from the transmission equipment it was physically isolated from the larger system and encrypted using special higher security codes.

The SCIF provided a sanitized work area in which highly classified intelligence material could be collected, stored, and communicated. To be properly secured, the SCIF needed to be both physically and electronically isolated from other spaces and systems. These stringent requirements for security often made communications installation, troubleshooting, and repair an unusually difficult process because few outside personnel possessed the appropriate security clearance necessary to work within the facility.

Marine Aircraft Wing Communications

As was the case with the MEF, the Marine aircraft wing staff contained a G-6 section headed by a colonel. The wing G-6 section included subsections for operations, information systems, and electronic maintenance, but the latter was tailored toward the support of wing unique air control equipment in addition to the ground common communications and electronics equipment found throughout the MAW.

Marine Air Control Group

Marine aircraft wings in 1990 had no one FMF-wide fixed organization, but

consisted of a separate Marine wing headquarters squadron (MWHS), from two to five Marine aircraft groups (MAG), a Marine wing support group (MWSG), and a Marine air control group (MACG). Aside from the headquarters squadrons and the two stateside MACGs, none of these subordinate groups was exactly alike, as they reflected a task-organized approach that depended heavily upon the geographic location and likely mission assigned to each MEF.

The Marine air control group, which established and operated the Marine air command and control system (MACCS) for the wing commander, consisted of an array of specialized squadrons and battalions which reflected the disciplines of air control, air defense, air support, air traffic control, and communications. These disciplines were used by the group to execute one of the six functions of Marine aviation: control of aircraft and missiles.* To do so effectively, the Marine Corps provided for a sizeable network of communications personnel and equipment distributed throughout the MACG, although none of the former were assigned to the staff of the group commander.

The Marine Wing Communication Squadron

Outside of the SRIG, the largest dedicated communications unit in the MEF resided in the Marine aircraft wing. The Marine Wing Communication Squadron—as noted above, a subordinate element of the MAW’s Marine Air Control Group—had the mission of providing the communications paths between the wing headquarters and its subordinate units. This mission in practice translated into two sometimes competing communications tasks. The first was to link the tactical air command center (TACC) with the subordinate agencies of the Marine air command and control system: the tactical air operations center and the direct air support center (DASC).** The principal means of communication among these agencies was through operator-to-operator “hot lines” over multi-channel radio links. The second task of the squadron was to establish communications from the Wing headquarters to its typically scattered subordinate Marine aircraft groups and Marine wing support group. This was also accomplished using multi-channel radio links, but common user telephone trunks rather than “hot lines” were meant to be the principal mode of communication among them. With limited numbers of multi-channel radio links, the competition for priority between “hot lines” and telephone trunks was often keen.

Like the communication battalion, the MWCS was organized to support the one MEF/two MEB concept in effect in 1990. Since the squadron’s manning and organization fell under the auspices of the Deputy Chief of Staff for Aviation (DC/S Air) at Headquarters, U. S. Marine Corps, in practice this resulted in a significantly different structure than was seen in the AC/S C4I-sponsored ground communication units.* The communications squadron was organized into two large (company-size) detachments of 11 officers and 191 enlisted Marines, two small (platoon-size) units of 2 officers and 44 enlisted Marines, and a squadron headquarters of 7 officers and 36 enlisted Marines, for a total of 539 personnel. Since each MEB was expected to consist of a composite MAG spread between a fixed-wing airfield and a rotary-wing airfield, and since it was assumed that the

composite MAG headquarters, the TACC, and much of the logistics support would be based at the fixed-wing airfield, a “MEB slice” of the MWCS would consist of one communications detachment to support the fixed-wing site with its TACC and the MAG headquarters and one communications unit to support the presumably more austere rotary-wing site.

Similar to a communication company, the MWCS communication detachment consisted of the four “core” functional platoons of single-channel radio, multi-channel radio, field message center, and wire, although the multi-channel radio platoon contained “long-haul” (beyond line-of-sight) equipment not found in the former. Additionally, and in a fundamental contrast to the structure of the communication companies of the communications battalion, by table of organization (T/O) the communication detachments and (to a lesser extent) the communication units of the MWCS included their own organic communications-electronics, utilities, and motor transport maintenance personnel as well as personnel for administration and supply. Thus, a T/O detachment in theory required no reinforcement from its parent squadron to perform a MEB-sized mission. The detachment headquarters included an operations section consisting of a captain, a warrant officer, and three enlisted Marines. The commander was also “dual-hatted” as the staff communications officer of the supported composite MAG. As in the case of the communication battalion, in a two-MEB split the MWCS commander would locate himself, his principal staff, and residual squadron elements where appropriate. The squadron and independent detachment commanders were in an interesting position in that the MACG, unlike the SRIG, exercised operational control as well as command over the wing’s “long-haul” communications assets and thus was directly concerned with their tasking and employment.

