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November 1997

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Basic Operational Communications Doctrine

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LIST OF ACRONYMS/ABBREVIATIONS

A

ABNCP. Airborne command post

ACOC. Area communications operations center

ACP. Allied Communications Publication

ADMIN. Administrative office of

ADMS. Advanced digital multiplex system

ADNET. Antidrug network

ADNS. Automated digital network system

ADUA. Administrative directory user agent

AEW. Airborne early warning

AFC. Area frequency coordinator

AIG. Address indicating group

AJ. Antijam

ALE. Automatic link establishment

ALM. Automatic link maintenance

AM. Amplitude modulation

AMVER. Automated mutual assistance vessel rescue

ANCC. Automated network control center

ANDVT. Advanced narrowband digital voice terminal

AOC. Air operations center

AOR. Area of responsibility

ARG. Amphibious readiness group

ASC. AUTODIN switching center

ASCM. Antiship cruise missile

ATC. Automated technical control

ATD. Actual time of departure

ATM. Asynchronous transfer mode

ATO. Air tasking order

AUSCANNZUKUS. Australia, Canada, New Zealand, United Kingdom, United States

AUTODIN. Automated digital network

AW. Air warfare

AWACS. Airborne warning and control system

B

BCA. Broadcast control authority

BCIXS. Battle cube information exchange system

BCO. Base communications office

BCS. Broadcast control station

BGIXS. Battle group information exchange system

BKS. Broadcast keying station

BLII. Base level information infrastructure

C

C^2. Command and control

C^4I. Command, control, communications, computers, and intelligence

C4IFTW. C^4I for the warrior

CAD. Collective address designator

CAP. Channel access protocol

CASREP. Casualty report

CAT. Communications assistance team

CATF. Commander, amphibious task force

CAW. Certification authority workstation

CCC. CINC command complex

CCEB. Combined Communications-Electronics Board

CCG. Combat communications group

CCIR. International Radio Consultative Committee

CCITT. International Telephone and Telegraph Consultative Committee

CCS. Combat communications squadron

CDC. Central directory component

CEOI. Communications-electronics operating instruction

CENTCOM. Central Command

CIB. Communications information bulletin

CINC. Commander-in-chief

CINCCENT. Commander-in-Chief Central Command

CINCLANTFLT. Commander-in-Chief Atlantic Fleet

CINCPACFLT. Commander-in-Chief Pacific Fleet

CINCUSNAVEUR. Commander-in-Chief U.S. Navy Europe

CINCUSSPACECOM. Commander-in-Chief U.S. Space Command

CJCS. Chairman, Joint Chiefs of Staff

CLF. Commander, landing force

CMC. Commandant of the Marine Corps

CMR/T. Crypto/modem/receiver/transmitter

CMS. COMSEC material system

CNO. Chief of Naval Operations

COMMARFOR. Commander, Marine Corps Forces

COMMDET. Communications detachment

COMNAVCOMTELCOM. Commander, Naval Computer and Telecommunications Command

COMNAVFOR. Commander, Naval Force

COMNAVMETOCCOM. Commander, Naval Meteorology and Oceanography Command

COMNAVSECGRU. Commander, Naval Security Group

COMNAVSPACECOM. Commander, Naval Space Command

COMPACMISTESTCEN. Commander, Pacific Missile Test Center

COMSC. Commander, Military Sealift Command

COMSEC. Communications security

COMSPAWARSYSCOM. Commander, Space and Naval Warfare Systems Command

COMSUBLANT. Commander, Submarine Force U.S. Atlantic Fleet

COMSUBPAC. Commander, Submarine Force U.S. Pacific Fleet

COMUSNAVCENT. Commander, U.S. Naval Forces Central Command

CONOPS. Concept of operations

CONPLAN. Concept plan

CONUS. Continental United States

COTS. Commercial off-the-shelf

CPX. Command post exercise

CRAT. Communications readiness assessment team

CSS. Central security service

CTAPS. Contingency theater automated planning system

CTF. Commander, task force

CUDIXS. Common user digital information exchange subsystem

CVBG. Carrier battle group

CVSD. Continuously variable slope Delta

D

DAMA. Demand assigned multiple access

DASN/C^{4}I/EW/SPACE. Deputy Assistant Secretary of the Navy for C^{4}I, EW, and Space

DDN. Defense data network

DEA. Drug Enforcement Administration

DF. Direction finding

DII. Defense information infrastructure

DIRNSA. Director, National Security Agency

DISA. Defense Information Systems Agency

DISN. Defense information system network

DITCO. Defense Information Technology Contracting Organization

DMR. Digital modular radio

DMS. Defense message system

DNI. Director of Naval Intelligence

DOC/NTIA. Department of Commerce/National Telecommunications and Information Agency

DOD. Department of Defense

DON. Department of the Navy

DON/INPO. Department of the Navy Information Network Program Office

DPVS. Distributed PLA verification system

DSA. Directory system agent

DSCS. Defense satellite communications system

DSN. Defense switched network

DSSCS. Defense special security communications system

DTS. Diplomatic telecommunications system

DUA. Directory user agent

DWTS. Digital wideband transmission system

E

EA. Electronic attack

EAC. Echelon above corps

EAM. Emergency action message

EAP. Emergency action plan

EASTPAC. Eastern Pacific

ECCM. Electronic counter-countermeasure

ECM. Electronic countermeasure

EEFI. Essential elements of friendly information

EFP. Expeditionary force package

EHF. Extremely high frequency

ELINT. Electronic intelligence

ELSEC. Electronic security

EMC. Electromagnetic compatibility

EMCON. Emission control

EMI. Electromagnetic interference

ETA. Estimated time of arrival

ETD. Estimated time of departure

EW. Electronic warfare

F

FAA. Federal Aviation Administration

FAAB. Frequency Allocation Advisory Board

FCC. Federal Communications Commission

FEMA. Federal Emergency Management Agency

FLTBCST. Fleet broadcast

FLTSAT. Fleet satellite

FM. Frequency modulation

FMF. Fleet Marine Force

FMFM. Fleet Marine Force Manual

FSC. Fleet satellite communications

FSK. Frequency shift keying

FTOC. Fleet telecommuniations operations center

FTP. File transfer protocol

FTS. Federal telecommunications system

G

GBS. Global broadcast service

GCC. Global control center

GCCS. Global command and control system

GDIP. General defense intelligence program

GENSER. General service

GFE. Government furnished equipment

GLOBIXS. Global information exchange system

GMDSS. Global maritime distress and safety system

GMF. Ground mobile force

GOTS. Government off-the-shelf

GPO. Government Printing Office

H

HEMP. High altitude electromagnetic pulse

HFRG. High frequency radio group

HSFB. High speed fleet broadcast

I

ICDB. Integrated communications data base

IDSN. Indirect DSN (also I-DSN)

IFF. Identification friend or foe

IFRB. International Frequency Board

INMARSAT. International maritime satellite

IRAC. Interdepartment Radio Advisory Committee

ISABPS. Integrated submarine automated broadcast processing system

ISDN. Integrated services digital network

ITP. Integrated terminal program

ITU. International Telecommunications Union

IUSS. Integrated undersea surveillance system

J

J3. Operations directorate of any joint command (i.e., JCS J3)

JANAP. Joint Army-Navy-Air Force Publication

JBS. Joint broadcast system

JCP. Joint communications plan

JCS. Joint Chiefs of Staff

JCSE. Joint communications support element

JDISS. Joint deployable intelligence support system

JFMO. Joint frequency management office

JFMOLANT. Joint Frequency Management Office Atlantic

JFMOPAC. Joint Frequency Management Office Pacific

JFP. Joint frequency panel

JFTOC. Joint fleet telecommunications operations center

JINTACCS. Joint interoperability of tactical command and control system

JMCIS. Joint maritime command information system

JMCOMS. Joint maritime communications strategy

JMINI. Joint MILSATCOM network integrated control system

JMTSS. Joint maritime tactical switching system

JROC. Joint required operational capability

JSOTF. Joint special operations task force

JSTARS. Joint surveillance and attack radar system

JTF. Joint task force

JTG. Joint task group

JTIDS. Joint tactical information distribution system

JTT. Joint tactical terminal

JWICS. Joint worldwide intelligence communications system

JWID. Joint warrior interoperability demonstration

L

LAMPS. Light airborne multipurpose system

LAN. Local area network

LANTFLT. Atlantic Fleet

LCC. Local control center

LDR. Low data rate

LEO. Law enforcement operations

LIMDIS. Limited distribution

LOA. Low observable antenna

LOGREQ. Logistics request

LOS. Line of sight

LPD. Low probability of detection

LPI. Low probability of intercept

LRI. Limited range of intercept

LSTDM. Low speed time division multiplexer

M

MAGTF. Marine air-ground task force

MARFOR. Marine Corps forces

MARS. Military affiliate radio system

MCS. Message conversion system

MCWP. Marine Corps Warfare Publication

MDR. Medium data rate

MDU. Mission data update

MERS. Multifunction electromagnetic radiating system

MEU. Marine expeditionary unit

MFI. Multifunction interpreter

MIJI. Meaconing, intrusion, jamming, and interference

MILDEP. Military department

MILSTAR. Military strategic and tactical relay system

MLA. Mail list agent

MLS. Multilevel security

MMBA. Multibeam, multimission broadband antenna

MODEM. Modulator-demodulator

MOP. Memorandum of policy

MOVREP. Movement report

MPA. Maritime patrol aircraft

MS. Message store

MSB. Message screening board

MSC. Military Sealift Command

MSCEUR. MSC Europe

MSCFE. MSC Far East

MSCO. MSC office

MSK. Minimum shift keying

MTA. Message transfer agent

N

NASA. National Aeronautics and Space Administration

NATO. North Atlantic Treaty Organization

NAVCOMMAREA. Naval communications area

NAVCOMPARS. Naval communications processing and routing system

NAVCOMTELSTA. Naval computer and telecommunications station

NAVEMSCEN. Naval Electromagnetic Spectrum Center

NAVFOR. Naval forces

NAVMACS. Naval modular automated communications subsystem

NAVSECGRU. Naval Security Group

NAVSOF. Naval special operations forces

NBSV. Narrowband secure voice

NCA. National Command Authorities

NCS. National communications system

NCTAMS. Naval computer and telecommunications area master station

NCTS. Naval computer and telecommunications system

NDI. Non-developmental item

NEF. Naval expeditionary forces

NESP. Navy EHF SATCOM program

NFAF. Naval fleet auxiliary force

NII. Navy information infrastructure

NIPRNET. Sensitive-but-unclassified (N) internet protocol router network

NITES. Naval command and control system-afloat (NCCS-A) integrated tactical environmental subsystem

NMCC. National Military Command Center

NOW. Navy order wire

NSA. National Security Agency

NTS. Naval telecommunications system

NWP. Naval Warfare Publication

O

O&M. Operations and maintenance

OMB. Office of Management and Budget

ONI. Office of Naval Intelligence

OPDEC. Operational deception

OPLAN. Operations plan

OPORD. Operations order

OPREP. Operational report

OPSEC. Operational security

OSD. Office of the Secretary of Defense

OTAM. Off the air monitor

OTAR. Over the air rekey

OTAT. Over the air transfer

OTC. Officer-in-tactical command

OTCIXS. Officer-in-tactical command information exchange subsystem

OTH-T. Over the horizon targeting

OTO. Operator to operator

P

P3I. Preplanned product improvements

PACFLT. Pacific Fleet

PC. Personal computer

PCMCIA. PC memory card international association

PCS. Personal communications system

PLA. Plain language address

POD. Plan of the day

POP. Point of presence

PREPO. Prepositioning force

PSK. Phase shift keying

PSN. Public switched network

PUA. Profiling user agent

R

R&D. Research and development

RAFAX. Radio facsimile

RATT. Radio teletype

RCC. Regional control center

RRF. Ready Reserve force

S

SAC. Supreme Allied Command

SACCS. Ship automated communications control system

SACLANT. Supreme Allied Commander, Atlantic

SAR. Search and rescue

SATCOM. Satellite communications

SBU. Sensitive but unclassified

SCI. Sensitive compartmented information

SCSS. Shipboard communication switching system

SECNAV. Secretary of the Navy

SEP. Service entry point

SEW. Space and electronic warfare

SHF. Super high frequency

SI. Special intelligence

SID. Subscriber identification

SIGINT. Signals intelligence

SIGSEC. Signal security

SINCGARS. Single channel ground and airborne radio system

SIPRNET. Secret internet protocol router network

SLVR. Submarine LF/VLF VME bus receiver

SMC. Satellite management center

SMF. Special mission force

SMSF. Special mission support force

SMTP. Simple mail transfer protocol

SOC. Special operations capable

SOLAS. Safety of life at sea

SOP. Standard operating procedure

SOPA. Senior officer present afloat/ashore

SORTS. Status of resources and training systems

SOSUS. Sound surveillance system

SPECAT. Special category

SPECOPS. Special operations

SPINTCOMM. Special intelligence communications

SRCS. Shore remote control system

SSA. Shared signaling access or SATCOM signal analyzer

SSBN. Nuclear powered ballistic missile submarine

SSIC. Standard subject identification code

SSIXS. Submarine satellite information exchange subsystem

SSN. Nuclear powered attack submarine

STEL. Stanford telecommunications

STEP. Standardized tactical entry point

STU. Secure telephone unit

STW. Strike warfare

SUBOPAUTH. Submarine operating authority

SURTASS. Surveillance towed array sensor system

SUW. Surface warfare

T

TACAMO. Take charge and move out

TACAN. Tactical air navigation

TACC. Theater Army component command

TACINTEL. Tactical intelligence subsystem

TACMAN. Tactical manual

TACS. Theater air control system

TACTERM. Tactical terminal

TADIXS. Tactical data information exchange subsystem

TAGS. Theater air-ground system

TCC. Tactical command center

TCF. Technical control facility

TCP/IP. Transmission control protocol/internet protocol

TDM. Time division modem

TDMA. Time division multiple access

TEMPALT. Temporary alteration

TESS(3). Tactical environmental support system

TFMS. Tactical frequency management system

TRAP. TRE and related applications

TRE. Tactical receive equipment

TRITAC. Triservices tactical communications

TTY. Teletype

TVRO. Television receive only

TYCOM. Type commander

U

UCMJ. Uniform Code of Military Justice

U.K. United Kingdom

UA. User agent

UFO. UHF follow-on (satellite system)

USAISC. U.S. Army Information Systems Command

USCG. U.S. Coast Guard

USCINCEUR. Commander-in-Chief, European Command

USCINCACOM. Commander-in-Chief, Atlantic Command

USMCEB. U.S. Military Communications-Electronic Board

USMTF. U.S. message text format

USSPACECOM. U.S. Space Command

USSTRATCOM. U.S. Strategic Command

USTRANSCOM. U.S. Transportation Command

USW. Under sea warfare

USWOC. USW operations center

V

VERDIN. VLF digital information network

VIXS. Video information exchange system

VME. Versa module European

VOR. VHF omnidirectional range

VTC. Video teleconferencing

W

WAN. Wide area network

WESTPAC. Western Pacific

WHCA. White House Communications Agency

PREFACE

NWP 6-01 (Rev. A), BASIC OPERATIONAL COMMUNICATIONS DOCTRINE, is designed as a guide to provide the available information that is essential for ensuring naval commanders make optimum use of the communications capabilities available to them. This publication should be used in conjunction with NDP 6 and JCS Pub 6.

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Part I — Communications Organization

CHAPTER 1

Operational Control of Naval Communications

1.1 MISSION OF U.S. NAVY COMMUNICATIONS

The mission of naval communications, under the Copernicus Architecture, is to establish a Navy C^4I architecture for the Space and Electronic Warfare mission, wherein the tactical commander is the center of information flow and in control of deciding his information needs to support mission execution. This user-centered approach provides the tactical commander control through information-pull at his end rather than data-push at the shore end. The four pillars of the Copernicus framework, discussed in depth in Chapter 20, tie together the command and control process of the Navy tactical commander afloat, the joint task force commander, the numbered fleet commander, and others with the CINC ashore. These pillars are the:

1. GLOBIXS
2. CCC
3. TADIXS
4. TCC.

A communications architecture is required that provides seamless and reliable switching and transfer of large volumes of voice, video, data, and imagery information between ship and shore and to the NCA.

1.2 ROLE OF NATIONAL COMMAND AUTHORITIES

The vision driving C^4I for the warrior, corporate information management, enterprise integration, and the DII is derived from high-level policy and vision statements outlined in the National Security Strategy, the National Military Strategy, the Joint Planning Document, and the Defense Planning Guidance. Functional strategic plans are developed to identify long-term area goals and task the appropriate community to develop functional implementation plans that provide capabilities to the warfighters' mission, support forces, and all of DOD.

1.3 THE OPERATIONAL ROLE OF THE JOINT CHIEFS OF STAFF

The JCS functions as the immediate military advisory staff of the Secretary of Defense, serving in the chain of command that extends from the President to the Secretary of Defense, through the JCS, to the commanders of the unified commands. JCS provides guidance to the CINCs to:

1. Accomplish tasks and missions based on current military capabilities
2. Apportion resources based on military capabilities resulting from completed programs, budget actions, and intelligence assessments
3. Task development of OPLANs, CONPLANs, and functional plans for regional contingencies.

J3 collaborates and coordinates with the Army, Navy, Marine Corps, and Air Force on communications requirements of the commanders of unified and specified commands, DISA, other DOD agencies, and on those service matters that affect more than one Service. When approved by the CJCS, the JCSE provides support to the headquarters of the JTF and JSOTF. This support includes installation, operation, and maintenance of the facilities and, when required, installation, operation, and maintenance of satellite terminals at Service component and supported or supporting CINC or Allied headquarters. CJCS MOP 3 limits the JCSE to providing no more than 45 days of communications support to the CJTF. The Joint Staff validates joint requirements for C^4I systems. J6, assisted by DISA, certifies interoperability aspects of mission need statements and joint operational

requirements documents for C^4I systems. When the total requirement for communications resources exceeds the capability of any one CINC or Service, the CINC will send a request to the Joint Staff for CJCS-controlled tactical communications equipment in accordance with CJCS MOP 3.

UHF and SHF satellite connectivity between the CINC and CJTF is often provided initially by JCSE employment of joint crisis management capability UHF level one systems and/or CJCS-controlled ground mobile forces satellite systems. If CJCS commits the JCSE to support the CINC's requirements and shortfalls persist, the CINC can request additional assets from the Military Departments through their Service components and examine the possibility of using commercial systems. This concept of resourcing applies to HF, satellite, and terrestrial multichannel requirements.

1.4 CONTROL OF DEFENSE INFORMATION SWITCHING NETWORK

The Director, DISA, is responsible for the overall management of the DISN. Access to the DSN, AUTODIN (to be replaced by DMS), and the DISN is provided through the DSCS satellite system, standardized tactical entry point, or other DSCS Service entry points. DISA provides management of, and employs communications resources at, designated DISN entry stations and gateways to terminate long-haul tactical trunks and circuits from the joint operations area. The appropriate DISA area communications operation center closely supervises the allocation, rerouting, and restoration of DISN channels and circuits.

1.5 ROLE OF UNIFIED COMMANDERS

The Goldwater-Nichols Act of 1987 led to the strengthening of the role of the unified commanders in the command of forces for each of the major geographic areas and mission functions. This ensured that each unified commander could exercise direct control over forces assigned by individual Service components for a specified mission. It also shortened the chain of command between the NCA and the flag or general officer responsible for a geographic area. Each unified commander has a Service component that equips, trains, and provides forces to the unified commander to fill requirements set by the NCA. Unified commanders organize forces from assigned components into JTFs for each particular mission.

The unified commanders each have communications requirements that must be met to support their operational missions. These requirements include assignment and control of frequencies, establishment and control of terrestrial connectivity, and space-based (satellite) resources.

1.6 CONTROL OF AREA ASSETS

In the early 1990s, the JCS took the first steps toward shifting control of communication assets to the unified commanders by issuing MOP 37. Prior to the issue of MOP 37, satellite communication channels belonged to the Service that purchased and launched the satellite (i.e., FLTSAT to the Navy, AFSAT to the Air Force, and DSCS to the Army Signal Corps). MOP 37 shifted responsibility for satellite communications asset assignment in support of unified commanders to the Joint Staff, J6. This allows for more efficient use of these assets and provides the unified commander with the flexibility to more closely meet individual Service needs. The unified commanders have the option of further assigning control of each satellite resource to their Service components or retaining scheduling control. MOP 37 designates priorities for each use of a satellite resource. The unified commanders use this list to schedule resources. In most cases, resources that were previously used by Service components for mission support, such as CUDIXS and the FLTBCST, remain assigned to that purpose but must be revalidated every two years. Each use of a satellite resource has an ICDB number assigned to it that shows it is a valid use. ICDBs are discussed in more detail in Chapter 16 and Appendix E.

The control of area assets by the unified commander also extends to tactical and long-range radio frequencies and navigation aids used by the military. In 1995, USCINCACOM took over operational control of the JFMOLANT. Similar actions are being taken by the other unified commanders.

1.7 ROLE OF FLEET CINCS AND NUMBERED FLEET COMMANDERS

Each unified commander has Service component commanders for each of the Services. Fleet CINCs serve as the Navy component commanders. There are three fleet CINCs: CINCLANTFLT, CINCPACFLT, and CINCUSNAVEUR. There are also Navy component commanders that are not fleet CINCs, such as COMUSNAVCENT for CINCCENT or COMNAVSPACECOM for USSPACECOM. In communications, the Fleet CINC is responsible for the operational control of naval telecommunications activities that support the naval organizations assigned to the unified CINC. Additionally, the Fleet CINC ensures naval telecommunications shore support to the unified CINC, as required. Fleet CINCs also validate requests for satellite resources from Navy units that are not currently assigned to a joint operation.

While the Fleet CINC is generally not an operational commander but a force provider, the numbered fleet commanders, e.g., COMSEVENTHFLT, COMTHIRDFLT, are operational commanders. These fleet commanders can fill several roles. Depending on the size of the mission, they may be assigned as a CJTF or as a Navy component commander of a JTF. In either case, they are under the operational control of the unified CINC. As such, the numbered fleet commanders must work with the Fleet CINC and the unified CINC to arrange and provide communications support.

1.8 NAVAL COMPUTER AND TELECOMMUNICATIONS AREA MASTER STATION

There are three NCTAMS in the Navy — NCTAMS EASTPAC, LANT, and MED. Among them, they provide telecommunications control of the three NAVCOMMAREAs that encompass the globe. The NAVCOMMAREAs and their responsible NCTAMS are:

1. PAC — NCTAMS PAC, Wahiawa, HI
2. LANT — NCTAMS LANT, Norfolk, VA
4. MED — NCTAMS MED, Naples, IT.

A NCTAMS coordinates all naval telecommunications services for a geographic area and is operationally responsible to the Fleet CINC. A NCTAMS exercises day-to-day operational management of communications for the fleet and, in some cases, a unified CINC. They provide such services as the fleet broadcast, message forwarding to fleet and deployed units via NAVCOMPARS, and operational satellite terminals for FLTSAT, UFO, DSCS, and MILSTAR satellite systems. They also provide telephone services for naval installations in their areas when designated BCO.

1.9 NAVAL COMPUTER AND TELECOMMUNICATIONS STATION

These activities, subordinate to the NCTAMS and located throughout the various NAVCOMMAREAs, provide many of the same services as a NCTAMS and may be as large as a NCTAMS; however, they exercise control over smaller portions of the NAVCOMMAREA and do not include a JFTOC (formerly known as an FTOC). Specific capabilities for NAVCOMTELSTAs can be found in each command's mission and function statement and in the NCTAMS CIBs.

CHAPTER 2

DOD Functional Communications Organization

2.1 OFFICE OF THE SECRETARY OF DEFENSE

The National Security Act of 1947 established the DOD to include the OSD and the JCS, the Military Departments and the Military Services within these departments, unified commands, and such other agencies as the Secretary of Defense establishes to meet specific requirements.