Other MACCS Agencies and MACG Units

In addition to the MWCS, the MACG contained numerous other squadrons and battalions organized either to perform a function of Marine aviation or to support or direct an aspect of the operation of the Marine air command and control system. Each had some degree of unique internal communications requirements and, as such, each contained an organic communications section or platoon to assist in the accomplishment of its mission.

The headquarters and headquarters squadron (H&HS), which provided both the TACC facility (or the “bubble,” as it was more commonly known) and the aviation ground officer and enlisted personnel necessary to ensure its proper smooth operation, possessed a small external communications suite designed specifically to transmit and receive Tactical Data Information Links “A” and “C” (TADIL A and C) from a broadcasting ship, aircraft, or ground radar station. Other than internal console-to-console communications and the TADIL A and C radio equipment, internal telephone and external single- and multi-channel radio communications connectivity to the MACCS’ outlying agencies and units were provided to the H&HS by the MWCS. Field message center (FMC) service was to be provided by the MWCS through the main message center located with the MAW Headquarters.

A similar supporting relationship existed between the MWCS and the Marine air traffic control squadron of the MACG. The internal headquarters telephone service for the MATCS was provided by the MWCS, as were the paths for the various non-doctrinal "hot lines" linking air traffic control detachments at each of the wing's airfields. Message traffic service was provided through the field message center operated by the MWCS at each airfield, while tactical telephone service was operated and maintained by the telephone section of the Marine wing support squadron, also resident at each airfield.

The two Marine air control squadrons normally found in each MACG possessed a significantly more robust communications capability than that of the MATCS and H&HS, since they were not specifically tied to operating at or near airfield sites. While the MWCS provided the multi-channel radio paths between the squadrons' TAOC and the TACC as well as the occasional link to a subordinate automated early warning and control (EW/C) site, internal telephone and external single channel radio circuits were established using organic personnel and equipment. When necessary, the MWCS provided a field message center section for the TAOC.

The MACG's light anti-aircraft missile (LAAM) battalion, which operated the all-weather Improved HAWK (I-HAWK) missile system, contained an organic communications platoon within its headquarters battery. This platoon operated single- and multi-channel radio paths among the battalion's operations center, its firing batteries, platoons, and units, and the TAOC. It was dependent upon the MWCS-provided FMC at the TAOC for record message traffic, but it operated and maintained its own telephone switchboard, often in conjunction with the TAOC near which it often was located. The Stinger missile-equipped low altitude air defense (LAAD) battalion also possessed an organic communications platoon, although its capabilities were limited to installing the single channel radio nets that connected the battalion to its missile batteries and to the TAOC. For field message center and tactical telephone service, the battalion was to "piggy back" off the TAOC or other neighboring units.

Finally, the Marine air support squadron (MASS), which established and operated the wing's DASC, also possessed a robust single-channel radio capability. The DASC was generally located with the MAGTF's ground combat element headquarters. The MWCS T/O also contained a field message center section for the DASC, but in practice the DASC tended to "piggy back" on the division or regimental command post with which it was normally collocated. Although the MWCS had multi-channel radio equipment used to link the DASC to a nearby airfield or MACCS agency, the DASC's collocation with the ground combat element headquarters created distances between it and the rest of the wing communications network which often exceeded the reliable operating range of the available multi-channel radio equipment.

The Marine Wing Support Squadron

The wing communication squadron by mission statement was responsible for inter-airfield and inter-agency communications, with the major exception being

MAW and MACG headquarters support. Certain units within the MACG accessed the tactical telephone system through the resident Marine wing support squadron (MWSS). The same was true of Marine aircraft group headquarters and their subordinate aircraft and aviation logistics squadrons, which by table of organization possessed no organic tactical communications capabilities. In addition to tactical telephone service provided from the MWSS, the MAG would also receive ground-based tactical radios for its doctrinal group and squadron common radio nets.

In order to provide for internal MWSS and airfield communications, the MWSS by T/O included a communication section consisting of 22 Marines headed by a gunnery sergeant which had the mission of providing tactical telephone and single-channel radio support to both the MWSS and other tenant units, including the resident MWCS unit. The MWSS communication section also possessed a limited communications-electronics maintenance capability for its organic equipment. Like the MAG headquarters, the Marine wing support group headquarters did not have an organic communications section, and thus it also “piggy-backed” on one of its subordinate MWSS in the field. The group did have a billet for a communication chief to coordinate group-wide requirements.

Marine Division Communications

As was the case with the MEF and the MAW, the Marine division general staff included a G-6 section. Headed by a colonel with a lieutenant colonel assistant, the G-6 section included two majors and a captain as deputies for operations, electronic maintenance, and information systems management. Senior staff noncommissioned officers brought added depth and experience to each of these areas.

Communication Company, Marine Division, FMF

Located within the headquarters battalion of the Marine division, the division communication company’s mission was to provide internal communications to the division headquarters as well as communications to its subordinate regiments and separate battalions.* Commanded by a major and with a strength of 14 officers and 317 enlisted Marines, the company closely resembled the MWCS communication detachment in its basic structure, although some important differences existed. Besides containing only line-of-site VHF communication equipment in its multi-channel radio platoon with which to link the division and regimental command posts, it had fielded since 1988 a position locating and reporting system (PLRS) platoon in addition to the “core” single-channel radio, wire, and field message center platoons. By table of organization it also contained an air and naval gunfire platoon, but this had long before fallen into a cadre or inactive status. Like the MWCS communications detachment, the company possessed its own limited intermediate communications-electronics, utilities, and motor transport maintenance platoon. It remained dependent for administrative and supply functions on the division headquarters battalion.

Regimental and Battalion Communications

Each of the Marine division's four regimental headquarters (three infantry and one artillery), their subordinate battalions, and the five separate battalions of the division possessed an organic communications platoon. In the case of the infantry regiments, each had a major as the regimental communications officer with a lieutenant assistant and a platoon of 77 Marines. The platoon supported the regimental command post with tactical telephone, radio and field message center service and tied it with its subordinate battalions via single- and multi-channel radio equipment. The separate and subordinate infantry and artillery battalions were similarly configured, except that the former's communication platoons were generally headed by captains and the latter's lieutenants. None possessed a field message center or a multi-channel radio capability.

Force Service Support Group Communications

As was the case with the MEF, division, and wing staffs, the FSSG staff included a G-6 section, although the section head by billet was a lieutenant colonel as opposed to colonel as the other commands. In keeping with the two MEB per MEF concept, the FSSG also included two standing brigade service support group (BSSG) command elements, but like a composite MAG the staff was merely a nucleus and its communications expertise would be provided by the commander of the supporting detachment from the communication company.

Communication Company, Force Service Support Group

Located within its headquarters battalion, the FSSG's communication company was organized to suit the unique requirements presented by regularly deploying combat service support (CSS) elements. Commanded by a major and with a strength of 13 officers and 346 enlisted Marines, the company's mission was to provide support to the group headquarters or to smaller independent task-organized CSS elements and to connect those headquarters with their subordinate battalions and detachments. In order to perform this mission, the company was organized into five CSSE communication platoons of approximately 40 Marines (designed to support 2 BSSGs and 3 MEU service support groups), one communication support platoon of over 100 individuals which included functional sections of field message center, wire, single-channel, and multi-channel radio, and a combined limited intermediate maintenance platoon.

FSSG Subordinate Battalion Communications

Communications capabilities within the seven functional battalions of the FSSG varied greatly with the mission of the particular unit. The group's landing support battalion rated a large communications platoon of more than 80 Marines headed by a captain, while the engineer support battalion's platoon was only 30 Marines commanded by a lieutenant. The medical and motor transport battalions

each had a communications section, although in the case of the former it was headed by a lieutenant rather than by a staff noncommissioned officer communication chief. The supply, maintenance, and dental battalions possessed no organic tactical communications means, and as such received their required support directly from the group's communication company.

FMF Communications Equipment

Introduction

The summer of 1990 found the Marine Corps on the verge of a fundamental transition in communications. Since the advent of radio early in the 20th century, the Corps had procured and adopted successive generations of both military and civilian radio sets in an attempt to meet the ever-increasing demand of the Fleet Marine Force for communications equipment suited to the requirements of expeditionary and amphibious warfare. Although the FMF communications equipment in wide use in 1990 represented a capability many times greater than that in use even a quarter century earlier, the vast majority of this equipment was designed for and ultimately limited by a foundation of analog electronics.