2.1.1 Assistant Secretary of Defense for C^4I. The Assistant Secretary of Defense for Command, Control, Communications, Computers and Intelligence is the principal staff assistant to the Secretary of Defense on C^4I matters. He is the principal assistant to the Secretary of Defense for the NCS and has primary staff responsibility in the OSD for worldwide military command and control, setting policy for the infrastructure, and sustaining base, deployed, and enterprise elements.

2.1.2 United States Military Communications-Electronics Board. The USMCEB coordinates military communications-electronics matters within the DOD and NCS and provides guidance, direction, advice, and assistance on these matters for components of DOD. The USMCEB prepares JANAPs and participates in developing ACPs in coordination and cooperation with appropriate Allied nations.

2.2 FUNCTIONAL ROLE OF JOINT CHIEFS OF STAFF

JCS ensures that operating forces are provided with the most efficient and reliable communications capabilities possible. The Joint Staff validates joint requirements for C^4I systems. J6, assisted by DISA, certifies interoperability aspects of Mission Need Statements and Joint Operational Requirements Documents for C^4I systems. When the total requirement for communications resources exceeds the capability of any one CINC or Service, the CINC will send a request to the Joint Staff for CJCS-controlled tactical communications equipment in accordance with CJCS MOP 3.

2.3 ROLE OF DISA

DISA, formerly known as DCA, is responsible for the management of the DOD long haul communications infrastructure known as the DISN. This includes the DDN, DSN (which absorbed AUTOVON), DMS (which is replacing AUTODIN), and DSCS. DISA is also the contracting agency for long haul communications services that are required for special purposes such as exercises, military operations, and intelligence support.

2.3.1 DISN System Management. DISN is the family of networks that will carry all digitized information in support of DOD. This includes voice, video, imagery, narrative data, and any other information that can be digitized and transported. DISN is planned to evolve to four separate networks, defined by the classification level at which they operate.

1. DISN(U) — currently called NIPRNET, carries unclassified information.

2. DISN(S) — currently called SIPRNET, carries Confidential and Secret information.

3. DISN(TS) — to be called DSNET 2 and planned to carry Top Secret and SPECAT information. This requirement is currently being satisfied by GCCS-T.

4. DISN(TS/SCI) — to be called DSNET 3 and planned to carry SCI. This requirement is currently satisfied by the JWICS data network.

Management of the DISN consists primarily of setting standards, monitoring performance, and contracting for the installation and upgrade of the DISN

backbone. Each service bears the responsibility for accessing the DISN and extending it to the appropriate users. This includes acquisition of the required switching and terminal equipment. DISN access and service can be extended via satellite to ships when underway and through high-capacity, pierside, landline connections, both telephone and data, when in port.

When the DISN is fully implemented it will also provide transport backbone services for the DMS. DISN will carry DMS organizational and individual E-mail much like AUTODIN currently carries message traffic between installations. Each Navy installation will have a communications activity that connects the DISN POP, or SEP as it is becoming known, to the end-users at the installation via Navy operated and maintained BLII. BLII is a Navy effort to upgrade and modernize its present inter- and intrabase information transfer infrastructure, replacing antiquated twisted copper wire and analog switches with fiber optic backbones and other switching and routing equipment that will accommodate and maximize the information transfer capabilities provided by state-of-the-art protocols and transport methods, i.e., X.400, TCP/IP, ATM, ISDN, etc.

2.4 ROLE OF THE DEPUTY ASSISTANT SECRETARY OF THE NAVY FOR C^{4}I/ELECTRONIC WARFARE AND SPACE PROGRAMS

The DASN C^{4}I/EW/Space serves on the staff of the Assistant Secretary of the Navy for Research, Development, and Acquisition. Within the Department of the Navy, he has the primary responsibility for setting Navy and Marine Corps policy on C^{4}I and Space Systems matters, such as infrastructure and Information Systems Management Systems integration. The Department of the Navy Information Network Program Office is also under the auspices of DASN C^{4}I/EW/Space.

DON INPO provides leadership, direction, and technical expertise for the Secretary of the Navy's initiative to consolidate all departmental information technology resources. The Secretary's goal is to create, from existing Navy and Marine Corps networks, a Department-wide, standards-based, interoperable infrastructure. DON INPO is also the Navy's primary interface with DOD's Single Agency Manager.

2.4.1 Role of Chief of Naval Operations (N2 and N6/N9). The control and use of communications is a function of command. CNO, reporting to SECNAV, exercises overall authority over DON communications except where such responsibility rests with the Commandant of the Marine Corps. Naval forces are tailored to support a wide spectrum of missions from single ship to CVBG to joint/combined operations. In all cases, naval forces operate in support of specified joint warfare capabilities as required by the CJCS. CNO N6 is tasked to provide the warfighter with rapid, accurate, reliable, and secure transfer of information in support of naval, joint, and combined forces.

2.4.2 Commander, Naval Computer and Telecommunications Command. COMNAVCOMTELCOM operates and maintains the worldwide NCTS, formerly known as the NTS. COMNAVCOMTELCOM maintains configuration management and control of the NCTS, a complex array of equipment and subsystems located ashore, which provides a telecommunications network for the operations, command and control, and administration of strategic and tactical naval units and missions. It also serves as the O&M agent for those elements of the DISN that transition through Navy TCFs. In some instances, COMNAVCOMTELCOM functions as the Central Design Agency for telecommunications in the DON, performing configuration and lifecycle management of Navy automated message handling and Navy DMS transitional hardware and software system components.

2.4.3 Commander, Space and Naval Warfare Systems Command. COMSPAWARSYSCOM is responsible for the design, engineering, acquisition, installation, implementation, configuration management, and lifecycle support of DON C^{4}I systems. As such, COMSPAWARSYSCOM implements the Navy's portion of the JCS C^{4}IFTW concept and coordinates with the fleet and other systems commands in order to provide an integrated approach to installation planning and enhancement of C^{4}I capabilities. COMSPAWARSYSCOM's long-term goal is to provide the warfighter with the C^{4}I tools necessary to meet current and emerging challenges within present and projected fiscal constraints. Additionally, COMSPAWARSYSCOM continues to progress toward the implementation of naval C^{4}I systems that are fully interoperable with a single joint unified warfighting system.

2.4.4 Commander, Naval Security Group. COMNAVSECGRU exercises authority over the performance of cryptologic systems, coordinates the execution of approved cryptologic programs, and formulates and administers the portion of the naval COMSEC program associated with OPSEC under the authority of CNO.

2.4.5 Commander, Naval Space Command. The Naval Space Command provides essential information and capabilities to ashore and afloat naval forces using the medium of space and its potential for operating surveillance, navigation, communications, environmental, and information systems. It advocates naval

warfighting requirements in the joint arena and advises, supports, and assists the Navy and Marine Corps through the development of space plans, programs, budgets, policies, concepts, and doctrines.

Naval Space Command's functions include the following:

1. Performing those operational tasks necessary to support USCINCSPACE missions.

2. Coordinating directly with the Fleet CINCs and the Fleet Marine Force on operational space matters.

3. Providing operational systems management of FLTSATCOM satellites, UHF follow-on satellite program satellites, and any other space systems, either owned or commercially leased for which the DON is the system manager in accordance with JCS MOP 37.

4. Acting as the principal naval authority for coordination of matters related to operational management of the Military Communications Satellite System.

2.4.6 Commandant of the Marine Corps. CMC is responsible for the overall readiness and performance of the Marine Corps. His responsibility to CNO encompasses the readiness of those elements of the operating forces of the Marine Corps assigned to the operating forces of the Navy, including the responsibilities for organic communications.

2.4.7 Relationship between OPNAV and CMC. CNO validates CMC requirements and directs implementation by COMSPAWARSYSCOM for major Marine Corps commands ashore, with the exception of equipment organic to the FMF.

2.5 U.S. ARMY COMMUNICATIONS

The United States Army's function is to engage in ground combat during times of war or provide other support, such as peacekeeping or disaster relief during other peacetime operations, as assigned. Army component operations are inherently joint and may be multinational. Air and naval support can be used to enhance the effectiveness and tempo with which ground forces accomplish their mission. The Army, as part of the joint team, can be used by national leaders to compel an adversary to accede to the will of the United States, to deter opponents from actions inimical to the United States, and to reassure U.S. Allies, demonstrate U.S. capabilities, promote regional stability, and contribute to the nation's ability to influence world events.

2.5.1 Power Projection in an Information Age. As the United States moved from a Cold-War strategy of containment to a post Cold-War strategy as contained in the National Security Strategy of Engagement and Enlargement dated July 1994, the Army also changed to execute this new strategy and prepare itself for the challenges of the 21st century. The Army transformed itself from a forward-positioned Cold-War army to a power projection force based largely in the United States; from a threat-based force to a capabilities-based force; from an Army of 18 active divisions to one of 12 (soon to be 10) active divisions; from an Army of 770,000 active component soldiers in fiscal year 1989 to one of 541,000 in fiscal year 1994; and, perhaps most importantly, from an Army with roots in the industrial age to an Army actively exploring the promise of the information age.

2.5.1.1 Strategic Mobility. The Army's power projection force relies on strategic sea and airlift to move rapidly to any place on the globe. The United State's strategic mobility capabilities are hinged on a critical triad consisting of pre-positioned unit equipment, strategic sealift and strategic airlift, supported by world-class power projection installations (Figure 2-1). The pre-positioned equipment is distributed into strategic common user stockpiles based on requirements for a scenario of two nearly simultaneous major regional conflicts.

2.5.1.2 Force XXI. Restructuring the Army into a 21st century fighting force for information age warfare can only be achieved by ensuring the Army's modernization vision of land force dominance is attained. That vision is supported by five modernization objectives: rapidly project and sustain forces, protect committed forces, win the information war, conduct precision strikes, and dominate the maneuver battle. Force XXI is the Army's process for realizing its vision. Emerging C^4I digital-based information technologies will create a synergistic effect among weapons and organizations, significantly enhancing the Army's capabilities to exploit information increasing lethality, survivability, tempo of operations, situational awareness, and command and control. To support the National Military Strategy, the Force XXI Army must be rapidly tailorable, rapidly expandable, strategically deployable, and effectively employable as part of a joint and multinational team.

2.5.2 Army Communications Infrastructure. The Army communications organizational structure extends from the Service headquarters level down

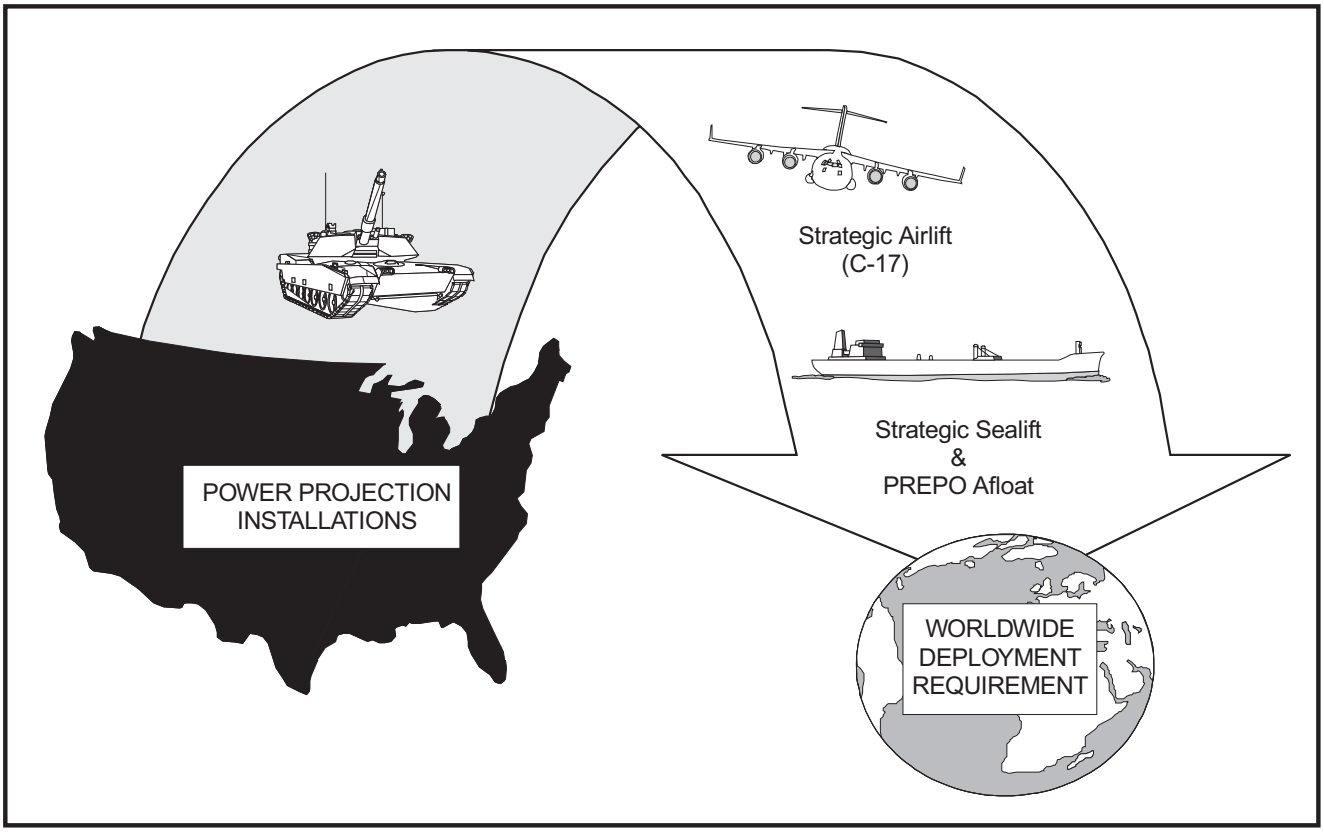

Figure 2-1. The Strategic Mobility Program

to the Army division and separate combat brigades. At the Department of the Army, the Director of Information Systems for Command, Control, and Communications is responsible for the overall planning, programming, and budgeting of Army communications/information systems that support both strategic and tactical requirements worldwide (Figure 2-2). This responsibility includes those DISN facilities that are assigned to the Army for engineering, installation, operation, and maintenance.

The Army communications organizations are designed around Army strategic missions as assigned by the Joint Strategic Capabilities Plan and the Department of the Army, and the tactical communications required to support deployed Army forces from the command level down to the smallest unit. Strategic communications are designed to support the Army mission of operating and maintaining assigned portions of the DISN worldwide. Additionally, in Europe, the Pacific, and the continental United States, the mission is to provide Army forces and other Services with conductivity into the DISN through Army communications systems and voice and message switches. Tactical communications in support of all Army forces are provided by tactical mobile communications units from separate signal brigades that provide communications in support of Army and other non-Army units. Support to corps, divisions, and below is provided by organic signal brigades and battalions designed to meet the operational requirements of their units.

2.5.2.1 Strategic and Theater Army EAC Communications. USAISC has principal responsibility for engineering, installing, operating, and maintaining all Army DISN facilities and the communications for theater army at EAC. USAISC can be described as the Army's telephone company. It is the largest military communications/automation organization in the world. (See Figure 2-3.) Signal force projection is first priority and is USAISC's contribution to the smaller, more capable Army of the future. Forward deployed units are in direct support of CINC and deployed Army overseas operations. USAISC is prepared to support the warfighter based on requirements for a scenario of two nearly simultaneous major regional conflicts, and support operations other than war including humanitarian assistance, peacekeeping, and disaster relief. USAISC

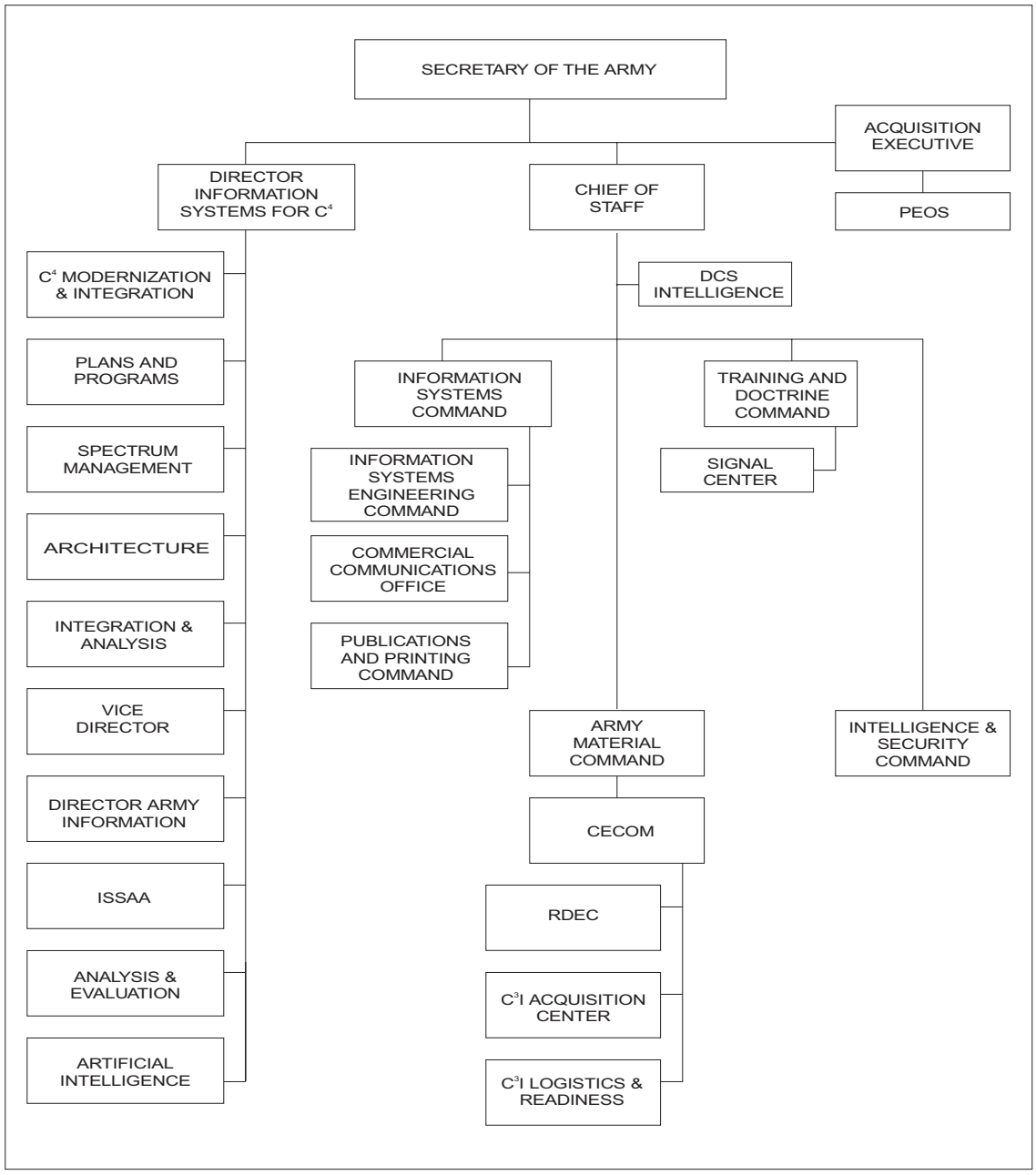

Figure 2-2. Army Communications Organizations

also has a designated JTF staff capable of quick deployment to support the National Command Authority (Figure 2-4).

2.5.2.1.1 USAISC Theater Army Component Commands. The TACCs are directly responsible to the geographic combatant commanders. Component commands include U.S. Army Europe, Heidelberg, Germany; the U.S. Army Pacific, Fort Shafter, HI; and, U.S. Army Central at Fort McPherson, GA. During war, the TACC has operational control over the signal organizations supporting the theater Army and its component commands. In this role, the TACC is responsible for all in-theater Army communications that are not organic to Army corps and smaller-sized units. The TACC operates and maintains in-theater Army DISN facilities and, in some cases, joint facilities, that are, in turn, under the management/control of the DISA ACOC.

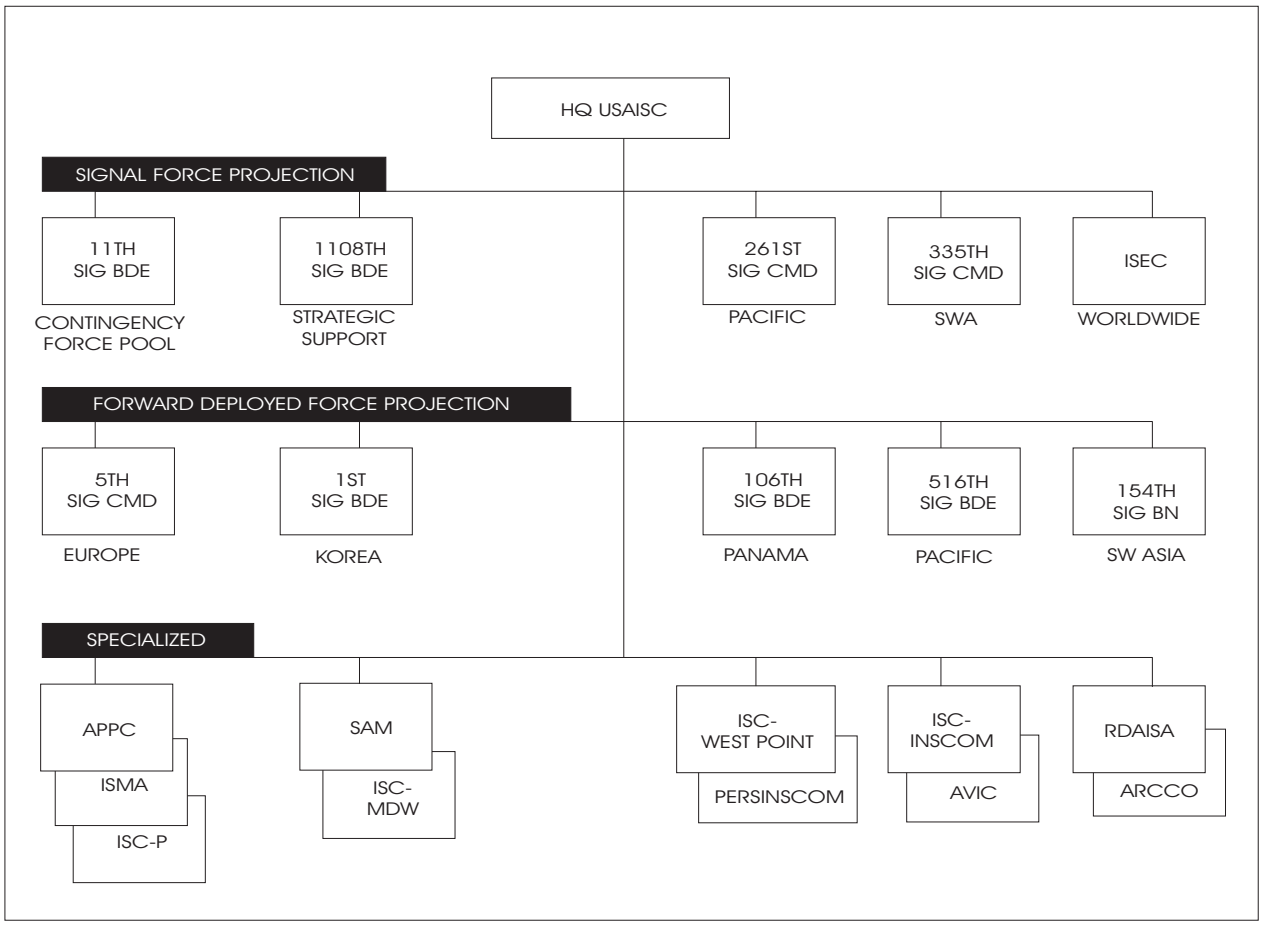

Figure 2-3. The Army's Signal Command

2.5.2.1.2 Directorate of Information Management. The Directorate of Information Management is assigned to USAISC, but is under the operational control of the garrison commander. It provides the interface between garrison installation communications and commercial or DISN communications organizations.