Satellite Communications Equipment

This analog foundation of FMF communications began to shift in the early 1980s with the introduction of both man-portable satellite communication (SATCOM) radios and vehicle-mounted ground mobile forces (GMF) satellite communication equipment into the FMF communication battalions. By the end of the decade, the frequency-hopping single-channel ground-air radio system (SINCARS) also began to appear, albeit in small numbers for selected units. The GMF equipment suites fielded by each MEF consisted of one AN/TSC-85 set (or "hub") and four AN/TSC-93 sets (or "spokes"). With this equipment, the MEF could establish a point-to-point link using two TSC-93s, or if more than two locations were required to be connected, the TSC-85 would be used to communicate with multiple outlying TSC-93s (thus yielding the "hub-spoke" description). Each TSC-93 could transmit and receive a combination of discrete analog channels or digital information, depending on the available satellite bandwidth. Also present in the communication battalion were 30 sets of the PSC-3 man-portable single channel UHF SATCOM radio, which were generally used to carry the high-priority tactical command voice circuits among the MAGTF commander and his major subordinates.

Although the broadcast frequency (or carrier wave) of this satellite communications equipment was analog, the intelligible information carried by this analog wavelength was in digital form. However, once this information was received by this terminal equipment on the FMF end of the link, it was translated into analog form before it was switched and transmitted among major USMC ground tactical communications stations and nodes.

Switching and Technical Control Equipment

In August 1990 ground communications nodes were composed of a limited variety of basic equipment. At the heart of a major node such as a MEF, division, wing or FSSG main command post would be a TSQ-84A technical control (or TechCon) shelter. Within this shelter, trained technical controllers could manually patch a specific signal from a discrete channel originating from a radio or telephone at one point (or point “A”) to another (point “B”). If the signal in question was relatively weak, it could be boosted by the technical controllers if desired using small amplifiers. The signal could also be filtered to remove excess noise, since the terminal equipment at point B—whether a Marine or a display scope—might otherwise find the signal to be unintelligible.

Depending upon its routing, after the signal left the TechCon van it might travel to a telephone on a desk via a switchboard over “hard” wire. The Corps operated both “automated” and “manual” tactical telephone switchboards. With the former, one could normally dial through to the desired number without the switchboard operator’s intervention, while the latter required the signal to be patched manually down the desired path by the operator. If that path was a dedicated channel between two switchboards, that channel was called a telephone “trunk.” In wide use in 1990 were two automated switchboards: the AN/TCC-38 telephone switching van, which could terminate some 300 assorted telephones, and the SB-3614, which was a “man-portable” switchboard capable of terminating 30 telephones. It could, by being “stacked” with two others, expand that number to almost 90 telephones. The manual switchboard in wide but declining use at that time was the SB-22. It had a capacity of only 12 telephones but could, like the SB-3614, be “stacked” with others of its type to provide additional capacity without an increase in switchboard operators.

Terrestrial Multi-channel Radio Equipment

Instead of going from a telephone switch directly over wire to a local telephone, a signal could also go to a switchboard or even a single telephone at a distant site (in which the latter was labeled a “long local”) via multi-channel radio equipment. Another variation of this was a “hot line,” in which two or more analog telephones were directly connected over wire or multi-channel radio without being routed through an intermediate switch.

Terrestrial multi-channel radio equipment used essentially two modes of radio wave propagation. The first mode was line-of-sight (LOS), in which the antennas of the transmitting and receiving equipment generally had to be within straight line distance of each other. Depending on other factors such as frequency, iron content of the soil, and electronic interference, this could be slightly shorter or longer than actual line-of-sight. The maximum LOS distance normally encountered in flat terrain was 30 to 35 miles, assuming that antenna heights were within a dozen or so feet of the ground. The second mode of communication was through troposcatter propagation, which consisted of reflecting or

“bouncing” radio waves off the ionized portion of the earth’s upper atmosphere between two ground stations. Thus, the ground stations could be beyond LOS distance apart and still be in communication range. The normal range for this mode of radio wave communication was from 40 to 120 miles.