2.5.2.1.3 USAISC SATCOM. USAISC manages more than 20 fixed-station, satellite ground terminals worldwide. It also provides quick-reaction communications elements to be transported anywhere in the world to support contingency requirements. USAISC deployable units, like the 11th Signal Brigade, has provided command and control communications for operations such as Desert Storm, Restore Hope, and Uphold Democracy.

2.5.2.1.4 USAISC From The Sea. The USAISC 54th Signal Battalion, supporting CENTCOM and USMTM-Saudi Arabia, is instrumental in making the Navy's "From the Sea" doctrine a reality in the Southwest Asia area of responsibility. Support includes a CTAPS circuit; a STU-III compatible voice channel; wideband secure worldwide DSN access; access to DISN, tactical and Red Switch networks; and access to intelligence circuits.

This connectivity and service allow ocean-bound users to interact in near-real-time with campaign planners in the AOR as well as staff planners in CONUS. This support is continuous and has been instrumental in the full integration of naval forces into ongoing missions.

2.5.2.2 Operational and Tactical Communications. Communication units below Army level are organic to the supported command (corps, division, or separate brigade). At most Army corps, a signal brigade composed of several signal battalions supports the corps headquarters and provides communications between the corps and its subordinate commands. Each division and separate combat brigade contains an organic signal battalion or company to provide its communications systems. To command and control their designated battle space, brigade through corps commanders normally establish three command posts: division main, tactical command post, and division support command.

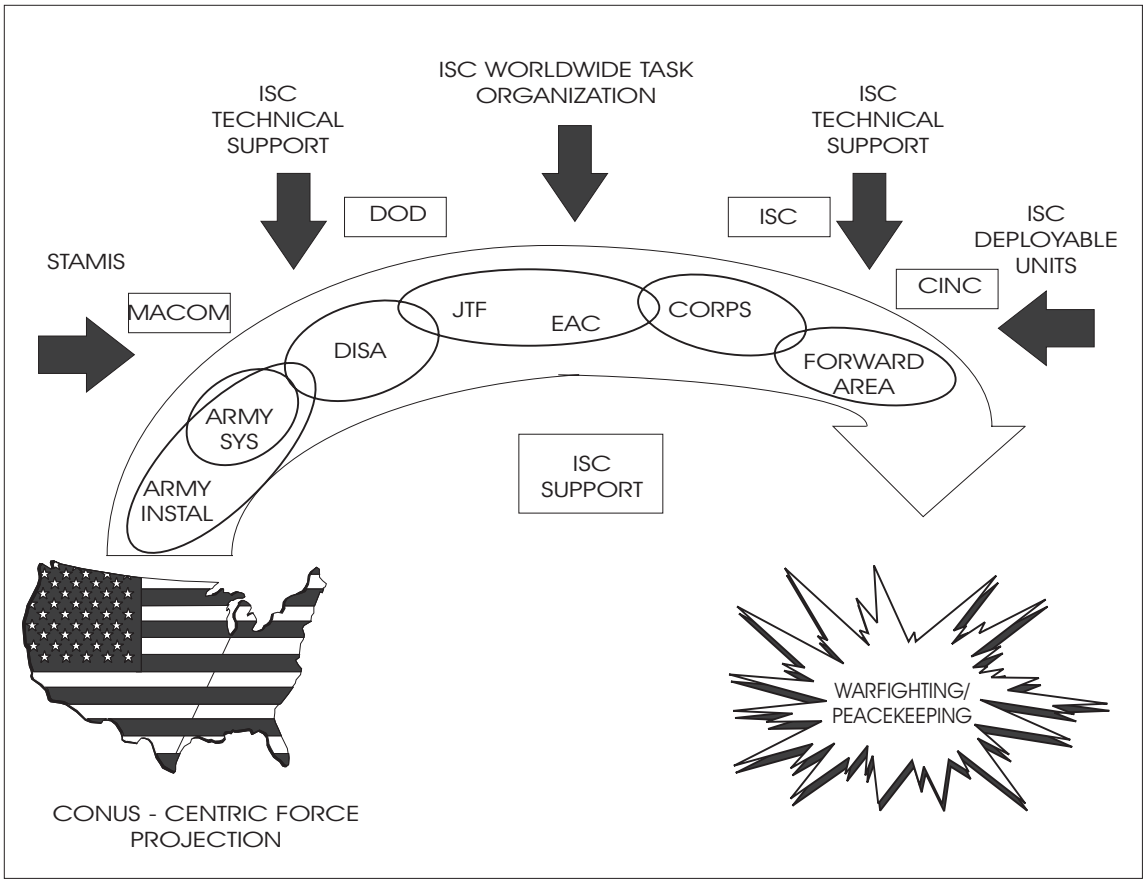

Figure 2-4. ISC Support to the Warfighter

The function of each varies; however, generic functions (Figure 2-5) are usually accomplished at each. The command post is the location from which the commander issues directives, allocates resources, monitors the pulse of battle, and synchronizes operations.

The Army uses mobile subscriber equipment to provide communications access nodes that connect the combat brigades across the division. Figure 2-6 illustrates Army tactical communications configurations. Responsibility for communications connectivity and support is from higher echelons to lower organizations, and left to right (Figure 2-7). Signal support provides fully connected paths for the effective transfer of information. For example, the Theater Signal Command (Army) support to a TA establishes connectivity to each subordinate corps. Each signal brigade organic to the subordinate corps establishes connectivity to the corps on its right flank and its corps' subordinate division. Connectivity ensures C2 even when the command post area is dispersed and the commander operates mobile.

2.6 U.S. AIR FORCE COMMUNICATIONS

The Air Force defines missions in terms of four basic roles of airspace power: airspace control, force application, force enhancement, and force support. Other military service strategies rely upon airspace capabilities e.g., the Army's ability to conduct sustained, heavy combat with low casualties.

Airspace control assures the friendly use of the environment while denying its use to an enemy. Missions include both offensive and defensive objectives to control both space (counter space missions) and air (counter air missions). Counter space missions can include operations that seek out and neutralize or destroy enemy airspace forces and ground-based defenses. Counter air

Division Main	Tactical	Division Support
PRIMARY ● Synchronize the battle ● Conduct the deep fight	PRIMARY ● Conduct the close fight	PRIMARY ● Sustain the battle ● Conduct rear area operations
SECONDARY ● Coordinate combat service support	SECONDARY ● Monitor the deep and rear fights	SECONDARY ● Serve as the backup to the main

Figure 2-5. Command Posts

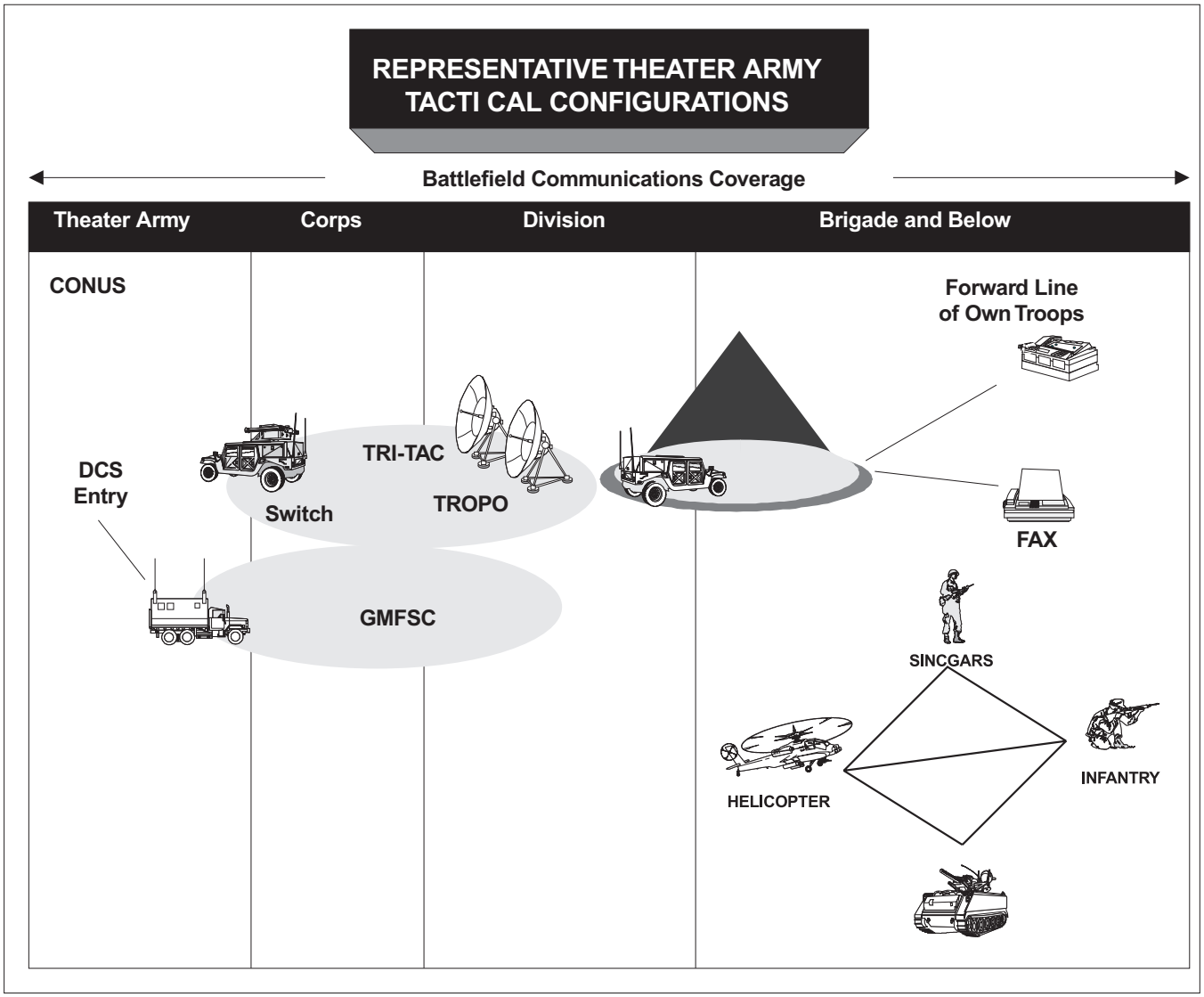

Figure 2-6. Representative Theater Army Tactical Configurations

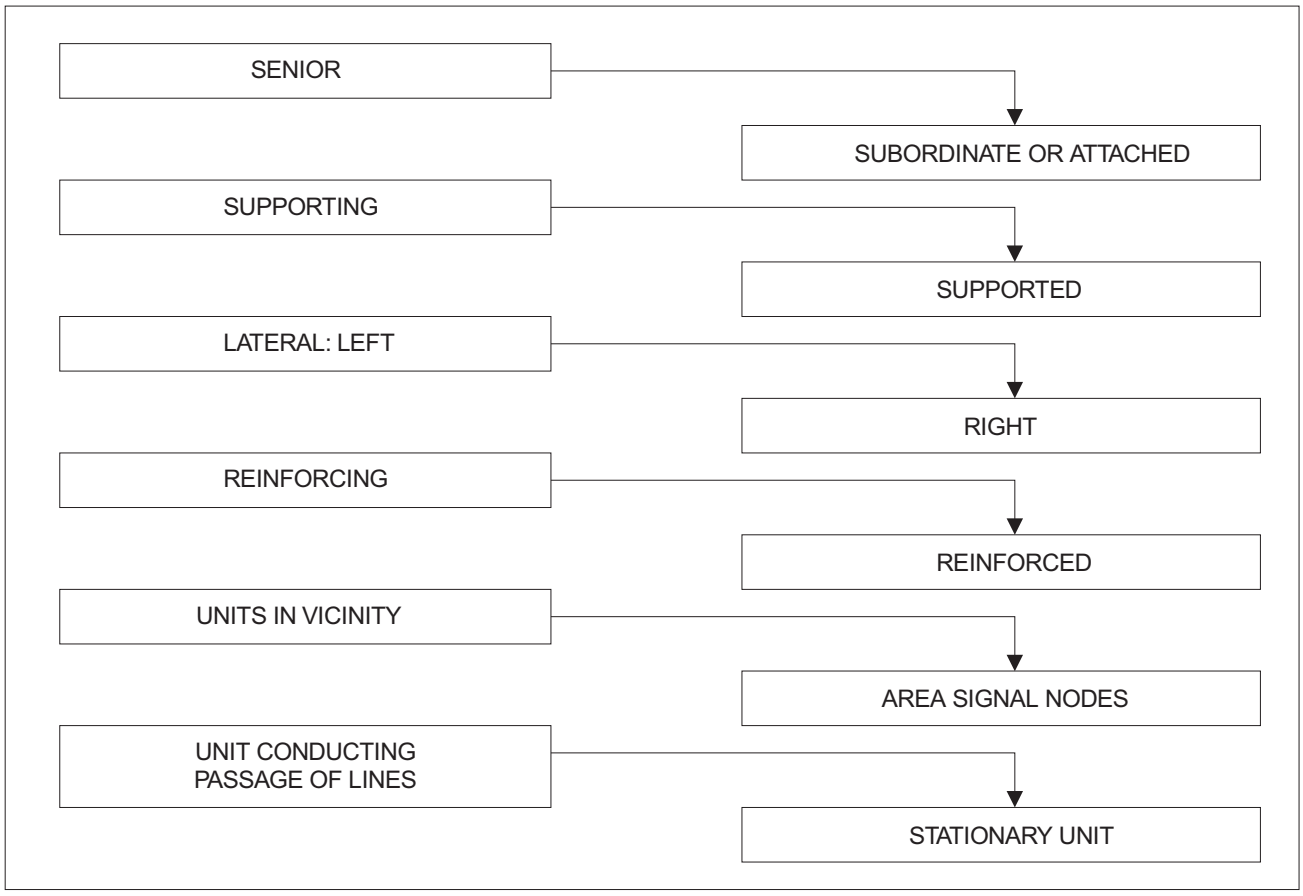

Figure 2-7. Connectivity Relationships

allows ground and surface units to accomplish their objectives without being hindered by enemy aircraft or missile attack.

Force application brings airspace power to bear directly against surface targets. Missions include strategic attack and those directly contributing to ground operations, i.e., interdiction and close air support. These missions must be synchronized to provide the synergism of joint employment.

Force enhancement increases the ability of aerospace and surface forces to perform their missions. Missions include surveillance and reconnaissance, electronic combat, air refueling, and airlift.

Force support missions sustain forces.

2.6.1 Power Projection in an Information Age. As the National Military Strategy evolved from one of containment to a post Cold-War strategy of engagement and enlargement, the Air Force also changed to prepare itself to exploit C^4I information technologies while resizing to meet force structure objectives. As a result, the Air Force has resized from 16 active Fighter Wings and 12 reserve Fighter Wings in fiscal year 1993 to an objective 13 active Fighter Wings and 7 reserve Fighter Wings. To execute the new National Military Strategy with a smaller force, the Air Force has developed a strategy to enhance its C^4I architecture and capabilities. This strategy is "Horizon '95 C^4I: A Vision for the Future."

2.6.1.1 Horizon and Communications Squadron 2000. Horizon establishes the goals for migrating from an inflexible, costly, communications infrastructure to an interoperable, pay-for-use architecture. The strategy depends on technological innovation and exploitation of commercially available products to provide the warfighter with improved C^4I support. One of

the greatest obstacles to achieving its goals is dependence upon tactical communications units for reach-back capability during the initial phase of a deployment. Reach-back is usually provided by limited, low-bandwidth satellite resources. Even the new global commercial satellite services under development will not satisfy all theater reach-back communication requirements. The communications structure must allow links to be established in such a way that the actual path is of no concern and connectivity occurs transparently without any detectable degradation of service.

2.6.1.2 Horizon Interoperability and C^4I Integration. "Information dominance is the goal — information technology is the weapon — integrated, interoperable C^4I systems are the means. (Horizon '95.)"

Smaller budgets reduce the number of user-unique systems. As a result, the Air Force has to develop communications architectures with compatible data formats suited for transferring common types of information across interoperable systems. Additionally, the desire to have access to timely, detailed information pressures the commercial communications industry to provide low-cost equipment that is compact, easy to use, and enhances the Air Force's C^4I requirements for throughput, security, mobility, and availability.

2.6.2 Air Force C^4I Infrastructure. Air Force communications organizations are shown in Figure 2-8. The Office of the Chief of Staff of the Air Force is organized with a Deputy Chief of Staff for Command, Control, Communications, and Computers. Operational and tactical level communications are within the Air Combat Command at Langley AFB, VA.

2.6.2.1 Deputy Chief of Staff for C^4I. The Deputy Chief of Staff for Command, Control, Communications, and Computers is responsible for architecture and technical policy, joint interoperability matters, future concepts, and monitoring programs and budgets for the Air Force C^4I infrastructure. Other responsibilities include direct oversight of three directorates and three field operating agencies. On the staff side are plans, policy, and resources; architectures, standards, and interoperability; and mission support. Three field operating agencies outside the staff include the Air Force Pentagon Communications Agency, Air Force Frequency Management Agency and the Air Force C^4I Agency.

2.6.2.1.1 Air Force Pentagon Communications Agency. AFPCA is responsible for supporting Air Force communications in the Pentagon and the Washington, D.C. area. They were reorganized in March 1995 under the single agency manager for Pentagon Technical Services but will continue to function as AFPCA.

2.6.2.1.2 Air Force Frequency Management Agency. The Air Force Frequency Management Agency is responsible for all matters involving frequency management.

2.6.2.1.3 Air Force C^4I Agency. The Air Force C^4I Agency is responsible for carrying out policy directed by the Air Force Deputy Chief of Staff for C^4I. As the technical arm of Headquarters USAF/SC, it ensures C^4I integration across the Air Force.

2.6.2.2 Operational and Tactical Communications. Operational and tactical level communications are organized into CCGs and CCSs.

2.6.2.2.1 CCG and CCS Organization. The 3 CCG at Tinker AFB, OK and the 5 CCG at Warner Robins AFB, GA, are subordinate to the Air Combat Command at Langley AFB, VA. The 1 CCS and 644 CCS are subordinate to US Air Forces Europe and Pacific Air Forces, respectively. Air National Guard and Air Reserve Forces CCSs are also employed when required.

2.6.2.2.2 CCG/CCS Missions. To respond to a major regional contingency, most of the Armed Forces will be deployed from the United States. Units will rely on airlift, such as the C-17, C-5, and C-141, to deploy initial forces by air to pre-linkup with equipment positioned in theater. CCG/CCS missions are to deploy equipment and personnel to augment initial communications capabilities. Their assets provide a more robust mixture of TRI-TAC and commercial communications equipment than is often found in a theater of operations. Capabilities provide long-haul communications, to include GMF satellite, tropospheric and LOS microwave, digital and analog switching, record communications, and technical control capabilities. Under the Theater Deployable Communications program, older TRI-TAC equipment will be replaced with advanced digital equipment that includes multiband satellite terminals capable of backward compatibility with GMF terminals while also being capable of using commercial satellite bands. MILSTAR is one of the key programs in the evolving C4I architecture. It provides secure, survivable, and protected support, from the tactical through the strategic level, that is not available with commercial systems.

2.6.2.2.3 Command and Control. A notional Air Force component C^2 system is depicted in Figure 2-9. The Air Force forces will plan, coordinate, and execute air operations and other assigned responsibilities through the component theater air control systems,

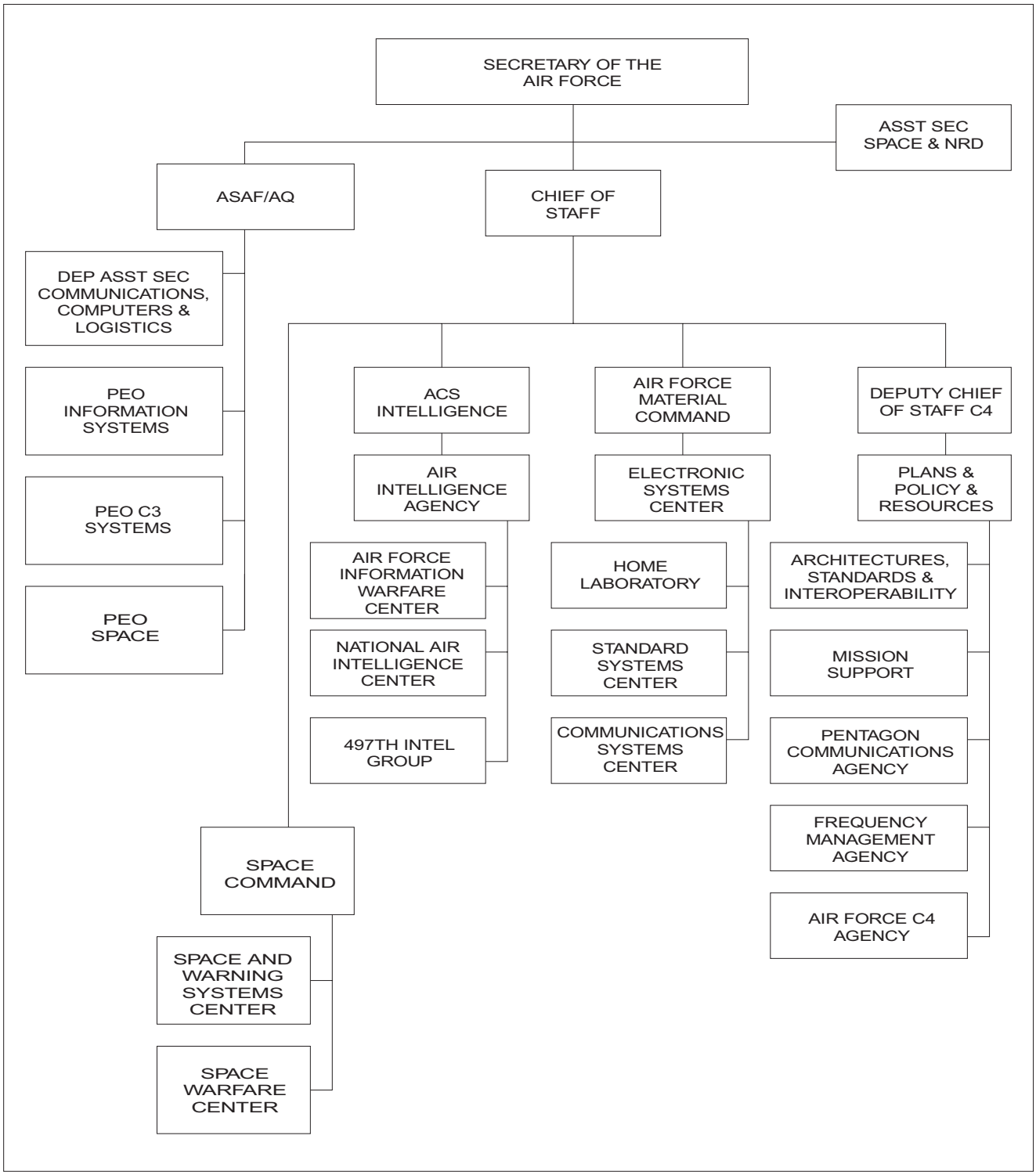

Figure 2-8. Air Force Communications Organizations

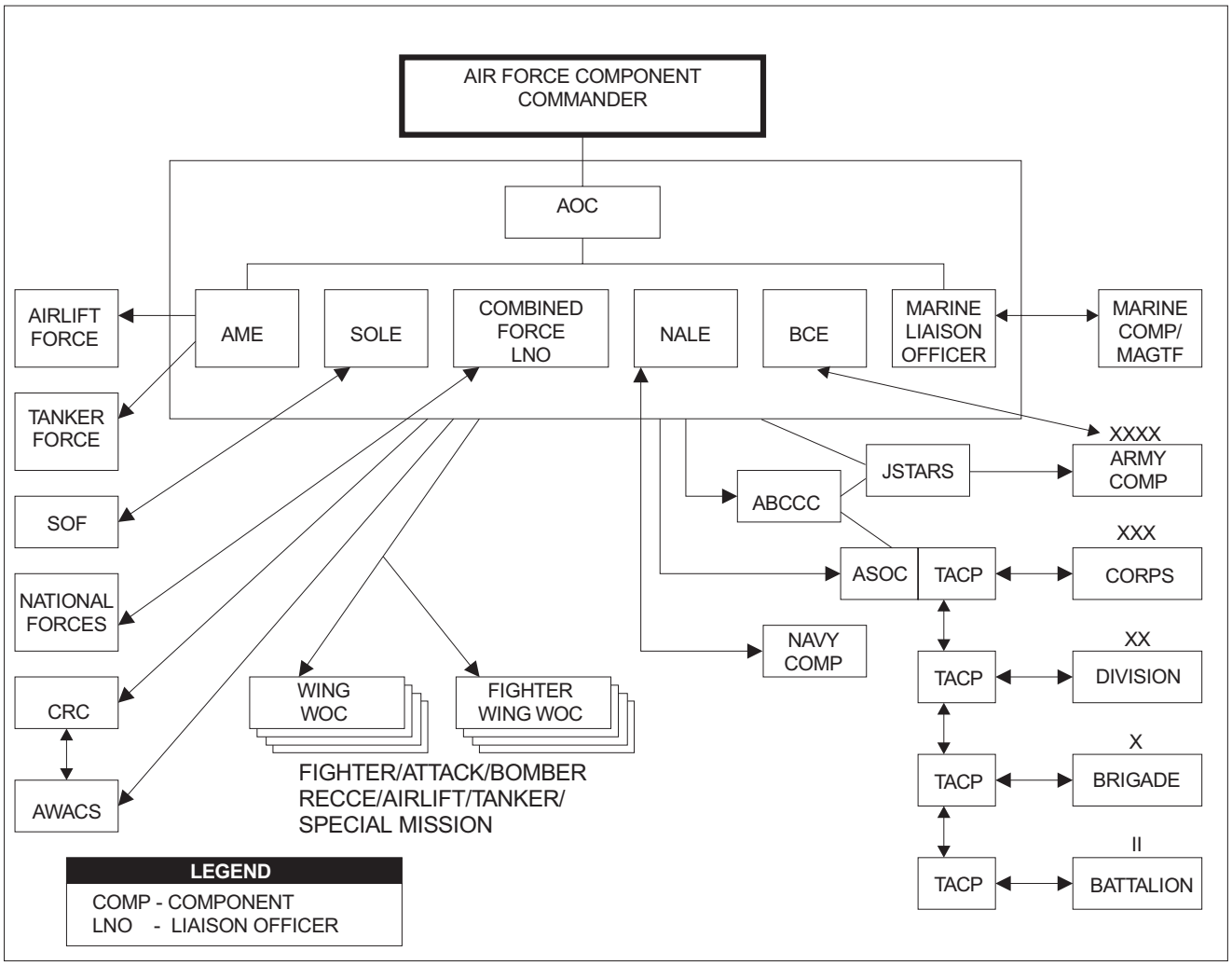

Figure 2-9. Notional Air Force Component C^2 System

which allows the required centralized planning and control and decentralized execution.