The Marine Corps possessed several types of radio transceivers designed for the purpose of connecting widely separated sites and their associated telephone switches and technical control facilities. With an effective range of nearly 90 miles and the ability to transmit and receive simultaneously (known as “duplex” operation in the parlance) 12 distinct and separate channels of information on one frequency, the AN/GRC-201 Super High Frequency (SHF, or “microwave”) radio system had served as the “backbone” of MEF internal communications for more than a decade. With two sets “slaved” at each end of the link, the GRC-201 could be operated as a 24-channel radio, with sets at each end operating on two frequencies as either dedicated transmitters or receivers.

With the introduction of the GMF satellite system, the GRC-201 had been relegated to a secondary means of tying together the MEF headquarters with its major subordinates, but it was still used extensively within the Marine aircraft wing (the only owner outside the communication battalion) to link its scattered air control agencies and aircraft groups. It was particularly valued by the wing for several reasons. First, it was not dependent on satellite access for its operation, so the level of coordination required for its employment was much less than the MEF’s GMF terminals and it also was not subject to preemption by joint or other service SATCOM requirements. Second, the GRC-201’s relatively slow installation time (normally several days at a minimum for the link to “settle down”) was not likely to hamper wing operations, since the aircraft groups and air control agencies normally tied together with this equipment did not frequently or rapidly displace. Third, although not considered fully secure by National Security Agency (NSA) standards, the GRC-201 used bulk encryption devices that provided for at least a modicum of communications security (COMSEC) to the subscriber.

The more common piece of multi-channel equipment found in the MEF was the AN/MRC-135, an eight-channel, very high frequency (VHF), HMMWV- or jeep-mounted radio set with a maximum range of approximately 35 miles.* In service with virtually every FMF communications unit at or above the regimental level, this radio offered both advantages and disadvantages to the user, depending upon one’s perspective. A MRC-135 link (or “shot”) could be generally installed in a couple of hours, but it was highly vulnerable to enemy direction-finding units, and the signal that it broadcast was not encrypted. Its limited range could be easily outrun by maneuver battalions, and it also tended to overheat in hot weather. As one might expect, these latter qualities of the MRC-135 endeared it neither to its operators nor to those whom it was intended to support.

Single Channel Radio Equipment

In 1989, FMF units by and large communicated with each other via the same tactical VHF radios that they had for the previous 20 years. Known as the

AN/VRC-12 family of radio equipment, it encompassed the mobile high-powered VHF radios found on tanks, AAVs, and communication vehicles. These were fully compatible with the PRC-77, which was the basic infantry battalion man-portable radio known to virtually all division Marines of the 1970s and 1980s.

This generation of radios was programmed to be replaced by the SINCGARS family of VHF frequency-hopping radios with embedded cryptographic circuitry. Although this was to start in the mid-1980s, a series of program setbacks repeatedly delayed this exchange so that by August of 1990 only one FMF unit—the 1st Light Armored Infantry (LAI) Battalion—was equipped with a version of this radio. Other LAI units operated the Bancroft KY-67 radio, which was non-frequency hopping but contained embedded VINSON cryptographic circuitry used by other units, while the rest of the FMF continued to use the VRC-12 radio equipment.

Field Message Center and Data Processing Equipment

Beginning in the middle 1980s, various Fleet Marine Force communications units sought to harness the capabilities offered by the expanding world of the microcomputer. The rapid growth in the use of networked personal computers throughout the Department of Defense, coupled with their declining size and cost and increasing power and flexibility, steadily highlighted their potential as tools for tactical military communications. By the end of the decade, successful field tests had been undertaken where computer-to-computer data transfer had been accomplished over a variety of tactical single and multi-channel radio systems in the FMF.

By the summer of 1990, these successes had in many ways bred problems of their own. Since military-specification (mil-spec) or “green” microcomputers had been purchased in relatively small numbers, much of the testing and exercise support of tactical communications had been conducted using commercial or “white” computers. The “green” microcomputers, known as the AN/UYK-83 and the AN/UYK-85, had been fielded by the Corps to support automated maintenance and supply management, personnel reporting, and limited word processing functions, but not for use as tactical communications instruments. FMF communications units still possessed an array of analog teletype equipment—ranging from technologically ancient “grey” gear mounted in deployable shelters to the relatively modern but increasingly outdated AN/UGC-74—to pass record message traffic to one another. While this series of equipment was increasingly viewed by the FMF as anachronistic at best, the testing, procurement, and fielding of modern field-worthy microcomputers could simply not keep up with the FMF’s growing demand for them. Even the relatively new TSC-96, which was a shelter-mounted message center that utilized a UHF WSC-3 satellite transceiver to access directly the shore-based naval telecommunications system, had fallen out of favor because of its limited data storage capability and its inability to accept from or deliver to the customer information via floppy disk.