2.6.2.2.4 Theater Air Control System. The TACS (Figure 2-10) is the backbone of the Air Force forces' contribution to the TAGS. It consists of the AOC, its focal point, control and warning agencies, coordination/ liaison organizations, and Air Force wing operations centers. The TACS is designed specifically to perform centralized planning and control and to facilitate decentralized execution. Subordinate TACS agencies perform the tasks of liaison, planning, coordination, monitoring, surveillance, control reporting, and execution of air operations. Agencies participating in airspace control and air defense operations are the AWACS, control and reporting centers, and subordinate radar facilities. The air operations center, air mobility element, airborne battlefield command and control center, air support operations centers, tactical air control parties, wing operations centers, and JSTARS are those elements of the TACS most directly involved in the execution of missions in support of land forces.

2.7 U.S. COAST GUARD

The USCG is at all times a military Service and a branch of the Armed Forces though it is not normally part of DOD. In time of war or when the President directs, the USCG operates as a part of the Navy; at all other times, it is an agency of the Department of Transportation. The USCG maintains an extensive telecommunications system.

The assigned functions and activities of the USCG include aids to navigation, operation of ocean stations, search and rescue, merchant marine safety, icebreaking,

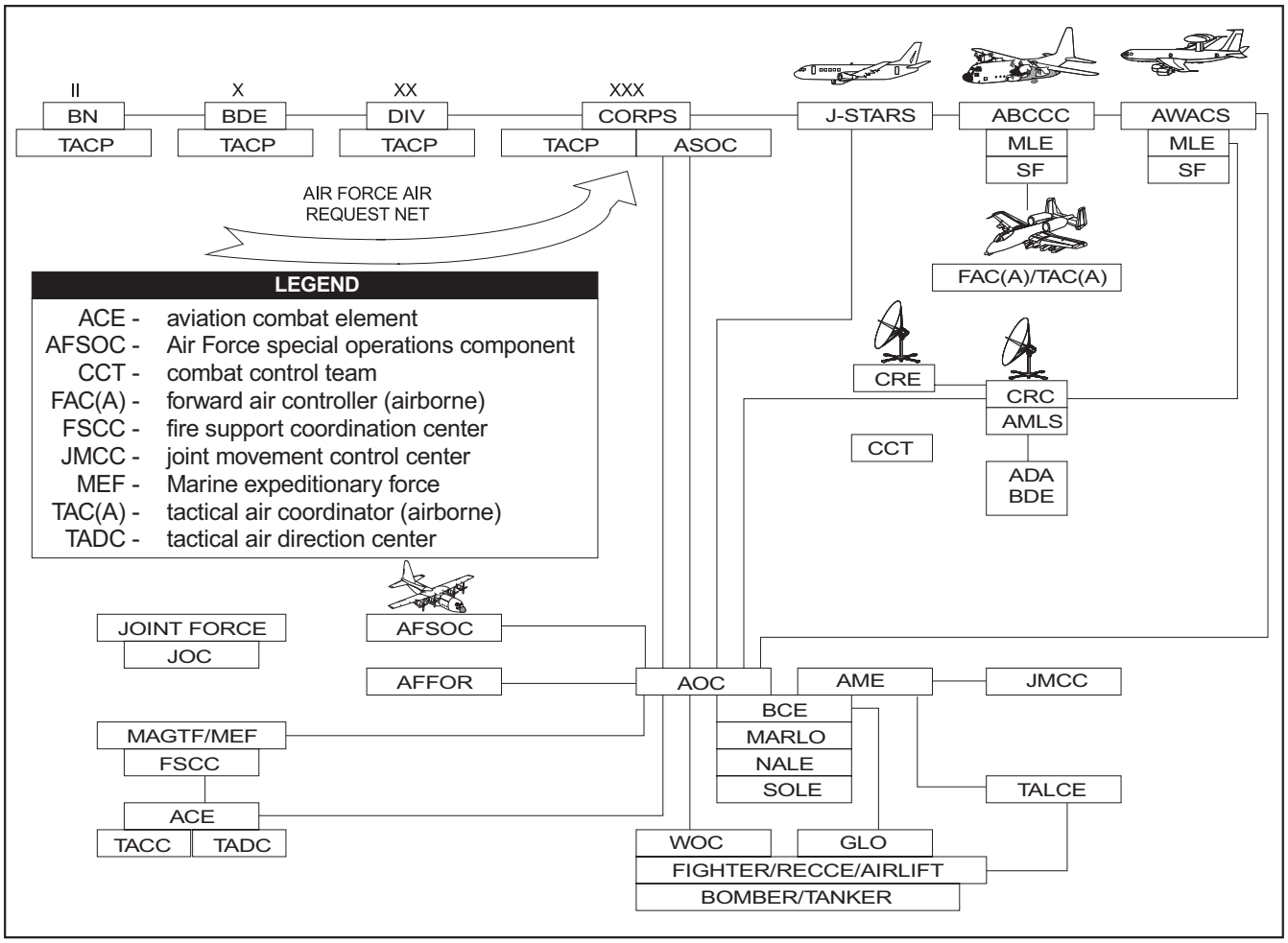

Figure 2-10. TACS Coordination Links

oceanography, law enforcement on the high seas and in U.S. waters, port security, military readiness for operations with the Navy, and reserve training. Efficient communications are necessary for the accomplishment of each of these missions.

The CNO and the Commandant of the Coast Guard exchange information necessary to ensure the USCG can operate effectively with the Navy when it is so assigned. The operation of Navy and Coast Guard information systems organizations, while primarily supporting respective service requirements, is also directed toward exercising and supporting integration of Navy and USCG efforts that would occur in wartime.

2.7.1 USCG Communications Facilities. The USCG operates six communications stations providing connectivity with ships throughout the Atlantic and Pacific Oceans and to provide a variety of services to the maritime public. Services include listening for distress and safety calls, operation of maritime safety information broadcasts, such as NAVTEX, single sideband voice, and HF fax. They also support the International Ice Patrol and the AMVER programs. Four of these stations will close by the year 2000, but transmit and receive facilities will be remoted to the remaining two Communications Area Master Stations at San Francisco, CA and Portsmouth, VA. HF high seas communications facilities are now located at Guam, Kodiak, AK, Honolulu, HI, New Orleans, LA, Miami, FL (remoted to Portsmouth), Boston, MA, and San Juan, PR.

USCG cutters and aircraft carry VHF, HF, and, in many cases, satellite equipment capable of communicating with other USCG and Navy stations, ships, and aircraft. Large vessels, such as polar ice breakers, maintain sophisticated communications suites. USCG stations, communications stations, and cutters are all being equipped with GMDSS, which is discussed in Chapter 11.

CHAPTER 3

Communications Security Organization

3.1 SPECIAL SECURITY COMMUNICATIONS

Special security communications are defined as those communications facilities that exist to support cryptologic, intelligence, Special Security Officer, and/or Sensitive Compartmented Information missions. For Navy, this includes the various communications systems, networks, circuits, and facilities at locations where SCI communications are required. Communications support to cryptologic functions are performed by personnel of the Naval Security Group, Marine Support Battalion, and Marine radio battalions, and those portions of the Special Intelligence communication network operated by Navy or Marine Corps personnel.

3.2 SENSITIVE COMPARTMENTED INFORMATION

SCI includes one or more categories of information identified by code words, caveats, or special handling instructions. Each category (or compartment) requires individual and formal authorization for access beyond that granted by a basic security clearance for Confidential, Secret, or Top Secret information.

3.3 FUNCTIONAL TASKS

The following commands have responsibility for tasks that relate to the establishment and operation of special security communications.

3.3.1 Commander, Naval Security Group Command. COMNAVSECGRU plans, programs, directs, and coordinates the cryptologic communication systems operated within the NAVSECGRU. COMNAVSECGRU implements communication plans, doctrine, programming, and guidance developed by the National Security Agency/Central Security Service and develops and promulgates procedures applicable to Navy operated special security communications. COMNAVSECGRU is also responsible for configuration control of special security communication systems as assigned by CNO or NSA/CSS, operational performance of field activities, and keeping Fleet CINCs informed of special security communications matters.

3.3.2 Fleet Commanders in Chief. The Fleet CINCs exercise operational control of tactical special security communication operations and facilities in their areas. Through their assistant chiefs of staff for cryptology/fleet cryptologists, Fleet CINCs ensure that Navy-operated tactical special security communications systems, subsystems, circuits, and facilities in their areas are adequate to satisfy their operational requirements. The Fleet CINCs review, validate, and forward to COMNAVSECGRU or ONI recommendations for improvements or changes to existing systems under their respective operational management.

3.3.3 Office of Naval Intelligence. ONI provides, manages, and maintains state-of-the-art telecommunications for naval intelligence and Navy-supported CINCs in support of Director of Naval Intelligence and customer requirements. ONI-7 determines Navy intelligence telecommunications policy through interaction with other agencies, services, and commercial vendors. ONI has management responsibility for SPINTCOMM matters under CNO (Director of Naval Intelligence, N2) and has primary Navy cognizance over programming, implementation, and operation of that portion of the DSSCS supporting the intelligence community.

3.3.4 Chief of Naval Operations. CNO provides basic guidance and policy guidance for all naval activities. Under his direction, elements of the Office of CNO (N2) and Commander Space and Naval Warfare Systems Command serve as program managers for various fleet cryptologic systems, identifying operational requirements and providing resource allocation for development, procurement, installation, and operation of tactical systems. CNO (N2) is the program sponsor for SPINTCOMM under GDIP.

3.3.5 Commandant, U.S. Marine Corps. CMC provides Marine Corps SPINTCOMM resource requirements to ONI for inclusion in the Department of the Navy GDIP and operates and maintains Marine Corps SPINTCOMM facilities to the extent authorized.

3.3.6 National Security Agency. NSA provides basic guidance and direction in SIGINT communications system design, performance objectives, policy, doctrine, and resource management.

3.3.7 Central Security Service. CSS provides operational direction of SIGINT communications through establishment of operating procedures, continuous performance evaluations, and direction of corrective actions. CSS meets telecommunications requirements through the DISN and the organic capabilities of the Service cryptologic elements.

3.3.8 Defense Information Systems Agency. DISA is responsible for organizing and operating the DISN to provide all long-haul point-to-point circuitry used by the DOD, including that employed in support of special security communications networks.

3.3.9 Defense Intelligence Agency. DIA is responsible for the control and management of the DSCS terminals supporting the Joint Special Security Officer system and for the information processed via those terminals. DIA is the validating authority for Navy and Marine Corps SPINTCOMM requirements. Proposals for new or expanded facilities are submitted by ONI to DIA for validation in accordance with DIAM 35-2.

3.3.10 Commander, Naval Computer and Telecommunications Command. COMNAVCOMTELCOM is responsible for planning, programming, implementing, and managing communication facilities in support of naval operating forces and the shore establishment. COMNAVCOMTELCOM is also the primary Navy interface with DISA for the acquisition of DISN circuitry to support Navy requirements, including special security communications.

3.3.11 Commander, Space and Naval Warfare Systems Command. COMSPAWARSYSCOM provides resource execution of CNO programs and requirements.

3.3.12 NAVSECGRU Activities, Detachments, Departments, and Other Elements. NAVSECGRU units operate assigned special security communications systems and circuitry in a manner designed to ensure the greatest possible degree of reliability, security, and speed. Each organization will keep COMNAVSECGRU and their chain of command, including the fleet commander in chief, apprised of the adequacy of system configuration, security, and facilities necessary to perform the assigned mission and of any unique conditions that affect the conduct of special security communication functions.

3.4. REFERENCE

For in-depth information, refer to NAVSECGRUINST S2501.1 (series).

CHAPTER 4

Frequency Management Organization

4.1 CONTROL OF THE FREQUENCY SPECTRUM

The radio frequency spectrum is a finite natural resource. The demand for frequency authorizations for radio services routinely exceeds the available spectrum. The existence of such a situation without positive frequency management would seriously degrade communications-electronic service reliability. Frequency management is the control of the radio frequency spectrum through the spectrum certification and assignment, surveillance of equipment, research and development, and frequency record administration. Frequency management should result in maximum satisfaction of all valid frequency requirements through optimum use of the radio frequency spectrum.

The spectrum certification process, assignment, and protection of all radio frequencies used by any component of the Navy are the responsibility of OPNAV N6 via N61F. Detailed execution of the frequency assignment responsibility is vested in NAVEMSCEN, an Echelon 3 command that is under the auspices of COMNAVCOMTELCOM.

4.2 INTERNATIONAL TELECOMMUNICATION UNION

The ITU was created in 1932 in Madrid, Spain by the 13th International Telecommunications Conference and the 14th International Radio-Telegraph Conference. The ITU is an agency of the United Nations. The member nations cooperate to improve the effective use of telecommunications and the radio frequency spectrum.

Each nation reserves the right to use the entire frequency spectrum; but each also recognizes the need for worldwide regulation and conservation of this limited resource. Accordingly, frequency regulations exist on an international as well as on a national and agency level.

4.2.1 Composition of the ITU. There are several technical bodies within the ITU. They strengthen and support the parent organization and contribute directly to improved telecommunications through the promulgation of technical papers and recommended standards. These bodies are:

1. The Plenipotentiary Conference, which is the supreme organization of the Union
2. The Council, which acts on behalf of the Plenipotentiary Conference
3. World conferences on international telecommunications
4. The Radiocommunication Sector, including world and regional radiocommunication conferences, radiocommunication assemblies and the Radio Regulations Board
5. The Telecommunications Standardization Sector, including world telecommunication standardization conferences
6. The Telecommunications Development Sector, including world and regional telecommunication development conferences
7. The General Secretariat.

The ITU establishes the international allocation of and regulations for the use of the radio frequency spectrum. It also promotes the development of the technical facilities and establishes doctrine for international telecommunications, including radio regulations. These allocations and regulations have treaty status and, upon adoption by a country, become the law of the land.

The ITU Secretariat serves as a focal point for disseminating to all member nations such information as stations, call signs, radio services schedules, and recommended technical standards and tolerances. An

international monitoring effort is also maintained under ITU auspices for determining spectrum occupancy.

4.3 U.S. FREQUENCY MANAGEMENT

Figure 4-1 shows that, at the national level, the basis for U.S. frequency management is derived from the Communications Act of 1934, as amended. Under this act, the Federal Communications Commission is responsible to Congress for regulating frequency use by U.S. non-governmental users and the President is responsible to Congress for regulating frequency use by U.S. Government agencies. The President has delegated national telecommunications policy authority to DOC/NTIA, NSA, and OMB. These activities formulate policies and standards for government agency operation of telecommunications. DOD frequency requirements are identified through the Interdepartment Radio Advisory Committee, which serves in an advisory capacity to NTIA. Overall authority for the use of radio frequencies by U.S. Government agencies within the United States and its possessions is obtained from DOC/NTIA through IRAC. IRAC is composed of frequency management representatives of all the principal government users of the radio frequency spectrum, including the Departments of the Army, Navy, and Air Force.

4.3.1 Interdepartment Radio Advisory Committee. IRAC's functions include the following:

1. Authorizing assignment of frequencies to government radio stations
2. Assisting and advising appropriate national authorities on related technical problems
3. Serving as an advisory body to the Department of State in formulating U.S. positions for international conferences
4. Approving, in collaboration with the FCC, the allocation of frequency bands within the provisions of the international allocation table.

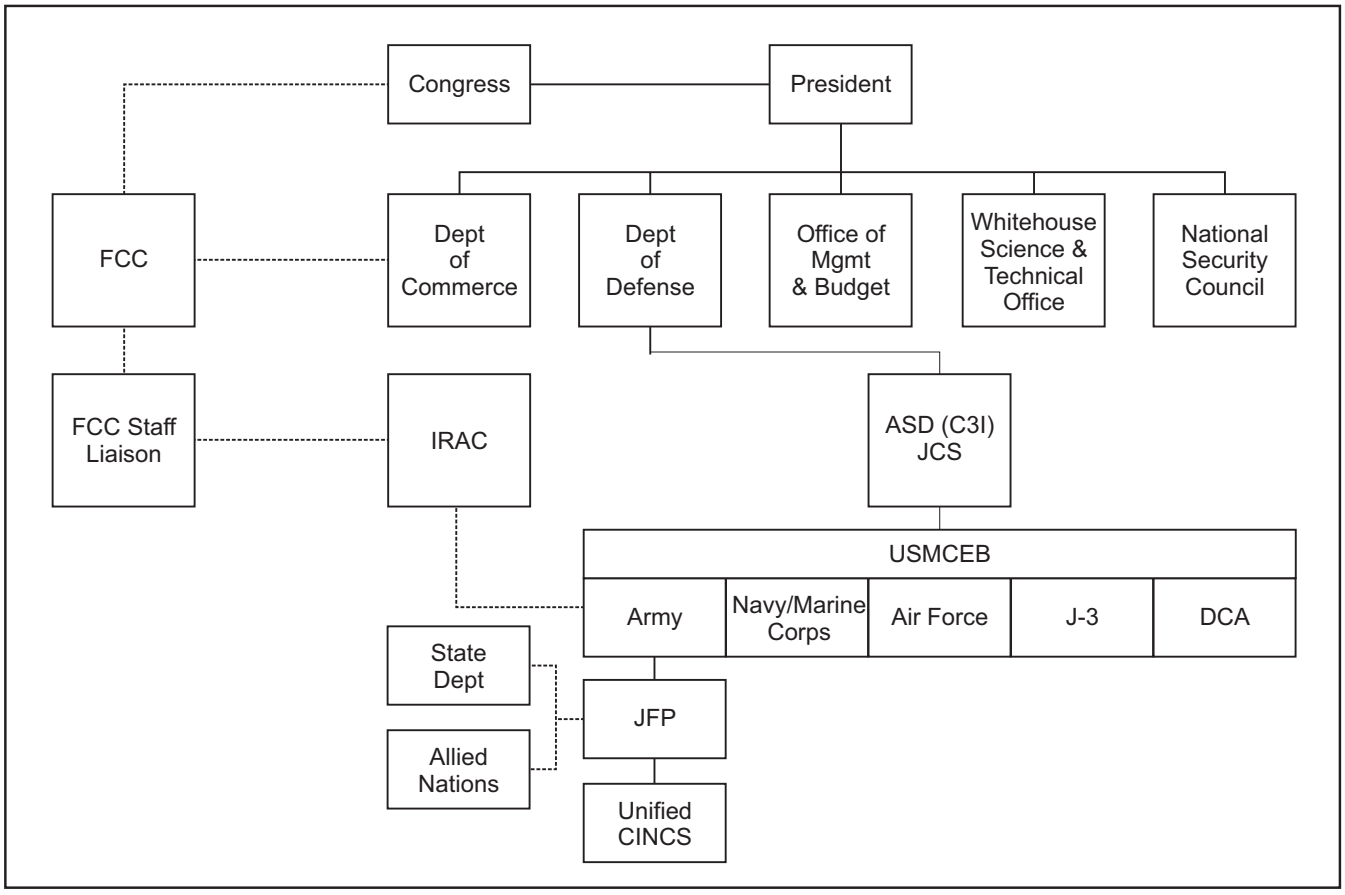

Figure 4-1. Frequency Management Organization

The actual radio frequency assignment function is vested in the Frequency Assignment Subcommittee of IRAC. It is composed of representatives of the various government user agencies, with liaison representation from the FCC.

4.3.2 Joint Frequency Planning. Basic policy and guidance for radio frequency management within the Department of Defense is promulgated in DOD Directive 4650.1.

The coordination or resolution of U.S. military frequency matters is conducted by the USMCEB. The JFP, a component of the USMCEB, provides the forum for resolving matters of joint interest in the areas of radio propagation and frequency allocation, coordination, assignment, and interference.

Unified commanders under the JCS have overall responsibility for all U.S. military radio frequency use within their areas of responsibility. They may make input into the JFP.

4.3.3 Navy Frequency Management. As delegated by CNO, the allocation, assignment, and protection of all radio frequencies used by any component of the Department of Navy are the responsibility of OPNAV N6. The detailed execution of the frequency assignment responsibility is vested in COMNAVCOMTELCOM and assisted by NAVEMSCEN. Through this office, COMNAVCOMTELCOM procures, coordinates, assigns, and protects radio frequencies for use by the Department of the Navy. Refer to Chapter 31 for additional details on Navy frequency management responsibilities.

4.4 WORLDWIDE FREQUENCY COORDINATION

Collaboration and coordination among the military frequency management bodies of the U.S. and several Allied governments is affected worldwide using established military channels.

Coordination is also affected among the United States, United Kingdom, Australia, and Canada through the USMCEB, the United Kingdom Defense Signals Staff, the Canadian Forces Communications-Electronic Staff, and the Australian Joint Communication-Electronic Staff.

In NATO, the frequency management for operations or planning corresponds to the patterns of command. The Allied Radio Frequency Agency (ARPA) and the Frequency Management Field Office (FMFO) located at NCTAMS MED coordinate radio frequency matters in support of the NATO nations, SAC, and SACLANT. U.S. frequency planning for NATO normally includes coordination with U.S. unified commanders.

4.5 JOINT SPECTRUM CENTER

JSC is a JCS/DOD directed organization that operates under Air Force management for the benefit of all DOD agencies. JSC maintains a comprehensive electromagnetic database and appropriate mathematical models in order to study and analyze electromagnetic compatibility problems submitted by the Services and other agencies of DOD. This database includes technical equipment characteristics and environmental information on current and planned electronic installations. The mission of JSC is to provide advice and assistance on electromagnetic compatibility matters to the Secretary of Defense, JCS, the Military Departments, and other components of DOD.

CHAPTER 5

Other U.S. Government Agency Communication Organizations and Functions

5.1 INTRODUCTION

During the normal course of operations, Navy information and telecommunication personnel may be required to work cooperatively with personnel representing other government agencies. The organization and functions of some of these agencies are discussed in this chapter.

5.2 PRESIDENTIAL COMMUNICATIONS

Most Presidential communication support is provided through WHC, which is staffed in large part by communications and information specialists from the Military Departments. WHCA is a component of DISA.

The mission of WHCA is to provide telecommunications and related support to the President, Vice President, White House Senior Staff, National Security Council, U.S. Secret Service, and others, as directed by the White House Military Office. This support includes nonsecure voice, secure voice, record communications, audiovisual services, automated data processing support, and photographic and drafting support both in Washington DC and to trip sites worldwide.

Upon occasion, the Military Departments are called upon by JCS and DISA to provide communications support to WHCA through the temporary provision of equipment, support personnel, or bandwidth.

5.3 FEDERAL EMERGENCY MANAGEMENT AGENCY

FEMA is an independent federal agency with a mission to provide leadership and support to reduce loss of life and property and protect our nation's institutions from all types of hazards through a comprehensive, risk-based, all-hazards emergency management program of mitigation, preparedness, response, and recovery.

The DOD is among the numerous federal agencies that are FEMA's partners in the nation's emergency management system. Others include the Federal Communications System and the National Weather Service, which is part of the Department of Commerce.

During certain categories of national emergencies, DOD communications systems might be used to support FEMA. During other emergencies, FEMA might authorize DOD users to take over the facilities, call signs, and frequencies of non-governmental users.

5.4 NATIONAL COMMUNICATIONS SYSTEM

The NCS was established by Presidential direction in 1963 and reorganized under Executive Order 12472 to provide a unified governmental system that can link together, improve, and extend, on an evolving basis, the information systems, facilities, and components of the various agencies of the federal government under conditions ranging from peacetime to crisis and during national emergencies of any variety.

The Secretary of Defense serves as the Executive Agent for the NCS and the Director, DISA, is the manager. COMNAVCOMTELCOM serves as the Department of the Navy point of contact and coordinates communications matters that affect Navy-operated components of the NCS.

The NCS is composed of the facilities listed below. Additional systems, including those of other government agencies, may be added.

1. The DISN, including Navy-operated segments

2. State Department Diplomatic Telecommunications System

3. General Services Administration systems such as FTS

4. National Aeronautics and Space Administration

5. Federal Aviation Administration

6. Department of Commerce weather networks

7. The FCC Emergency Action Notification Network

8. Department of the Interior Trust Territory Pacific Islands.

5.5 STATE DEPARTMENT

The State Department operates the U.S. Diplomatic Telecommunications Service. The DTS director and CNO have formally agreed to render each other maximum cooperation in the provision of mutual communications support.

Normally, messages from Navy originators destined for the Department of State or its subordinate activities shall be addressed for action to the appropriate U.S. Defense Attaché Office at the relevant State Department activity.

5.6 FEDERAL COMMUNICATIONS COMMISSION

The FCC, an independent Federal Agency, was created by the Communications Act of 1934. It is charged with regulating interstate and international communications by radio, television, wire, satellite, and cable. The FCC is directed by five commissioners appointed by the President and confirmed by the Senate. It is organized into bureaus and offices, such as the International Bureau, which regulates international and satellite communications.

CHAPTER 6

Allied Organizations

6.1 NORTH ATLANTIC TREATY ORGANIZATION

NATO is a group of 16 nations from Western Europe and North America that was formed after the end of World War II to provide for the common security of the member nations.

The significance of NATO is its chain of command. Military forces of NATO nations are assigned to NATO missions, as required, in accordance with the terms of the treaty. These forces are under the direct operational command of one of the major NATO commanders. There are two such commanders:

1. SACLANT is the U.S. flag or general officer that is assigned as USCINCACOM.

2. SACEUR is the U.S. Army general officer that is assigned as USCINCEUR.

The major NATO commanders report to the NATO Military Committee, which is chaired by a German general officer.

The military policies, goals, and strategies of NATO are formulated by the defense ministers of the respective member nations. The actual conduct of military operations is managed by the Military Committee, which directs one or both major NATO commanders.

Just as U.S. military services form joint task forces by contributing forces, the NATO nations contribute forces to create a combined task force. NATO has very few permanent or standing forces but usually activates forces to fulfill the objectives of a specific mission. However, there is a small destroyer squadron sized naval force called the Standing Naval Force Atlantic that is formed from those nations with a maritime tradition.

Participation in NATO operations does impact on communications planning. Commanders, commanding officers, and communications personnel must become familiar with the differences between U.S. and NATO communications procedures and practices.

6.2 AUSTRALIA, CANADA, NEW ZEALAND, UNITED KINGDOM, UNITED STATES

The purpose of AUSCANNZUKUS is to ensure member nation military units have sufficient C^4I connectivity and interoperability to be able to participate effectively in all forms of combined naval operations.

Additionally, AUSCANNZUKUS works to promote uniformity and a cooperative spirit between member nations on agreed standards and minimal operational capabilities and to exchange information on issues of interoperability, providing a forum to national authorities. AUSCANNZUKUS is a consensus body with no authority to impose decisions on member nations.

The organization within AUSCANNZUKUS that addresses the above matters is the CCE, which works to implement approved communications methods and processes by which interoperability and standardization is promoted. OPNAV N6 serves as Chairman of the Supervisory Board.

Additional information concerning the functioning of AUSCANNZUKUS and the CCEB may be found in the AUSCANNZUKUS Naval Command and Control Handbooks available from the AUSCANNZUKUS "Permanent" assigned on the staff of OPNAV N60.

6.3 INTER-AMERICAN NAVAL TELECOMMUNICATIONS NETWORK

IANTN provides the ability for the exchange of cryptographically covered communications among our CNO and his counterparts of member navies. These include: Argentina, Bolivia, Brazil, Chile, Columbia, Dominican Republic, Ecuador, Guatemala, Paraguay, Peru, Uruguay, United States, and Venezuela.

The U.S. entry point for the IANTN is NAVCOMTELSTA Puerto Rico. Various IANTN operating publications provide detailed information on IANTN procedures. Network operations are conducted in English, Portuguese, and Spanish.

Operation of the IANTN is overseen by the IANTN Board, whose membership is comprised of the Commanding Officer, NAVCOMTELSTA Puerto Rico, and naval officers provided by three of the member navies on a rotating basis, plus one additional U.S. naval officer.

The Inter-American Naval Conference, which is comprised of the chiefs of naval telecommunications from all member navies, provides policy direction under the auspices of the Inter-American Chiefs of Naval Operations and Inter-American Defense Board.

Part II — Special Doctrinal, Legal, and Policy Considerations

CHAPTER 7

Communications Actions on Declaration of War

7.1 ACTIONS ON MOBILIZATION

CNO will execute certain actions when a war or certain other national emergencies are declared. All naval commanders shall implement the provisions of Figure 7-1 on receipt of the executing order, the text of which will read:

"EXECUTE CHAPTER SEVEN NWP SIX-ZERO ONE." This applies to the U.S. Coast Guard when assigned to U.S. Navy control and to U.S. controlled merchant ships, including MSC chartered ships (see Chapter 24). The Canadian Defense Force has issued a similar directive.

WHAT		WHO	WHEN	REFERENCE
PROCEDURE	ACTION			
Minimize	Impose	All	Immediately	NWP 6-01 Chapter 13
Class E	Cease	All	Immediately	NTP 4
Amateur Radio	Cease	All	Immediately	NWP 6-01 Chapter 32
Citizen's Band Radio	Cease	All	Immediately	NWP 6-01 Chapter 32
EMCON	As Tactical Situation Requires	Operational Forces	As Directed	NWP 6-01 Chapter 15
Recognition and ID	Commence Using	Operational Forces	Immediately	AMSPs 15-158
Authentication	Mandatory When Entering Network	Operational Forces	Immediately	
Allied MERCOMM System	Implement	Coast Guard and NAVCOMTELSTAs	Immediately	ATP 2, Vol II; ACPs 149 and 176
Communications Watch	Maintain	All	Immediately	NWP 6-01 Chapter 15

Figure 7-1. Communications Actions on Declaration of War

CHAPTER 8

Messages Requiring Special Handling

8.1 GENERAL

Certain types of messages require special handling and distribution beyond that afforded by the assigned classification. To identify such messages, drafters/releasers are responsible for determining if special handling designators are required. Applying those special handling designators needed, in the correct position within the message, is a drafter responsibility.

8.2 EMERGENCY ACTION MESSAGES

JCS EAMs are identified by serial numbers 100, 200, or 300. They contain instructions from high-level authority and have predetermined formats as explained in Joint Pub 1-03 (Series) publications. Such messages are transmitted by various telecommunications systems and normally carry Flash (Z) precedence. EAMs addressed to ALSIOP may employ the emergency command precedence, prosign Y, designating special handling at NAVCOMTELSTAs. These are vital messages of an extremely time-sensitive nature and rapid processing is mandatory to obtain the fast reaction required by their content. Applicable U.S. Navy units will establish standard, tested procedures for handling such messages.

The flag word "RED ROCKET" has been developed by the JCS for certain messages. Usage and handling procedures are classified and have been promulgated on a need-to-know basis. Joint publications apply.

The flag word "WHITE PINNACLE" has been developed to measure the effectiveness of the procedures for passing time-critical information from an operating unit to NMCC. A commander's OPREP-3 CPX will be used to respond.

All applicable units should have SOPs readily available so all responsible personnel, including watchstanders, can handle these types of messages quickly and correctly.

8.3 CRITICAL INTELLIGENCE MESSAGES

A CRITIC message is so designated and handled because it contains vital information about a situation affecting the security or the best interests of the United States to such an extent that the information should be brought to the immediate attention of responsible officials at the seat of government. This information is of such extreme importance that the message must be given the most rapid handling possible from origin to ultimate delivery to authorized recipients.

8.3.1 CRITIC References. DIAM 58-2, Vol. II, Part 9, Chapter 1, contains detailed guidance and prescribes the standardized procedures to be followed by DOD components in reporting CRITIC information.

8.4 LIMITED DISTRIBUTION MESSAGES

LIMDIS messages are associated with special projects, cover names, or specific subjects — such as urinalysis screening results — that require limited internal screening and distribution. The intent and meaning of LIMDIS is to limit distribution of copies or electronic delivery of such messages to those specifically authorized to have access to the information. The commanding officer, not the communications officer, determines distribution of LIMDIS messages. When a LIMDIS message relating to a special project, cover name, or other criteria is drafted, it is the originator's responsibility to ascertain that all addressees are authorized recipients of that type of traffic. Commands will furnish to their serving NTCC a list of authorized local recipients of LIMDIS messages. If a particular LIMDIS subject does not appear on this list, the NTCC will determine the action or cognizant office or officer on the basis of the message's content and provide one copy to him/her only until he/she directs any additional dissemination.

8.5 SPECIAL CATEGORY MESSAGES

SPECAT is a designation applied to classified messages associated with a specific project or requiring

special handling procedures. Types of SPECAT messages include SPECAT Exclusive For and SPECAT SIOP-ESI. NTP-4, Chapter 4, Section IV includes more detailed information on SPECAT messages.

8.5.1 SPECAT Exclusive For. SPECAT Exclusive For messages are used for certain high-level policy or politically sensitive matters, as opposed to operational ones. Within the Navy, SPECAT Exclusive For is reserved for use by flag and general officers or officers in command.

8.6 TIGHT CONTROL MESSAGES

TICON messages are of such sensitive nature that only those communications personnel absolutely required and those specifically designated individuals at each command shall process them. OPNAVINST C3490.1 contains detailed procedures for handling TICON messages.

8.7 PERSONAL FOR MESSAGES

Personal For messages are intended to convey information on a personal basis and ensure greater privacy than can be afforded by ordinary messages. The use of Personal For messages is reserved for flag officers or officers in a command status. Personal For messages may be classified or unclassified depending on content and will be handled by personnel who possess a security clearance commensurate with the security classification of the particular message. Personal For messages are not normally used outside the Navy and therefore are not recognized as such nor provided special handling outside Navy channels. Distribution of a Personal For message is made solely to the designated recipient but additional distribution may be made when directed by the recipient. Such messages, however, should not be readdressed. To prevent Personal For messages from being distributed by commands with automatic SSIC distribution, an SSIC of //N00000// should be assigned.

Special delivery instructions, when used, shall follow the SSIC or be placed on the next line if they exceed 69 characters. Passing and distribution instructions will not be separated into an individual paragraph of text. Passing instructions placed in the second line of the text (below the classification line) consisting of office codes/symbols/names will not be used by Navy, Marine Corps, and Coast Guard activities except as follows:

1. By headquarters staffs passing a message to a temporarily relocated commander

2. Messages originated by Marine Corps commands to other than U.S. Navy/Coast Guard.

CHAPTER 9

Reporting Vital Information

9.1 DEFINITION OF VITAL INFORMATION

Vital information encompasses politico-military information that will influence an immediate decision or course of action by a commander or representative of the government. It is of such importance that reliable, prompt, and rapid delivery to the addressee is paramount.

9.2 DETERMINING REPORT RECIPIENTS

The designation of addressees of a vital information report is a decision the originator must make. These should include, as a minimum, all those commands and commanders known to be directly or indirectly affected by the content of the report.

9.3 RADIO SILENCE, SECURITY, AND REPORTING

Radio silence may be broken when making enemy contact reports in accordance with OTC command guidance. All commanders must indoctrinate those under their command in the importance of and methods for prompt, rapid reporting and delivery of vital information.

The relative importance of rapidity versus security when making an enemy contact report depends upon the circumstances at the time. When time allows, or when security is essential, reports should be cryptographically protected.

9.4 REPORTING CIRCUITS

Vital information may be reported on almost any type of circuit, including inter/intra task force/group networks; organizational networks; ship-shore circuits; USW, AEW, and SAR networks; DSN; and IDSN.

9.5 COMBAT SCENE-OF-ACTION CIRCUITS

Combat scene-of-action circuits are operated in the simplex or half-duplex mode, contain two or more elements of the same or different forces, and are used without prior establishment of a communications plan. Cryptographically covered combat scene-of-action circuits shall be operated in accordance with current directives. Authentication shall be used on reports from the scene of action when uncovered circuits are used.

CHAPTER 10

Search and Rescue Operations

10.1 DEFINITION OF SEARCH AND RESCUE

SAR is the employment of available personnel and facilities to render aid to persons and property in distress situations. NWP 3-50.1 (formerly NWP 19-1) contains complete details.

10.2 SAR REGIONS

Regions for SAR have been established as follows:

1. The inland region includes the inland areas of CONUS (less Alaska and the waters under U.S. jurisdiction). The SAR coordinator is the U.S. Air Force.

2. The maritime region includes the waters subject to U.S. jurisdiction, the State of Hawaii, U.S. territories and possessions (except the Canal Zone), and the high seas. The SAR coordinator is the U.S. Coast Guard.

3. The overseas region includes the overseas unified command areas (including the inland area of Alaska) that are not within the inland or maritime regions. The SAR coordinator is the appropriate area unified commander.

The regional SAR coordinator executes agreements with the services within his region to provide for optimum use of each agency's communications and other facilities during regional SAR missions. The agreements usually include provisions that the other agencies delegate authority to the SAR regional commander for the coordination of their facilities during a SAR mission.

10.3 SCOPE OF THE SAR MISSION

SAR operations are implemented by designated SAR commanders either upon routine request or when a distress incident is known or believed to have occurred.

The SAR operation is terminated at the direction of the SAR commander when rescue has been effected, assistance is no longer required, or further SAR measures cannot be undertaken or would be of no avail.

10.4 SAR COMMUNICATIONS

During a SAR mission there is the requirement for a continuous communications interface between the participating rescue commander, shore activities, surface ships, and aircraft. These communications must provide a means for prompt reporting to rescue authorities, prompt dispatching of SAR units, and overall coordination.

Commanders of task organizations provide their own SAR facilities as far as practicable. The communication channels established for ship-to-shore and normal communications within the force, group, or unit will be used to the maximum extent possible for SAR purposes.

Commanders of unified commands assign specific areas of SAR responsibility to subordinate commanders. SAR coordination centers are established in these areas to coordinate effort and provide maximum assistance. The commanders of unified commands may issue or designate subordinate commanders to issue directives for joint SAR operations.

SAR frequencies are contained in NWP 3-50.1, ACP 135, and Figure 10-1. Instructions for use of these frequencies will be promulgated in operation plans and orders or commands issued to assigned SAR responsibilities. If a craft cannot comply with SAR frequency requirements, the use of any available frequency is permissible in an emergency situation.

10.5 LOST AIRCRAFT PROCEDURES

ACP 135 is effective where the military situation permits. U.S. carrier-based and other ship-based aircraft distress procedures are contained in NWP 3-50.1.

FREQUENCY	USAGE
2670 kHz	Coast Guard HF Working Frequency. (2671.4 kHz is actual, with a window of 2670 kHz)
3024.4 kHz	International voice SAR on-scene (3023 window).
5680 kHz	International voice on-scene.
123.1 MHz	National aeronautical SAR scene of action. International SAR scene of action in U.S. and Canadian International Civil Aviation Organization (ICAO) regions of responsibility in Atlantic and Pacific.
138.78 MHz	U.S. Military voice SAR on-scene and direction finder (DF).
157.1 MHz	Coast Guard VHF-FM working frequency (CH22A).
282.8 MHz	Joint/combined on-scene and DF (UHF).
243.0 MHz	Survival Craft. Motor whaleboat/rescue helicopter communications. U.S. Military designated Air/Ground Distress.
381.8 MHz	Primary Air/Ground. Coast Guard Command net (working frequency between USCG aircraft, cutters, etc.).

Figure 10-1. Commonly Used On-Scene Search and Rescue Frequencies

The use of radio and radar homing devices is dependent on the EMCON order in effect. The OTC of each separate force or group must decide if the tactical situation permits the relaxation of electronic silence to home lost aircraft.

10.6 SUBMARINE DISASTER SAR OPERATIONS

Submarine disaster SAR operations may be designated either as EVENT SUBMISS (the initial search state) or EVENT SUBSUNK (the full scale search). In either case, the primary SAR mission is to render prompt assistance to a submarine through an efficient search for its location and the rescue of its personnel. Salvage is not within the scope of SAR operations. EVENT SUBMISS and EVENT SUBSUNK differ from other SAR undertakings in that they are complex operations involving special equipment and procedures peculiar to the submarine service. The procedures for these events, plus specific communication details applicable to them, are contained in NWP 3-50.1.

10.7 JOINT SAR OPERATIONS

Joint interface and coordination during SAR operations is only briefly touched upon in this chapter. For more detailed guidance refer to Joint Pubs 3-50 and 3-50-1.

CHAPTER 11

Distress and Other Emergency Communications

11.1 DISTRESS AND SAFETY

For many years, communications in situations of distress, urgency, or safety followed guidelines established and standardized by the ITU. Improvements in computing capability, digital communications, satellites, and other technological areas are improving both the speed and reliability of SAR communications. As a result, the traditional forms of distress communications discussed in this chapter are rapidly being replaced internationally by the new Global Maritime Distress and Safety System. Although U.S. Navy distress and safety policy currently remains unchanged, it too is headed toward implementation of some of these advancements. This chapter briefly discusses GMDSS and outlines those guidelines of traditional distress communications as they pertain to naval operating forces. Refer also to ACP 135. Distress frequencies are listed in ACP 135, NWP 3-50.1, RAPUB 117, and Figure 11-1.

11.2 GLOBAL MARITIME DISTRESS AND SAFETY SYSTEM

During the late 1970s, the United Nations' International Maritime Organization began studying ways to improve maritime distress and safety communications. Their study led to the International Convention on Maritime Search and Rescue, calling for the development of a global search and rescue plan. They also created the GMDSS to support search and rescue efforts. GMDSS, which is undergoing global implementation, is based upon a combination of satellite and terrestrial radio services. Unlike its primarily ship-to-ship predecessor, it is a ship-to-shore, rescue coordination center concept.

GMDSS consists of several systems designed to provide alerting (including position determination of the unit in distress), search and rescue coordination, locating, maritime safety broadcasts, general communications, and bridge-to-bridge communications. U.S. naval operating forces will be included in future implementation plans for some functions of GMDSS.

11.3 DISTRESS COMMUNICATIONS BY NAVAL SHIPS AND AIRCRAFT

Naval ships sailing independently that must send a distress message should send a normal naval message, using an appropriate precedence. When the need for assistance outweighs security considerations, naval ships may send unclassified distress messages on appropriate distress frequencies. When in company, ships will transmit the distress message over a tactical circuit to the OTC, who will take necessary action.

Naval aircraft will use normal tactical or en route military/civil in flight circuits for distress communications. If difficulty is experienced in communicating on these frequencies, aircraft in a distress or emergency situation will shift to the aeronautical emergency frequency (121.5 MHz). If only UHF equipment is installed, they will shift to survival craft frequency (243.0 MHz). Regardless of the circuit used, the pilot of an aircraft should not hesitate to declare a state of emergency. The distress is canceled when the emergency is over.

11.3.1 Distress Watches Afloat. The 1974 Safety of Life At Sea Convention, as amended, affects all U.S. passenger and cargo ships of 300 gross tons operating in international waters. Among the provisions implemented by this convention is the requirement that all ships must maintain a continuous radiotelephone watch on 2182 kHz and Channel 16 (VHF). Use of these frequencies in the nonsecure voice mode by U.S. Navy ships will provide a reliable callup capability with merchant ships in emergency or distress situations. During normal operations, fleet units or a task force guard ship will maintain a listening watch on 2182 kHz and Channel 16 (VHF) to provide an emergency callup capability between merchant ships and U.S. Navy units.

FREQUENCY	USAGE
500 kHz	INTERNATIONAL DISTRESS AND CALLING FREQUENCY for telegraphy. Send on A2 or A2H emission and receive on A2 and A2H emission. To be used for this purpose by ships, aircraft, or survival craft having equipment in the 405 to 535 kHz band when requesting assistance from the maritime services. May be used for the distress call and distress traffic, and also for URGENCY and SAFETY signals or messages.
2182 kHz	INTERNATIONAL DISTRESS AND CALLING FREQUENCY for mobile radiotelephone stations, survival craft, and emergency position indicating radio beacons having equipment in the 1605 to 4000 kHz band when requesting assistance from the maritime service. Use J3E or A3H emission to send between U.S. Navy units and merchant ships in crisis/emergency situations.
121.5 MHz	INTERNATIONAL AERONAUTICAL EMERGENCY FREQUENCY FOR AIRCRAFT and those aeronautical stations primarily concerned with the safety and regularity of flight along national or international civil air routes and having equipment in the 118 to 136 MHz band. Mobile stations of the maritime mobile service are authorized to communicate on this frequency, for safety purposes, with stations of the aeronautical mobile service (class A3 emission only).
156.8 MHz	For use internationally by the MARITIME MOBILE SERVICE for calling, reply, and safety purposes. Used for distress and URGENCY signals. Emission limited to F3.
243.0 MHz	For use internationally by SURVIVAL CRAFT STATIONS and equipment used for survival purposes. Emergency position-indicating radio beacons may also operate on this frequency. Also designated by military authorities for airborne and/or ground unit DISTRESS EMERGENCY and assigned exclusively for this purpose by NATO.