Position Locating and Reporting System

Starting in 1988, the Marine Corps took delivery of a communication system that promised to change radically the way commanders at all levels viewed the battlefield. Called the position locating and reporting system (PLRS), it was designed as an electronic navigation tool that would provide subscribers outfitted with basic user units (BUUs) both absolute and relative bearing information. At higher levels (normally a division main or alternate command post), commanders equipped with a PLRS master station could monitor a visual display of the location of every subordinate unit possessing a BUU.

The PLRS network was operated and maintained by the PLRS platoon of the division communication company, although BUUs were distributed throughout the MEF. The system consisted of four master stations and up to 400 BUUs per MEF. BUUs were encrypted radios that could transmit, receive, and relay the location of any other BUUs within line-of-sight distance. The data from one BUU could be relayed through up to four other BUUs before it had to be processed through a master station. Thus, virtually every BUU could communicate with the master station unless it was more than approximately 20 miles from another unit. Short 10-digit numeric messages could be transmitted throughout the system along with navigational data.

PLRS did have certain drawbacks which made it unattractive to some commanders. The PLRS master station was normally mounted on the back of a five-ton truck, and had a number of support vehicles and generators in tow. The large physical presence of the master station was often not welcome in the small forward command posts favored by maneuver unit commanders. The BUU weighed approximately 40 pounds, a characteristic which made it understandably unpopular with many infantrymen. The BUU also had a hearty appetite for expensive lithium batteries. In a time of increasing fiscal constraints, this expense tended to limit the field exercise of PLRS in 1989 and 1990.²

Summary

The Fleet Marine Force entered the 1990s with a mixture of old and new equipment and communication organizations that had not been substantially changed in the nearly two decades since the end of the Vietnam War. Its communication personnel were adequately trained, with many of the officers and staff NCOs having experience in both aviation and ground units. Duty with joint and other service commands had also served to broaden the horizons of more senior communications officers. Modern digital communications equipment was on its way to the FMF that promised to increase both the flexibility and the capacity of units to effectively support field commanders in the contemporary joint operations environment.

Notes

Information on unit T/Os contained in this appendix is taken from the Marine Corps T/O checklist recapitulation dated 14Jan91. They include T/Os 1096M (HqCo, Infantry Regt), 1101G (HqBtry, Artillery Regt), 1883G (CommCo, Marine Div), and 3131F (CommCo, FSSG). In addition, FSSG T/Os 3211F, 3311F, 3411F, 3511F, 3561F, 3611F, and 3661F of 14Jan91 provide strength information on the communication platoons in the headquarters companies of each FSSG battalion.

* I MEF, consisting of the 1st Marine Division (1st MarDiv), the 3rd Marine Aircraft Wing (3d MAW), the 1st Force Service Support Group (1st FSSG), and the 1st Surveillance, Reconnaissance, and Intelligence Group (1st SRIG), was located at bases in Southern California. II MEF, with 2d MarDiv, 2d MAW, 2d FSSG, and 2d SRIG, was located in North and South Carolina. III MEF, forward-based in Japan and Okinawa, consisted of most of 3d MarDiv, 1st MAW, 3d FSSG, and 3d SRIG. The balance of the above fell under the 1st Marine Expeditionary Brigade, a separate standing MAGTF based in Hawaii.

1. T/Os 4886A, 4863A, and 4883A respectively.

* The other five are: offensive air support, antiair warfare, assault support, aerial reconnaissance, and electronic warfare.

** The TACC, the senior Marine air agency, serves as the command post of the commanding general. The TACC supervises and directs the activities of the tactical air operations center and the direct air support center and tasks the MAW's subordinate aircraft groups. Although there was no fixed organization to a MAW, it was expected that each would consist of one Marine fighter attack (VMFA) group, one Marine attack (VMA) group, and two helicopter groups with a mixture of heavy, medium, light, and attack helicopter (HMH, HMM, HML/A) squadrons and fixed-wing observation squadrons (VMO).

*The designation for the Deputy Chief of Staff for Command, Control, Communications, Computers, Intelligence, and Information Systems.

* Other subordinate units included the headquarters, military police, service, and motor transport companies and the division band.

* The high mobility, multi-mission, wheeled vehicle, or HMMWV, replaced the M-151 jeep in the mid-1980s.

2. Capt Erik J. Knutilla intvw, 23Jun94.