Figure 11-1. Distress/Emergency Frequencies

Afloat and maritime patrol aircraft units will maintain flight communications on assigned tactical, control, coordination, and reporting circuits.

All ships, or at least one ship in a task force, must guard 2182 kHz (2183.4 USB), Channel 16 (156.8 VHF-FM), and when in U.S. navigable waters, monitor Channel 13 (156.65 VHF) as mandated by U.S. law. These frequencies may be used for distress, urgency, and safety purposes. Information regarding the use of 2182 kHz as an emergency callup frequency is provided to all U.S. flag and U.S. owned merchant ships by the U.S. Maritime Administration.

11.4 DISTRESS WATCHES ASHORE

Naval activities do not normally maintain distress watches ashore. All naval air activities maintaining a VHF/UHF tower communications capability will guard 121.5 MHz and 243.0 MHz.

11.5 DISTRESS TRAFFIC

Distress traffic includes all signals/messages relating to the immediate assistance required by the unit in distress. It has priority over all other traffic. Any station that hears a distress call shall immediately cease all transmissions capable of interfering and shall continue to listen on the frequency on which the distress call was heard. The call is general and not usually addressed to a particular station. Acknowledgment is not to be given until the complete transmission has been received.

The control of distress traffic is the responsibility of the station in distress, which may delegate such control. The controlling stations may request silence either from all stations in the area or from any station that interferes.

A U.S. Navy ship that has heard an unanswered distress message will attempt to acknowledge receipt. In responding to distress situations, commanding officers will advise the ship in distress that the call has been heard and of the assistance that can be provided. If not in a position to render assistance, the ship will be advised that the distress message has been received and is being forwarded to appropriate Navy and Coast Guard authorities. In all circumstances, the intercepted distress message will be immediately readdressed to the appropriate fleet command, unified commander, and COMLANTAREA COGARD PORTSMOUTH VA or

COMPACAREA COGARD ALAMEDA CA, with amplifying data, as applicable. The ultimate decision to answer a distress call, however, rests with the commanding officer or the senior officer present, as appropriate, and is governed by paragraph 0925 of U.S. Navy Regulations, 1973, and constraints that may be imposed by the tactical situation.

11.6 EMERGENCY COMMUNICATIONS SERVICE

The emergency communications service includes all Navy-Marine Corps MARS stations. It provides for emergency communications to communities in the event normal communications are disrupted by natural or other disaster. A communications emergency exists either when normal communication means are inoperative or when, even though operative, they cannot handle the traffic load.

The Navy-Marine Corps MARS emergency communications facilities coordinate with communications agencies and other interested parties to render the most effective service (see Chapter 32).

11.7 EMERGENCY RELAY OF TRAFFIC

In the event of a disaster that results in a total loss of commercial communications service, naval commanders may accept traffic for relay through defense and naval communications systems without charge or accounting. Such messages should be retained because of their historical and legal value.

CHAPTER 12

Casualty Reporting

12.1 COMMUNICATION CASUALTIES ON FLAGSHIPS

Prior to commencement of operations, the commander shall designate in the communication plan the ship(s) that is (are) to assume the commander's communications guard in the event of a flagship casualty. If communication casualties occur in the flagship, the commander shall, when practicable, direct the designated ship(s) to assume guard (or net control) on the affected circuits until the casualties have been repaired. The commander shall inform the immediate tactical senior and units of the command, if communications condition and security considerations permit, and shall also inform them when partial or complete communications have been reestablished.

If casualty to the flagship results in complete communications failure, the predesignated ship(s) shall inform the second in command immediately, if feasible, and the remaining units as soon as possible.

All ships and commands shall be on the alert to initiate additional actions necessary to provide continuity of communications.

12.2 COMMUNICATION CASUALTIES ON OTHER SHIPS

Ships assigned communication functions are to inform their immediate tactical superior at once if they become incapable of carrying out guardship duties.

Individual ships experiencing communication casualties shall inform their immediate tactical superior at once of the circuits affected and the estimated time to make repairs.

Officers assuming tactical command of a unit incident to damage or sinking of the flagship of the regularly assigned commander shall immediately assume the communication responsibilities of that unit and establish watches on the prescribed circuits and networks.

12.3 COMMUNICATION CASUALTIES ASHORE

Casualties to communication systems ashore shall be reported in accordance with NWP 1-03 (series) and major claimant instructions.

CHAPTER 13

Special Situations

13.1 COMMUNICATIONS MANAGEMENT DURING CRISIS

In times of crisis, certain actions are usually taken to ensure communications connectivity and available bandwidth are used to best advantage. These actions include Minimize and the use of alternate means of delivery for routine and sometimes for priority traffic.

13.1.1 Minimize. In an emergency or crisis situation, C^4I systems can become severely overloaded. It is then necessary to reduce voice/facsimile, data, and record communications so that essential traffic may be efficiently handled. Setting Minimize is the tool normally used to do this. Minimize requires the clearing from military circuitry of all nonessential traffic. Minimize may also be set for certain operating forces when an EMCON condition is set and during major fleet exercises or real-world operations. It may be set for a particular geographic area or for all military traffic worldwide. It may be imposed on record traffic only, voice (including use of voice circuits for fax or modem operations) only, or on both.

Minimize is imposed on all system users. Enforcing it is a command responsibility. Commanding officers will reduce voice/fax/record/data traffic, as required, during Minimize and will not originate messages to be held for release until after Minimize is lifted.

Minimize may be imposed by JCS or unified commanders on all users of the military communications system under their aegis. Additionally, CNO, Fleet CINCs, and area coordinators may impose Minimize on Navy users of communication systems. (Fleet CINCs may delegate this authority to numbered fleet commanders). Subordinate commanders may impose Minimize only with prior permission from one of the foregoing. Additionally, messages reiterating the setting of Minimize by competent authority should not be originated unless absolutely necessary.

Those authorized to release messages during Minimize must be kept to a minimum and should be specifically designated by the commanding officer.

When Minimize is imposed on voice communications, use of voice circuitry for conversation, facsimile, or data transmissions shall be limited to essential traffic. Conversation length should be held to a minimum.

NTP 3 provides details of sending messages during Minimize.

13.1.2 Precedence Assignment. Precedence indicates the required speed of delivery to the addressee, the order of handling and delivery by communications personnel, and the order in which the addressee should note the message. Speed of service objectives are found in NTP 3 and ACP 121.

The originator determines precedence by the textual content and the time factor involved. Command attention is constantly required so that the selection of correct precedence by both record and voice users prevents degradation of communication systems. Routine precedence will be used to the maximum. No higher than Priority precedence will be used for administrative traffic, except that those messages reporting death or serious illness will be assigned Immediate precedence. The precedence selected for DSN calls is governed by the same criteria as that of record traffic. Precedence abuse of voice circuitry is usually the bigger problem.

13.1.3 Alternate Means of Delivery and Delayed Delivery. In times of crisis, record communication channels can become clogged despite the best efforts of all. When this happens, fleet commanders, in conjunction with their area NCTAMS, may activate a message review board to actively review all queued traffic and divert the less essential traffic for delivery at a later time or by alternate means.

13.2 USE OF COMMERCIAL COMMUNICATIONS FOR OFFICIAL BUSINESS

In general, units can meet their communication needs using either military circuitry or circuitry commercially leased or otherwise provided by DOD. Very occasionally, especially when deployed, units may be required to use other kinds of commercial connectivity for official business, e.g., INMARSAT. Funding for this should generally be provided by the using unit.

13.3 USE OF PERSONAL COMMUNICATIONS EQUIPMENT ABOARD OPERATIONAL PLATFORMS

There is no outright ban on the use of personal communications equipment aboard naval platforms. Such use, however, must be specifically authorized by the commanding officer or the aircraft commander, as required, and shall not be used during EMCON. Persons using personal communications equipment are not to divulge classified information or sensitive but unclassified information, such as ship movements, over this equipment, nor is this equipment to be used to unilaterally and unofficially pass information, such as notification of death or serious illness, to next-of-kin. News of this nature must be broken to family members as sensitively, compassionately, and with as much available detail as possible by appropriate Navy representatives.

13.4 USE OF U.S. ASSETS IN SUPPORT OF NATO OR ALLIES

U.S. law specifies certain conditions, such as reimbursement, for the use of U.S. communication assets by NATO (including U.S. components) or Allied forces or the use of Allied assets by U.S. forces. In general, use of these assets is arranged through Memoranda of Understanding or other official agreements that set forth such things as conditions of use, standard operating procedures, and reimbursement requirements. Commanders and commanding officers should consult the appropriate fleet commander or OPNAV/N61/staff if they need advice on these matters.

13.5 AMERICAN RED CROSS TRAFFIC

The American Red Cross is entitled to use, without charge, the facilities of naval communications for sending and receiving messages regarding Red Cross administration and emergency welfare in connection with Red Cross activities, functions, and duties as prescribed in Navy Regulations.

In each specific case, this privilege is subject to the approval of the commanding officer having cognizance of the communications office to which the message is presented for transmission. They shall refuse to accept such messages for transmission or relay when, in their opinion, the handling of such messages would be detrimental to naval administration or operations. Red Cross messages shall not be accepted for transmission unless delivery can be effected entirely by naval and/or defense information systems circuits, except as provided below.

Red Cross messages are handled as Class B messages and normally are in plain text. Red Cross messages concerning death, serious illness, or critical injury to U.S. military personnel or their immediate families may be assigned a precedence up to and including Immediate. All other Red Cross traffic handled by a naval communications facility during a civilian disaster, where the Navy is assisting, may be given equal precedence with military traffic at the direction of the senior officer present at the scene of the disaster.

When emergencies or disasters occur involving relief work by the Red Cross, the senior officer in the area affected may forward Red Cross messages over naval circuits, whether in the interest of armed forces personnel or not, provided such messages will not involve other line charges and are handled as directed. If other line charges are involved, commanders should take appropriate action as deemed necessary to ensure delivery, advising CNO WASHINGTON DC//N6// of the pertinent details of the action.

13.6 PASSING CLASSIFIED TRAFFIC USING STU-III AND FAX OR MODEM

There are situations in which classified traffic may be passed by using a STU-III in combination with a fax or modem, e.g., to support a traveling flag officer. Care must be taken to ensure that the key used in the STU-III is equal to or of higher classification than the traffic being passed and that the material is handled and stored in accordance with all governing directives.

Part III — Command Responsibilities and Unit Communications

CHAPTER 14

Command Communication Responsibilities

14.1 READINESS

Maintaining unit communications at the highest possible level of readiness requires that the commanding officer and all persons charged with communication responsibilities understand the capabilities and limitations of these systems. Commanding officers are to exercise oversight of these systems and of the personnel who operate them. They are to ensure that, when necessary, required corrective action, on both maintenance and procedural matters, is taken as expeditiously as possible.

Officers in command of multiple units shall control and coordinate communications, including frequency assignment, for the forces under their jurisdiction. They shall exercise adequate supervision over subordinate units to ensure efficient communications at all times.

14.1.1 Predeployment Readiness. Ships, squadrons, and other deploying units must be in a state of maximum practical communications readiness. This includes both material and administrative aspects of communications readiness. Commanding officers and type commanders are responsible for ensuring that deploying units hold all applicable CMS material (see Chapter 29), as well as other communication publications, directives, and instructions. Regional NCTAMS can furnish training support CAT visits upon request and assistance in determining communication procedures, assets, and services available in deployment operating areas. Chapter 15 and Appendix C contain additional information on predeployment communications preparedness and training.

14.2 SECURITY

It goes without saying that communications security is a command responsibility. Commanding officers should be particularly sure to exercise appropriate command-level attention to the two items listed below.

14.2.1 CMS Accounts. Proper oversight of CMS accounts and holdings and of personnel assigned to CMS duties is a command responsibility. CMS-1, maintained by the CMS Custodian, is the best source for information on the CMS system and COMSEC requirements in general.

14.2.2 STU-III Accounts. Commanding officers shall also exercise appropriate oversight of the command's STU-III account holdings and personnel assigned to STU-III account duties. CMS-6 is the source book for information on STU-III accounts.

14.3 EMERGENCY ACTION PLAN

Each command that handles classified information is required to develop an EAP for the protection of classified material in case of a natural disaster, civil disturbance, or enemy action. This plan may be prepared in conjunction with the command's disaster preparedness plan but must be detailed with specific procedures and responsibilities, including a comprehensive listing of the locations of classified material within each responsible area. The EAP will also address the emergency destruction of classified material and provide instructions on when and how destruction will be carried out.

The EAP must provide for the protection of classified information in a way that will minimize the risk of loss of life or injury to personnel. For instance, the EAP should call for immediate evacuation in case of fire and not require that all classified material be properly stored before leaving. Placing a perimeter guard and controlling access to the area will provide sufficient protection and reduce casualty risk.

Additional information on EAP development, content, and the requirement for periodic emergency destruction drills is contained in OPNAVINST 5510 (series) and CMS-1.

14.4 REPORTING COMMUNICATION CASUALTIES

Casualty reports will be submitted in accordance with NWP 1-03.1 (series) and supporting directives,

including type commander or major claimant (for shore activities) directives.

Information pertaining to communication casualties affecting flagship communications are contained in Chapters 12 and 15.

14.5 TRAINING

Communications training may be:

1. Formal, i.e., training at Navy schools or at factory-level facilities or training provided at the unit or type commander/claimant level by Navy instructors or vendor representatives.

2. Informal, i.e., training conducted at the command level by command members or visiting teams, such as a CAT or CRAT.

Commanding officers are responsible for ensuring their communications personnel receive adequate training of both varieties. They should pay particular attention to ensure that communications personnel receive adequate training on the operation and maintenance of any new communication systems installed aboard the command, either permanently or for ad hoc purposes.

14.6 COMMANDING OFFICER'S RESPONSIBILITIES FOR ORGANIZATIONAL MESSAGES

Organizational messages are the means by which a commander or commanding officer makes his/her will known and, as such, exercises the voice of command. Any organizational message is assumed to speak for and with the authority of the commander of the unit that originated it.

It is the responsibility of the commander or commanding officer to ensure that proper measures are in place to allow only those individuals authorized in writing by the commander or CO to release official organizational messages.

14.6.1 Authority to Release Organizational Messages. The authority to release organizational messages may be delegated by officers in command only, or in the case of flag officers, their chiefs of staff. Delegation of releasing authority should be kept to a minimum to ensure that organizational messages speak for the command. Authority to release messages during Minimize should be reduced to a bare minimum.

14.7 BRIEFINGS AND DEBRIEFINGS

Afloat staffs and type commanders will conduct debriefings of ships returning from deployment and briefings to ships prior to deployment to ensure valuable communications operational information acquired by deployment experience is made available to other units. Serious communication problems encountered are to be reported to COMNAVCOMTELCOM WASHINGTON DC//00/N3// via the chain of command, keeping the AOR regional NCTAMS informed.

14.8 OTC AND SOPA COMMUNICATIONS RESPONSIBILITIES

The OTC, Senior Officer Present Afloat (or Ashore), or other competent authority shall take appropriate action to ensure all prescribed instructions concerning communications are enforced. The OTC is responsible for the tactical employment of communications within his/her force.

CHAPTER 15

Unit Communications

15.1 GENERAL RESPONSIBILITIES FOR COMMUNICATIONS

A unit's requirements for communications depend upon the nature of the unit's mission and, if the unit is afloat or deployed, upon its projected operations.

The unit commanding officer is at all times and under all circumstances responsible for the communications of their unit, except when a flag officer is embarked and has assumed jurisdiction over all communication functions.

15.2 UNIT COMMUNICATIONS OFFICER

The unit communications officer is responsible for the organization, supervision, and coordination of the unit's communication requirements.

15.3 COMMAND SHIP COMMUNICATION RESPONSIBILITIES

The term "flag," as used herein, includes commands such as groups, squadrons, and divisions (i.e., amphibious readiness group, destroyer squadron, etc.) whether or not the commander is actually a flag officer.

In flagships, the embarked commander assumes jurisdiction over communication functions. The flag communications officer will be responsive to ship, flag, and embarked unit communication requirements. This does not relieve the commanding officer of the flagship from responsibility for proper internal handling of messages within the ship.

The flag communications officer is directly responsible to the chief of staff for the efficiency of communications within the command, including command and staff functions. In the command function, they ensure that optimum communication support is provided. The staff function refers to their responsibility for providing adequate communications service to the flag officer and staff.

When a flag or multiple staff is embarked, the ship's communications officer, communications watch officers, and enlisted communications personnel may be ordered by the senior staff flag to additional duty in that flag's communications division. These personnel shall be directly responsible to the senior flag's communications officer for operation of the flag communications function. Navy Regulations and NTP-4 provide additional information on this relationship. The ship's communications officer will report to the senior flag's communications officer in fulfilling these responsibilities. They will serve as the point of contact for matters pertaining to the handling of ship and staff messages.

15.3.1 Duties of Shipboard Communications Personnel. Radiomen and comparable personnel assigned to communication suites aboard afloat units should not be assigned to noncommunication duties. Using communications watchstanders for quarterdeck watches or security team members in port or at sea impairs communications readiness and is not recommended.

15.4 PREDEPLOYMENT READINESS

Deploying units must be in a state of maximum practical communications readiness. Fleet commanders shall prepare amplifying instructions to those contained herein whenever necessary.

Type commanders shall ascertain the readiness level of deploying units and initiate remedial action well in advance of deployment. They shall ensure that deploying units hold all appropriate publications, directives, and instructions, as determined by fleet commanders, especially those that may be required for out-of-area or special operations.

The regional NCTAMS shall furnish training support, CAT visits, and communications information, as practicable. Appendix C contains suggested minimum predeployment communications check-off and training lists.

15.5 HARMFUL INTERFERENCE

Harmful interference shall be reported in accordance with the MIJI instructions contained in OPNAVINST C3430.18 Series and NTP-6, using USMTF format as described in NWP 1-03.19. Ensure CNO WASHINGTON DC//N6//, NAVEMSCEN WASHINGTON DC//, COMNAVCOMTELCOM WASHINGTON DC/N3/N32//, COMNAVSPACECOM DAHLGREN VA//N32//, appropriate fleet commander, and area NCTAMS or NAVCOMTELSTAs are included as information addressees.

15.6 ELECTROMAGNETIC INTERFERENCE

Shipboard radio frequency compatibility problems become more serious in direct proportion to the number of electronic systems simultaneously in use, their outputs, transmission rates, and receiver sensitivities. Harmful mutual interference can be caused by unwanted emissions (or their byproducts) that may block and distort a portion of the signal at the receiver. Communications personnel can reduce self-generated interference and its effects by strict adherence to equipment/system operating procedures and maintenance programs. It is essential that frequency separation criteria be determined for each ship and then observed in the development and use of frequency plans. Additional information can be found in ACP-190 or through the regional JFMO.

Electromagnetic interference of this nature should be identified whenever possible and, if it cannot be readily rectified, shall be reported to the area NCTAMS and NAVCOMTELSTA, COMNAVSPACECOM DAHLGREN VA//N32//, COMNAVCOMTELCOM WASHINGTON DC//N3//, and NAVEMSCEN WASHINGTON DC via the chain of command. The report format is as follows:

1. Equipment affected by interference
2. Allocated frequency band or assignment of affected equipment
3. Equipment causing interference and its location
4. Allocated frequency band assigned to interfering equipment
5. Probable cause of interference (e.g., harmonic intermodulation, etc.)
6. Extent of impairment of operational capability of affected equipment
7. Corrective measures taken to combat interference
8. Effect of corrective measures
9. Additional remarks.

15.7 QUALITY CONTROL MONITORING

Quality control provides the means for monitoring and determining the performance of communications systems. Quality control equipment ranges from elaborate shipboard and shore installations, which provide for operator-monitoring of circuit performance, to simple test equipment on small ships. A dynamic quality control program can provide a high degree of efficiency and effectiveness by anticipating faults and casualties. Simply stated, quality control monitoring is the performance of scheduled, logical checks that will ensure continuous, optimum performance of shipboard or shore station communication systems and, in many cases, prevent outages before they occur.

Specific guidance for quality control is provided in Defense Information Systems Circular 310-70-1 and COMNAVCOMTELCOMINST 2313.1 series. NAVSHIPS 0967-LP-376-2010 refers to shipboard transmitters. Additionally, at the conclusion of each regular overhaul, radiation patterns for each antenna shall be documented and retained aboard for reference purposes.

15.8 UNIT COMMUNICATIONS ADMINISTRATION

The efficient administration of communications requires that key personnel, such as the radio officer, communications officer, and, ultimately, the commanding officer, be kept informed continually of communication requirements. They must have sufficient background information on the operation to maximize the utility of available assets.

15.9 SUPPORTING COMMUNICATION PLANS

Supporting communications plans or orders shall be sufficiently detailed to ensure comprehensive coverage for the task assigned. Duplication of the contents of senior documents shall be kept to a minimum. For the purpose of this write-up, the terms “senior” and “subordinate” communication plans are used to show the relationship between various related directives that are mutually supportive (i.e., the PACFLT COI is the source of and senior to the Battle Group OPTASK Communication Plan, which is the source of and senior to the AAW Screen Unit Communication Plan, etc.).

Reference to such plans will suffice assuming the senior plan is held by units using the supporting plan. These plans shall be written in clear, logical language to preclude unnecessary requests for amplification. Requirements for extensive and detailed reports should be kept to a minimum. Plans will prescribe the period that the plan is effective and will be disseminated well in advance of the deployment or operation. They shall be disseminated not only to the forces participating in the operation; but also to supporting forces and the appropriate NCTAMS and NAVCOMTELSTAs. Formats for communication plans and annexes shall be in accordance with relevant joint, naval, or coalition planning documents.

15.9.1 Exercise Analysis. OPORDs, including CPXs, shall include provisions for post-exercise analysis of message traffic flow characteristics and communications discipline. These analyses are used to determine the degree of responsiveness and the reliability of these communication systems in supporting joint and naval exercises, operations, and combat. If a period of six months elapses without conduct of an exercise or CPX, commanders shall conduct spot check analyses, the depth and extent being determined by the processing resources available and the demonstrated need of the unit being inspected.

15.10 CLASSIFIED TRAFFIC IN THE CLEAR

Under those emergency conditions in which classified traffic must be transmitted in the clear, each message will be individually authorized by the commanding officer. The word, "CLEAR," will be transmitted at the beginning of the text, in lieu of the classification, and the phrase, "RECEIVED IN THE CLEAR," will be used to identify these messages. Messages so received will be handled as Confidential. They shall not be readdressed but may be quoted in other messages of Confidential or higher classification. See ACP 121 for additional information.

Directional visual communications are authorized between dawn and dusk for transmission of Confidential messages by Navy afloat units when at sea and out of range of land and/or non-U.S. Navy units. Directional infrared units shall be used at night. The lens filter provides no security and the flashing light is easily observable out to the horizon along the line of sight. Commanding officers must give careful consideration to the necessity for using these procedures since there is always the possibility of interception by unauthorized persons. Such messages will be handled as if received by secure means. For visual communications, the actual classification must be inserted in the message. "CLEAR" is to be used only for messages transmitted by radio or over uncovered telephone lines. SPECAT and LIMDIS messages are excluded from the provisions of this section.

Any transmission of classified information passed without cryptographic protection that does not meet the foregoing shall be reported as a possible compromise in accordance with OPNAVINST 5510.1 (series) or ACP 121 US SUPP-1.

15.11 USE OF THE INTERNET BY NAVY ACTIVITIES

Naval units may establish and maintain information servers and services on the Internet, including World Wide Web home pages with links to other pages, provided they support legitimate, mission-related activities of the Navy and Marine Corps and are consistent with prudent operational and security considerations; however, links to specific vendors who are selling products and/or services to the U.S. Government must be avoided. Complete information on policy concerning unit Internet operations is contained in OPNAVINST 2710, Navy Local Area Net Policies, and in OPNAVINST 5239.A (series), ADP Security Policy.

15.11.1 Conditions for Unit Internet Operations. The following conditions pertaining to unit Internet operations apply.

1. Commanding officers must ensure that information provided on any of their information servers connected to the Internet does not contain classified information, sensitive but unclassified information, privacy information, or information that could enable the recipient to infer classified or sensitive but unclassified information either from individual segments or from the aggregate of all information provided.

2. Information must be professionally presented, current, accurate, factual, and related to the command's mission.

3. Each Web home page will have a designated author or maintainer who will be responsible for the content and appearance of that page. The individual's name, organizational code, organizational phone number, E-mail address, and the date of the last review will be included in the source code for the page.

4. Publicly accessible newsgroups, bulletin boards, and E-mail mailing lists that are operated by the

command should also reflect a high level of professionalism. Commanding officers should establish periodic reviews of the content of postings to ensure that they do not bring discredit to the command or the Department of the Navy.

5. All naval information systems with servers, including Web servers that are connected to unclassified, publicly accessible computer networks, such as the Internet, will ensure that appropriate security safeguards, such as firewalls, are employed as necessary. DOD firewall policy is still under development.

6. All information servers with connections to the Internet must have formal commanding officer or designated approving authority authorization to operate. All systems must receive security accreditation and authorization to operate prior to being put in service.

7. Commanding officers should be alert to problems that can develop if demand for Internet services consume significant network bandwidth. This can seriously degrade network performance for other systems sharing network components and degrade or deny internal users access to needed information.

15.12 EMISSION CONTROL

EMCON is control of all electromagnetic and acoustic radiations, including communications, radar, EW, and sonar. During its imposition, no electronic emitting device within designated bands, including personal communication devices, will be operated unless absolutely essential to the mission. Policy for using EMCON will be established by fleet commanders based on enemy capabilities for interception versus use of own force electromagnetic systems. General or specific restrictions may be imposed based on operational, intelligence, or technical factors for any particular area. The OTC or his designated subordinate commander is responsible for imposing EMCON. The degree of EMCON is determined by the force mission, tactical situation, and frequency band propagation characteristics of the equipment concerned.

NWP 3-51.1 provides information concerning ELSEC support to EMCON, describes the procedures for implementing EMCON, and provides rules for adjusting the degree of EMCON for maximum tactical advantage. The NAVSHIPS Technical Manual gives guidance for use of EMCON when radiation hazards (RADHAZ)/hazardous electromagnetic radiation to ordnance (HERO) conditions prevail.

5.12.1 Employment of EMCON. Continued training is essential for secure fleet communications. Commanders will establish maximum EMCON, particularly below 30 MHz, as standard procedure on fleet exercises and operations. Successful new EMCON procedures will be forwarded to CNO (N2/N6) .

Even the most secure communications practices during EMCON reduce, but do not eliminate, the susceptibility of the fleet to identification. When electromagnetic emissions are emanating from the unit, it can be assumed that each transmission will be immediately detected and the position of the transmitting ship will be known to the enemy. The risk of detection is significantly reduced when using LPI/LPD systems such as EHF.

15.13 UNAUTHORIZED TRANSMISSION

No person shall knowingly or willfully originate, accept, transmit, deliver, or cause to be delivered a spurious message or one falsely purporting to have been received by naval communications. Also, the use of profanity and obscenity in radio transmissions is prohibited and violators are subject to charges under the UCMJ. This is essential both to circuit discipline and compliance to Federal law.

Unauthorized transmissions are not usually accompanied by call sign identification; therefore, every effort shall be made by communications personnel in receipt of such transmissions to identify the violating station. Tape recordings, accurate logs, operator characteristics, exact frequency measurements, and direction finding bearings all aid in the identification of unknown stations.

Whether or not positive identification can be made, all incidents involving unauthorized transmissions, as noted above, shall be reported by the receiving or monitoring command to the appropriate Fleet CINC, with information copies to COMNAVSECGRU. All identifying information shall be enclosed with the report.

15.14 BEADWINDOW

Beadwindow is a real-time procedure that brings to the immediate attention of circuit operators the fact that an EEFI disclosure has or may have occurred. The procedures for BEADWINDOW are contained in NTP-4.

Part IV — The Components of the Communications System

CHAPTER 16

Transmission Media

16.1 THE RADIO FREQUENCY SPECTRUM — SERVICES AND EQUIPMENT BY SPECTRUM SEGMENT

Communication is rapidly transitioning toward virtual networks and seamless, completely transparent carrier services capable of high-speed, multimedia data transfer. This transition carries across the entire RF spectrum, pointing to satellite communications, backed up by other long-haul communication links, as the cornerstone of future information transfer architectures. Figure 16-1 depicts present naval use of the RF communication spectrum.

16.1.1 Extremely Low-Frequency Communications. The Navy uses the ELF portion of the RF spectrum as a strategic communications asset in support of the submarine broadcast system. ELF permits submarines to remain covert and acts as a "Bellringer" to notify the submarine to come shallow to copy a higher data-rate broadcast (e.g., SSIXS).

16.1.1.1 Characteristics, Advantages, and Limitations. The Navy has one ELF system. It is comprised of three segments. The first two segments consist of two high-power shore transmitter sites, located approximately 150 miles apart at Clam Lake, WI and Republic, MI. A message input segment is the third segment of the system. The capability to key the broadcast is resident at both COMSUBLANT, Norfolk, VA and COMSUBPAC, Pearl Harbor, HI. This unique communication system is designed to transmit short alerting messages to submarines operating far below the ocean surface. ELF frequencies in the 40 to 80 Hz range were selected for their global signal propagation and ability to penetrate seawater to depths several hundred feet below the surface. In addition to the inherent covertness this communication system affords, it also provides the submarine commanding officer with operational flexibility to remain at required mission depth and speed.

16.1.1.2 Systems. The single shore ELF system is controlled by COMSUBLANT, Norfolk, VA and COMSUBPAC, Pearl Harbor, HI, who share BCA/ALT BCA functions. The BCA injects messages generated by SUBOPAUTHs into the ELF system via the C^2 processor known as the message entry operator terminal. These messages are relayed to the transmit sites by dedicated communication links, usually leased telephone lines, called intersite links. At each transmitter site, the messages received over the intersite links are decrypted and input into the message processing element. The message processing element develops the ELF broadcast by encoding, queuing, and encrypting the messages to be transmitted. The transmit processor element produces the drive signals for the power amplifier and antenna. A simplified block diagram of the ELF system is shown in Figure 16-2.

16.1.2 Very Low-Frequency and Low-Frequency Communications. VLF and LF portions of the RF spectrum provide the primary means of reliable communications to strategic and tactical submarines served by the submarine broadcast system. These systems are generally typified by huge antennas requiring extensive real estate and extremely high-power transmitters.

16.1.2.1 Characteristics, Advantages, and Limitations. The Navy shore VLF/LF transmitter facilities transmit a 50 baud submarine C^2 broadcast that is the backbone of the submarine broadcast system. The VLF/LF radio broadcast provides robustness (i.e., improved performance in atmospheric noise), availability, global coverage, and has seawater penetrating properties. The submarine VLF/LF broadcasts operate in the 14 to 60 kHz frequency range.

16.1.2.2 Systems. The submarine broadcast system consists of four high-power, multichannel MSK fixed VLF sites and six multichannel LF sites located worldwide. Figure 16-3 lists the VLF/LF site locations.

Figure 16-4 shows a simplified block diagram of the VLF/LF transmit system. Submarine VLF/LF broadcasts are generated by the BCA/ALT BCA from messages created locally by the C^2 processor, the SSIXS processor, or accepted for relay by the SUBOPAUTH.

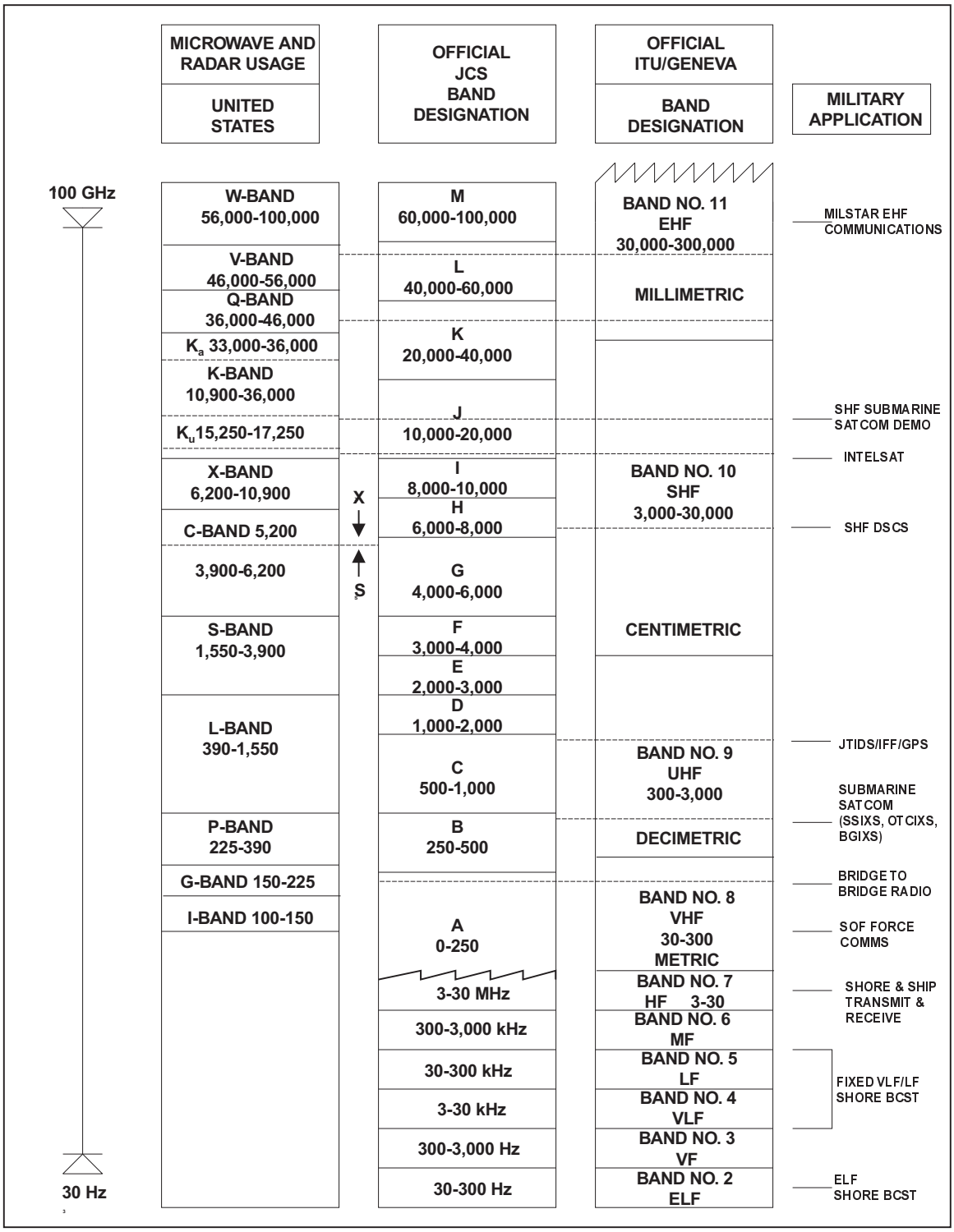

Figure 16-1. Radio Frequency Communications Spectrum

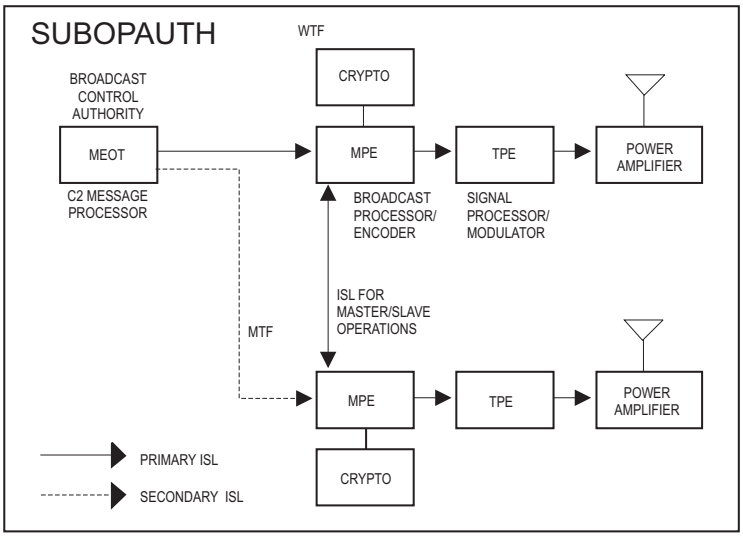

Figure 16-2. ELF Transmit System

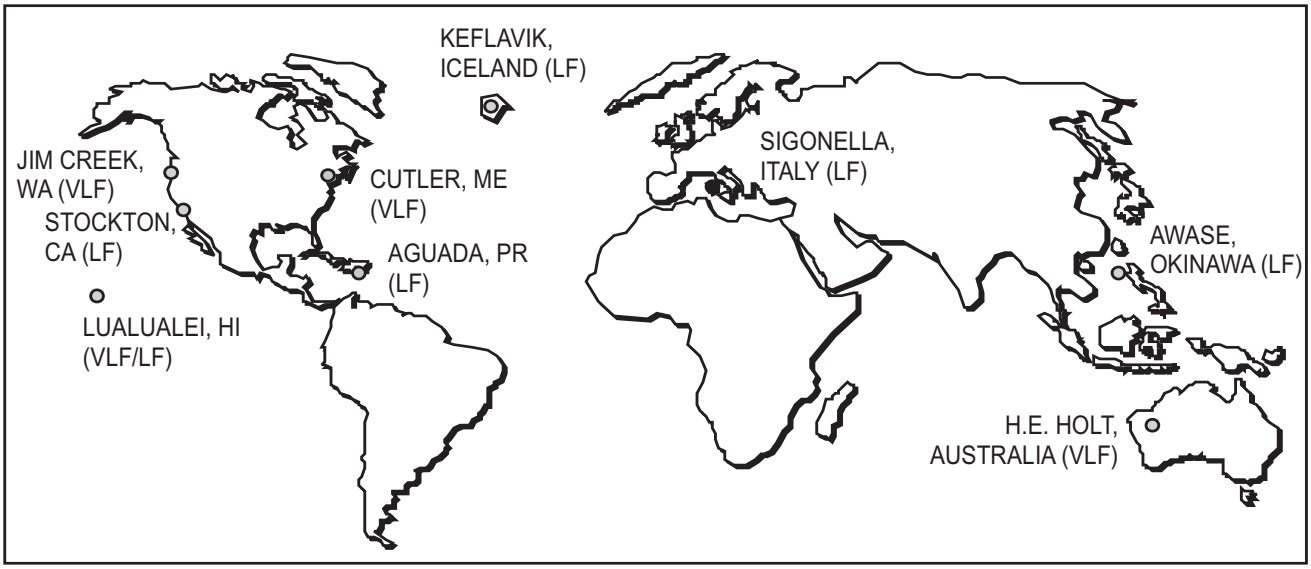

Figure 16-3. VLF/LF Site Locations

BCAs/ALT BCAs are connected to the transmitter sites by dedicated intersite links with the ability for JCS and USSTRATCOM to seize the BCA at any time for EAM dissemination. At each of the transmitter sites, messages received over the intersite links are input into ISABPS and then sent to the VERDIN transmit terminal at the start of the next scheduled 2-hour broadcast. The VERDIN transmit terminal multiplexes, encrypts, encodes, and modulates up to four 50 bps submarine broadcast channels into VLF/LF RF signals that are amplified and radiated by the VLF/LF transmitter and antenna.

16.1.3 High-Frequency Communications. HF long-haul communications have historically been the backbone of shipboard communications. The advent of satellite communications in the 1970s relegated HF communications to a secondary role, unintentionally leading to a gradual degradation in Navy HF communications needed to meet current and future peacetime and contingency communication requirements. There is renewed interest in HF communications based largely on the growing awareness of the vulnerability of satellite communication systems. The inherent versatility and survivability of HF systems, coupled with technological

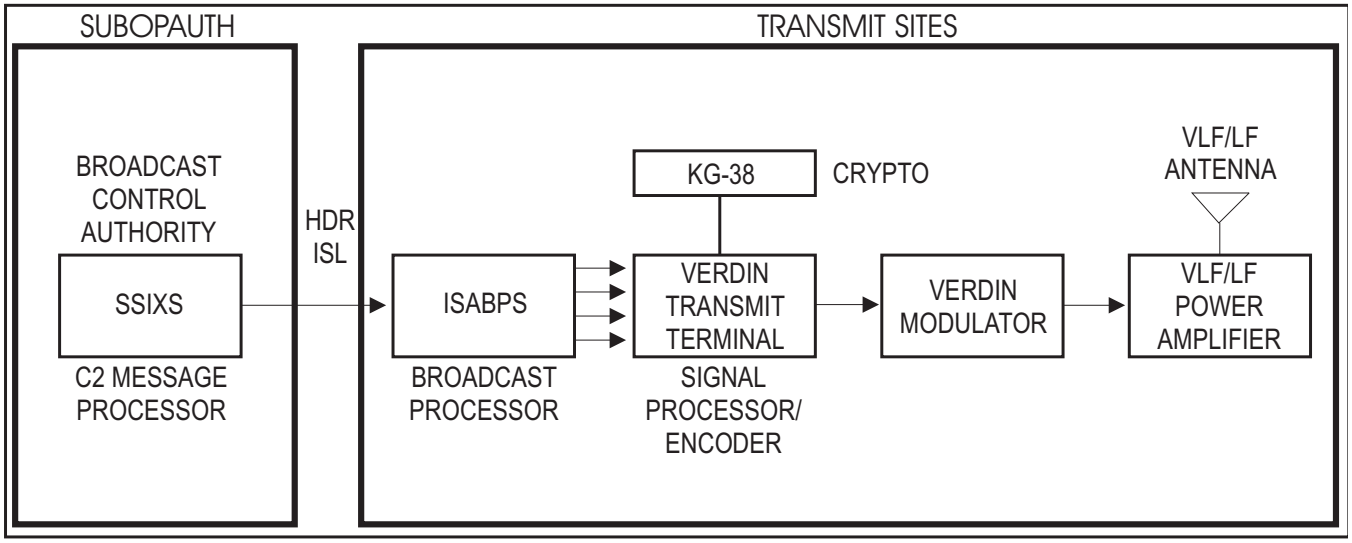

Figure 16-4. VLF/LF Transmit System

advances in this area, has renewed interest in the HF spectrum as an important communications media for the U.S. Navy.

HF coverage is provided to ocean areas during peacetime, wartime, and contingencies. HF radio ensures the availability of communications to those units not satellite capable, units operating outside satellite coverage areas, and units experiencing satellite communications equipment limitations or outright failure.

16.1.3.1 Characteristics, Advantages, and Limitations. HF signals offer a range of characteristics that make them uniquely capable of long-distance communications, albeit with some limitations to their general use. HF signals propagate via ground waves and sky waves. While ground waves afford short-range communications, they are usually noisy by nature. On the other hand, because of ionospheric reflection, sky waves propagate long distances with relatively small losses, but are subject to multipath fading.

Among its disadvantages, HF requires higher power transmitters when compared to communications in higher frequency ranges, is susceptible to DF, is vulnerable to HEMP, and is open to jamming. However, new technology (e.g., PSK waveform and ALE) has addressed some HF shortcomings by increasing HF data rates, improving point-to-point link establishment, employing adaptive frequency selection, providing antijam capabilities, and utilizing low-probability-of-intercept techniques.

HF communication systems are less costly than satellite systems and, with the addition of recent technological improvements, offer effective alternatives for ship-to-shore and battle group communications.

16.1.3.2 Policies and Procedures for Requesting HF Support. Ship-to-shore HF terminations will be established by units that are not satellite capable, as a back-up for satellite terminations in the event of SATCOM equipment failure, for training purposes, and when directed by higher authority.

The NCTAMS operations department has overall responsibility for assigning and monitoring HF terminations within its area of responsibility. HF communications policy and equipment allowances are discussed in NAVTELCOMINST 2800.2 and 2810.1A, respectively. HF equipment configurations, call up, and net control procedures are discussed in NTP 4.

16.1.3.3 Systems. HF will continue to be a viable communications medium well into the future. However, technology advances and changing operational requirements necessitate modernization and streamlining of HF assets throughout the Navy. The following paragraphs delineate HF systems currently in use, as well as planned upgrades.

16.1.3.3.1 HF Transmitters. HF transmitters currently in use ashore range from obsolete vacuum tube technology, (e.g., AN/FRT-83 and 84 series shore transmitters) to the solid state AN/FRT-96 transmitter and

assorted commercial HF systems. The AN/FRT-96 is a modern, digital, high-power HF transmitter (10 kW) capable of remote control operation.

Shipboard HF transmitters include the AN/URT-23(D/E), AN/URT-24, AN/URC-131(V) HFRG, HF-80 HF transceiver, AN/USQ-83 tactical data link system, and the ICS-3 integrated communications system (AN/URC-109).

16.1.3.3.2 HF Receivers. HF receivers currently in use include the R-1051, R-2174, and R-2368. R-2368 receiver will eventually replace all existing HF receivers.

16.1.3.3.3 AN/TRQ-35 Chirpsounder. Unlike LOS communications and SATCOM, HF radio communications require constant management to select operating frequencies that are propagating well and are relatively interference free. The Chirpsounder system aids in determining such frequencies.

The AN/TRQ-35 ionospheric sounder affords communicators the ability to identify, in real time, optimum frequencies from among those assigned for use over a given circuit path. The AN/TRQ-35 transmitter emits a CW signal that sweeps upward in frequency at a constant linear rate between 2 and 16 MHz or between 2 and 30 MHz in 4 minutes and 40 seconds. The transmitters operate with a power of 10 to 100 W for transmission by a broadband antenna.

The Army, Navy, Air Force, and DISA have installed the AN/TRQ-35(V) TFMS to help maintain reliable HF communications. Widespread use of the TFMS requires close coordination to avoid redundancy and mutual interference from installed systems. Unified commanders promulgate policies for sounder operations for their respective areas of responsibility. The USMCEB Joint Frequency Panel promulgates Chirpsounder clock and start times for worldwide operations.

The newer AN/TRQ-42 adds the ability to provide automatic ranking of assigned frequencies based upon propagation quality and channel occupancy.

16.1.3.3.4 Modulator-Demodulators. The following modems currently support HF communications.

a. Full-Duplex Modem. The MD-1061(V) is designed to provide digital data transmission at rates of 75 to 2400 bps. It is specifically designed to provide efficient data transmission in the presence of severe multipath fading and impulse noise typical of HF ionospheric propagation. The MD-1061(V) is compatible with the HF data modem military standard MIL-STD-188C at data rates of 1200 and 2400 bps. At 2400 bps, the MD-1061(V) is suited for use in general purpose digital applications where modest bit error rates can be accepted. Three system features — dual-channel diversity, variable in-band diversity, and forward error detection/correction coding combined with time interleaving — improve transmission reliability.

b. Time-Division Modem. The MD-1142 provides reliable 75 bps teletype throughput in severely degraded HF propagation conditions. TDMs are located at various shore sites throughout the NAVCOMTELCOM claimancy.

c. Low-Speed, Time-Division Multiplexer. The AN/FCC-100(V) LSTDM is a microprocessor-based time-division multiplexer with built in test equipment for continuous diagnostics and fault isolation. It operates at speeds from 1.2 kbps up to 2.048 Mbps and is capable of handling any mix of synchronous, asynchronous, and isochronous data transmissions. It is also operable with CVSD transmission and PCM.

d. High-Speed HF Modem. The RF-5254 is a high-performance multimode modem capable of transmitting data at rates up to 4800 bps in a standard 3 kHz HF/SSB radio channel. It provides reliable operation over HF channels troubled by severe fading and multipath.

16.1.3.3.5 HF Upgrades. Work is progressing along several fronts to increase the efficiency, reliability, and throughput of HF communications through the application of ALE, HSFB, and packetized HF (SURENET) functionalities.

a. ALE. ALE is a method of automatically initiating contact between calling and called stations. The transmitting and receiving station are each assigned a set of 10 blocked frequencies. The ALE modem scans frequencies in 1.2 seconds and selects the best propagated, stabilized frequency for message/voice transmission. It then automatically links the transmitting and receiving stations for simplex or duplex operations.

b. HSFB. The AN/USQ-122( ) HFSB system provides upgrades to the transmission subsystem of the fleet broadcast system. The upgraded system, which consists of HF and satellite segments, increases flexibility, information throughput, and provides additional jam-protected satellite capacity. Fleet commanders and fleet broadcast system managers are provided enhanced capabilities for management of message traffic flow and transmission resources. The HSFB changes the multiplexing scheme, allowing greater channel capacity, increased flexibility, and shared access to an improved

transmission resource for FBS and other tactical shore-to-ship simplex users. The various upgrades implemented by the HSFB conform to VME standards and are integrated into a common VME chassis, except for the MD-900/SSR-1, which is a stand-alone, non-VME unit.

c. SURENET. SURENET is a multimedia capable modem controller utilizing digital packet transmission technology. The system provides a wide range of capabilities including ALE, ALM, LPI, AJ, and guaranteed delivery. However, relatively low throughput rate during HF operations limits its application in its present form.

16.1.4 Very High-Frequency and Ultra High-Frequency LOS Communications. VHF and UHF LOS communications support ship-to-ship, ship-to-shore, and ship-to-air LOS communications. Shipboard tactical VHF radios use the 30 to 88 MHz and 108 to 156 MHz segments of the VHF radio band for ship-to-shore communications in amphibious operations and for land-mobile shore communications. A portion of the VHF band (225 to 300 MHz) and the lower end of the UHF band (300 to 400 MHz) provides tactical ship-to-ship, ship-to-shore, and ship-to-aircraft radio nets. Havequick II and Link 4A also share the UHF spectrum.

16.1.4.1 Characteristics, Advantages, and Limitations. VHF and UHF LOS band signals are ideally suited for short-range shipboard, aircraft, and ashore LOS communications. Signals in these ranges are not affected by ionospheric reflection, so they travel in a straight line. They also allow for a much wider bandwidth than HF (up to 1,000 times), permitting use of spread-spectrum techniques. VHF and UHF signals also have a shorter wavelength, which results in the use of smaller antennas.

Although there is no ionospheric reflection in these bands, there is multipath interference caused by reflection over water. When communicating by VHF and UHF, signals from aircraft reach a ship both directly and by reflection off the surface of the water. This phenomenon creates signals at the shipboard antenna that are out of phase, causing a reduction in signal strength. Multipath can be easily overcome through the use of frequency or space diversity.

16.1.4.2 Systems. VHF and UHF LOS communication systems use a variety of equipment. Only some equipment are transmitters and receivers. The majority fit into a category called transceivers — a combination transmitter and receiver that is generally compact, portable, and uses a single antenna. The following is a compilation of commonly used VHF and UHF LOS equipment and systems and their uses.

16.1.4.2.1 AN/ARC-182 VHF/UHF Radio. A multiband/multimode radio (30 to 400 MHz) used for close air support, air traffic control, maritime radiotelephone, and NATO communications.

16.1.4.2.2 AN/GRT-21(V)3 VHF/UHF Transmitter and AN/GRR-23(V)6 VHF/UHF Receiver. Used for transmitting and monitoring aircraft distress communications (116.0 to 151.975 MHz) in the VHF range and for air traffic control (225.0 to 399.97 MHz) in the high VHF and low UHF range.

16.1.4.2.3 AN/URC-93 VHF/UHF LOS Radio. The several configurations available (225 to 400 MHz) are for use with voice, ECCM, LPI, data, and wideband communications.

16.1.4.2.4 AN/VRC-40 Series VHF Radio. Used aboard ship as well as in vehicles (30 to 76 MHz) to support short-range, two-way VHF communications.

16.1.4.2.5 AN/WSC-3(V)6 UHF LOS Radio. The standard Navy shipboard LOS UHF transceiver (225 to 400 MHz) used for voice, data, and TTY.

16.1.2.4.6 Havequick. A modification of several existing tactical UHF radios for use in providing ECCM capability in the 225 to 400 MHz frequency range.

16.1.4.2.7 JTIDS. A high-capacity TDMA system that provides integrated communications, navigation, and IFF capabilities. It provides ECCM capabilities for aircraft and surface ships, extended range of communications, and over-the-horizon communications for surface ships with an airborne relay platform. It is also designed to accommodate secure voice and the digital information associated with Links 4A, 11, and 14.

16.1.4.2.8 Link 4A. An aircraft control link used to support E-2C AEW aircraft and fighter aircraft by exchanging status and target data and for aligning the carrier aircraft inertial navigation system.

16.1.4.2.9 AN/TSQ-129(V) Position Location Reporting System. This system supports amphibious operations by providing communications and military grid reference navigation capabilities to support battlefield operations.

16.1.4.2.10 SINCGARS. A frequency-hopping, frequency-modulating, spread-spectrum system (30 to 88 MHz) designed to provide secure voice and data communications in jamming environments.

16.1.5 Ultra High-Frequency SATCOM. The military UHF SATCOM system provides communications via satellites between designated mobile units and shore sites. These links supply worldwide coverage between the latitudes of 70º north and 70º south.

SATCOM systems are installed in ships, submarines, mobile vans, aircraft, and suitcase units and at shore stations. These installations vary in size and complexity, depending upon the resident communication requirements. The integrated system provides connection for message traffic and voice communications to DOD long-haul communication networks. Certain shore stations provide a backup capability to other shore stations if an outage occurs.

UHF satellite management centers, tenant activities at each of the three NCTAMS, perform communications resource management functions necessary to provide continuous round-the-clock essential information and control and monitoring of all assigned UHF SATCOM communications resources in support of the Joint Staff, unified commanders, and other authorized users. SMCs report operationally to CINCUSSPACECOM via COMNAVSPACECOM and are manned by USN/USAF personnel. SMCs execute worldwide communications management functions by managing all UHF SATCOM resources available within their respective footprints (footprint being the Earth coverage area of any given satellite). SMCs are the primary UHF SATCOM focal point where authorized users acquire UHF SATCOM access, seek resolution in access assignments, monitor system performance, and report satellite interference. The SMC at Norfolk manages CONUS footprints; the SMC at Wahiawa manages Pacific footprints; and the SMC at Naples manages Atlantic, Mediterranean, and Indian Ocean footprints.

16.1.5.1 Characteristics, Advantages, and Limitations. UHF SATCOM uses a wide variety of radio equipment ranging from portable to large-scale Earth terminals that send signals (uplinks) to a satellite maintaining a geosynchronous orbit. The satellite, 24,000 miles above the Earth's surface, takes the signal, amplifies it, and then transponds it back to Earth. UHF SATCOM has a large range of uses, from the fleet broadcast system to secure voice to low- and medium-rate data circuits. Worldwide coverage is achieved by a constellation of 8 to 10 satellites. Each of these satellites has a set number of narrowband (5 kHz) and wideband (25 kHz) channels that are apportioned to the unified commanders by the JCS. The unified commanders control their assigned assets and validate access requirements.

UHF SATCOM has the following advantages:

1. Reliable communications beyond the LOS. Because UHF signals do not bend, they do not normally follow the curvature of the Earth and are thus limited to a range of about 25 nm. Ducting can extend that range, but only under certain weather conditions. Since it is a straight line from the Earth's surface to a geosynchronous orbit, an UHF signal can travel that distance with relatively low power — about 25 W. As a result, any UHF satellite radio can reach any other UHF satellite radio in the same satellite footprint.

2. LPD/LPI. The uplink beam of an UHF SATCOM radio is usually tightly focused and aimed at the satellite. This makes it less vulnerable to detection than LOS UHF or HF, although geolocation can be accomplished. As a result, C^3 can be conducted over a long distance, with less likelihood that the transmitting station will be located.

3. Variety of uses. UHF SATCOM provides a clean signal that can carry several types of services. It supports the current and planned Fleet Broadcast System, secure and nonsecure voice, and data services such as CUDIXS, TACINTEL, OTCIXS, and others.

4. Commonality.

UHF SATCOM also has some limitations:

1. Finite number of channels. There is a physical limit to how many channels are available for UHF SATCOM because of the requirement for two frequencies for each transponder and the separation required between those frequencies.

2. Low speed of data transfer. The first UHF satellites only carried voice and teletype services. This and the electronic size of a channel place limitations on the speed at which data can be transferred on UHF. Currently this limit is 38.4 kbps. There are many new C^2 systems that cannot be supported by these low speeds.

3. No antijam capabilities.

16.1.5.2 Systems. The military UHF SATCOM system consists of information exchange subsystems that use the satellites as relays for communications, control, and quality monitoring subsystems that provide data to manage satellite resources. Each subsystem structure addresses specific naval communications requirements. These subsystems are described below:

1. Fleet satellite broadcast subsystems are an expansion of the fleet broadcast, which historically has been the central communications medium for operating naval units.

2. CUDIXS and NAVMACS are two installations — CUDIXS ashore and NAVMACS afloat — that combine to form a communications network for transmitting and receiving GENSER message traffic between ships and shore installations.

3. SSIXS complements other communication links between SSBNs, SSNs, and shore terminals.

4. Secure voice subsystem is a narrowband UHF subsystem that links voice communications between ships and connects them to wide-area voice networks ashore.

5. TACINTEL subsystem is specifically designed for special intelligence communications.

6. TADIXS and OTCIXS subsystems provide separate communication links for OTH-T information from shore stations to fleet users in support of Navy cruise missile operations.

7. DAMA system was developed to multiplex several subsystems, or users, on a single satellite channel. This has the effect of allowing more satellite circuits to share an UHF satellite channel.

8. Control subsystem consists of a communications network that facilitates status reporting and management of system assets.

9. Satellite monitoring subsystem provides users of UHF SATCOM with means to analyze and resolve system and equipment related problems. The current subsystem is the SSA.

10. TADIXS B TRE subsystem receives, demodulates, decodes, decrypts, processes, and distributes TADIXS B broadcast contact reports.

11. TRAP subsystem provides near-real-time contact report data to various AN/USQ-101(V) TRE users.

12. TESS(3)/NITES computer-based system is designed to provide Navy tactical commanders aboard major combatant ships and selected shore commands with secure and responsive environmental data support. TESS(3) integrates meteorological and oceanographic data obtained from environmental satellites, data transmitted from shore facilities, on-site environmental sensor data, and manual input data with sensor/weapon system data, platform parameters, and other intelligence, to provide on-site commanders an accurate and near-real-time assessment of the effects of the environment upon specific platforms, weapons, and sensors. The NITES terminal transmits the data to battle group units and major shore bases with meteorological centers.

The installation of subsystem baseband equipment and RF terminals aboard ships and aircraft is driven by communication traffic levels, types of communication, and operational missions. For example, OTCIXS RF links carry teletypewriter traffic and data-link communications for tactical operations. The fleet broadcast, which is a common denominator in naval communications, is received by many different types of ship. A typical suite on a large ship may include fleet broadcast, CUDIXS/NAVMACS, secure voice, TADIXS/OTCIXS, and TACINTEL equipment.

The SATCOM system consists of these subsystems and three satellite constellations: FLTSATCOM, UHF follow-on, and GAPFILLER.

16.1.5.2.1 FLTSATCOM and UHF Follow-on Subsystems. FSC and UFO are the two primary UHF SATCOM constellations. FSC satellites were placed into orbit during the 1970s to provide long-range communications for commanders ashore and major flagships. There were a total of eight FSC units placed in orbit. The first channel of each FSC has a SHF uplink and UHF downlink for the fleet broadcast. As each FSC reaches the end of its service life it is replaced by a UFO satellite. The first four UFOs are essentially identical to the FSC, although UFO 1 is presently dead in orbit. UFOs 4 to 10 will each have a EHF capability on board and will be called UFO/E. Specific information on capabilities of FSC and UFO can be found in appropriate CIB maintained by communications personnel.

16.1.5.2.2 GAPFILLER. Demand for satellite channels and geographic coverage quickly outstripped the Navy's ability to provide the FSC coverage to meet these needs. In a step to counter the growing demand, two less capable and less expensive systems were fielded. GAPFILLER was launched to cover a geographic coverage gap, hence its name. This system has served well and longer than expected and will be retired when all nine UFO spacecraft are in orbit.

16.1.5.2.3 Other DOD Systems. The USAF operates some space-based resources as well as some transponders on FSC satellites, specifically channels 11 to 22. Most of these resources are assigned to long-term

use but are available for limited Navy use in accordance with JCS MOP 37.

16.1.5.2.4 Allied Systems. The majority of UHF SATCOM space-based resources are operated by the United States. One notable exception is NATO IV, a NATO organic UHF satellite system capable of supporting selected NATO UHF and SHF satellite requirements. Allied nations have been provided with some ground equipment through the Foreign Military Sales program. The equipment provided ranges from single channel radios to dual DAMA capability. The primary nations that can access UHF SATCOM are the United Kingdom, Canada, Australia, Japan, and France. This changes often, so communication planners must obtain specific information from the particular nation. Normally, Allied nations will only be granted access when they are part of a combined operation. Appendix E provides specific priorities.

16.1.5.3 Policy on Access. Access to UHF SATCOM resources is governed by JCS MOP 37. Each specific application of an UHF SATCOM channel is assigned a ICDB number that indicates it as a valid use. Requests for access must include this ICDB. All ICDBs are reviewed every 2 years by the Fleet CINC and unified commanders for revalidation. If a new application is desired, a request for ICDB assignment is submitted through the Fleet CINC and a temporary ICDB can be assigned pending JCS approval.

16.1.5.3.1 Systems Priority Structure. A valid ICDB alone will not provide access to a satellite channel. At any given time there are more valid ICDB requests than there are channels. In order to ensure the greatest need is met, MOP 37 has established a priority structure that is used by the Fleet CINC, unified commander, and satellite control agencies for assigning resources. This priority list is contained in Appendix E.

16.1.5.3.2 Narrowband Channels. There are two definitions of narrowband channels. Each FSC has a total of 22 narrowband channels. However, only 10 are Navy narrowband at 25 kHz each, the remaining 12 are Air Force narrowband at 5 kHz each. This can be confusing when dealing with the other Services. A request, using JCS MOP 37 procedures to an Air Force satellite scheduling agency for a narrowband channel will result in a 5 kHz channel that cannot be used by legacy shipboard equipment. The Navy does have portable equipment that can use the 5 kHz channels but it is not routinely available. A Navy narrowband channel is considered a wideband by the other Services.

16.1.5.3.3 Wideband Channels. Each of the FSC and GAPFILLER satellites has one wideband channel — Channel 23. It is 500 kHz wide and is divided for Navy use into 20 separate 25 kHz channels. Thus a network may be assigned to wideband 23 channel 8 for instance. This division gives Navy users more channels; however, it has some limitations. The power of one 500 kHz transponder is divided among 20 channels, so that the more users on the channel and the higher the data rate of each net, the lower the quality. Additionally, submarine platforms cannot use the wideband channels because they have a smaller, omni-directional antenna.

The confusion over narrowband versus wideband will end as the UFO satellites are placed into service. On these spacecraft, there are only 25 kHz and 5 kHz channels. There is no 500 kHz wideband channel, so all Services will use the Joint definition of narrowband and wideband. Navy planners accustomed to the old distinction will have to specify 25 kHz when requesting access. The next generation of shipboard UHF satellite radios will have a 5 kHz capability.

16.1.5.4 Satellite Operational Control. UHF SATCOM control is divided into two areas. One concerns scheduling of access and the other is the maintenance and tracking (or care and feeding) of the space-based resources.

16.1.5.4.1 Authority and Responsibility. JCS MOP 37 governs scheduling of satellite channels. Satellite channels are allocated by JCS to unified commanders and other organizations, such as WHCA or the individual Service chiefs. Unified commanders then assign channels to component commanders based on ICDB and priority. A few channels are used for R&D and special cases and are managed by COMNAVSPACECOM.

CINCUSSPACECOM is responsible for satellite maintenance and tracking with further delegation to the Services' space commands. These assignments are based on telemetry, tracking, and command terminal locations and which Service paid for the satellites. Consequently, the Navy controls all the FSCs.

16.1.5.4.2 Area Control. Area control refers to the daily management of satellite channels assigned to the Fleet CINC. Each NCTAMS has a JFTOC that is responsible to the Fleet CINC for this daily management. Depending on the guidance provided to the JFTOC, the watch officer may shuffle channel assignments as necessary to keep services available. Once a channel is assigned by the Fleet CINC, the JFTOC is the point of contact for that channel.

16.1.5.5 Communication Methods and Procedures. This paragraph briefly discusses some of the UHF SATCOM services. Specific services and channel assignments are listed by the SMC at each NCTAMS in a weekly message with changes published as part of the daily status message.

16.1.5.5.1 Fleet Broadcast. The fleet support broadcast is currently a 16 channel data stream (15 channels of information and one channel of timing) that runs at 1200 baud aggregate. Generally, the first eight channels carry first-run information, while the other seven carry second-run traffic or are tailored for special purposes. Channel 1 uses a SHF uplink for jam resistance and an UHF downlink. The new HSFB will use a 19.2 kbps data stream to carry much more data.

16.1.5.5.2 DAMA Access. The proliferation of UHF SATCOM increased the demand for access to satellite channels. The limited number of satellite channels combined with the space limitations for satellite radios led to the development of DAMA. DAMA takes each satellite channel and breaks it into individual time slots. This breakup allows a single shipboard UHF satellite radio to access up to four channels of information on each 25 kHz channel. This means that a single radio can carry any combination of voice or data circuits not exceeding a total baud rate of 9600 bps. The combinations and time slots available depend on how the Fleet CINC and JFTOC have set up the channels. Currently, the Navy is the only Service using DAMA; however, the Joint Staff has called for other Services to field a DAMA capability.

16.1.5.5.3 SATCOM Interference. SATCOM interference has several causes. Since UHF is line of sight to the satellite and not usually subject to atmospheric conditions, most interference encountered is man made. Interference can be the result of equipment problems, unauthorized access of satellite channels, or poor circuit discipline. Some interference is beyond military control (e.g., an Atlantic constellation channel has been degraded because of telephone systems in South America).

SATCOM interference should be reported immediately to the area SMC, with an information copy to the Fleet CINC and COMNAVSPACECOM DAHLGREN VA//N3//. If operating in company with other units, determine if the interference is affecting them. The communications control ship should send a consolidated report to the group commander, listing all units affected, i.e., CVBG, ARG.

16.1.6 Super High-Frequency Defense Satellite Communications System. DSCS was deployed by the U.S. Army Signal Corps to provide jam resistant high-data-rate communications for vital strategic command and control and to extend telephone services to field units where cable was not installed. DSCS is a SHF system using geosynchronous satellites. The Navy first started using DSCS to support telephone lines to remote stations and for passing data among IUSS members. The first afloat use of SHF was on the USS Mount Whitney and T-AGOS ships. DSCS was subsequently used by aircraft carriers with a modified Marine Corps SHF van. DSCS is now widely used by all command ships, aircraft carriers, and amphibious flagships.

16.1.6.1 Characteristics, Advantages, and Limitations. Each DSCS spacecraft has four transponders. The transponders are assigned a specific amount of power for use by individual ground terminals. When a command is assigned a SHF termination, it is provided with a center frequency and a power limit. The power limit, combined with the antenna size of the terminal, determines how much bandwidth that unit can access. The bandwidth then determines what kind and how many services can be placed on the termination.

SHF DSCS allows flagships to access many services that cannot otherwise be provided afloat. Ships with SHF are provided with high-data-rate systems (e.g., such as CTAPS, VTC, voice telephone lines, and other services). These have become vital C^4I tools for conducting joint operations at sea. SHF offers ships access to the same services, but at a reduced rate, as the ashore commander.

There are some limitations to Navy use of DSCS. The amount of bandwidth available is a function of the assigned power limit and the antenna size (i.e., with power constant, the larger the antenna the greater the bandwidth). Likewise, a fixed antenna size necessitates an increase in power. This is impractical on ships because it encroaches on other users. In 1995, the Navy began replacing less capable shipboard antennas with 7-foot diameter antennas. The other limitation has been the requirement for the Navy to use a hub and spoke arrangement. Afloat antennas move around, unlike fixed shore antennas. As a result, Navy terminals allow for Doppler shift. Because of this, Navy afloat terminals are not able to connect with Army and Air Force terminals except through a Navy shore terminal that relays the signal through another DSCS path or on a landline. Communications engineers are currently addressing this problem.

16.1.6.2 Systems. DSCS is the only SHF system operated by the U.S. Government. There are about three generations of DSCS spacecraft in orbit, but they are all essentially the same.

16.1.6.2.1 Allied Systems. Allied nations in both Europe and Asia have SHF systems. These systems are not as flexible as the DSCS system because of the method of access assignment. DSCS allows the assignment of bandwidth through a wide range, from 16 kbps to the limit of power. Allied systems have channels divided into 64 kbps blocks. European SHF systems are operated by NATO.

16.1.6.3 Policy on Access. Access to DSCS is strictly governed by JCS MOP 37. A ship with SHF capability generally accesses DSCS while conducting a joint mission. DSCS requests must be made to the unified commander through the CJTF or the Fleet CINC.

16.1.6.4 Authority and Responsibility. The DSCS system was originally an Army program but, because of increased Joint use, it is now under the control of DISA. The unified commander has a specific allocation of resources, but must request additional resources from DISA.

16.1.6.4.1 Area Control. The majority of DSCS resources are assigned on a long-term basis or have specific missions. However, a unified commander may request additional resources for military operations from DISA.

16.1.6.4.2 Terminal Locations. DSCS terminals are strategically located at 14 STEP sites throughout the world. Of these sites, the Navy has equipped nine for ship support and uses the Fort Gordon site for training. Specifically, the Navy uses five primary STEP sites (Landstuhl, GE; Northwest, VA; Wahiawa, HI; Bahrain, BA; and Lago di Patria, IT) to support continuous fleet requirements. The remaining four sites (Fort Buckner, Okinawa, JA; Fort Detrick, MD; Camp Roberts, CA; and Fort Belvoir, VA) serve as secondary/alternate sites for restoral and/or contingency service. Navy STEP sites provide full-duplex ship-to-shore and ship-to-ship communications, supporting data and voice operational and administrative communications requirements. Additional STEP sites include MacDill AFB, FL; Croughton, UK; Riyadh, SA; Fort Bragg, NC; and Fort Meade, MD.

16.1.7 Extremely High-Frequency Communications. The EHF satellite system was developed as a survivable communications system for use in the event of nuclear war. During the 1980s, a good deal of R&D money was expended to bring this system, known as MILSTAR, into service. EHF was started by the Air Force but quickly became a Joint program.

The Navy is rapidly fielding AN/USC-38 MILSTAR system control terminals along with equipment to use them. Although currently in its infancy, EHF is rapidly becoming an important method of communications.

16.1.7.1 Characteristics, Advantages, and Limitations. Unlike UHF and SHF, EHF satellites are not bent pipe systems and have onboard processors. The processor is essentially an orbiting switchboard that allows a great deal of flexibility. Using the combination of privilege and precedence, EHF can be used for network, broadcast, and point-to-point communications. The uplink of EHF is operated in the 43.5 to 45.4 GHz range. The downlink is in the 20.2 to 21.2 GHz range. (The downlink is technically in the SHF spectrum.) EHF does not use channel assignments but a series of time slots, uplink demodulators, and downlink hops to provide access. Additional information can be found in COMNAVSPACECOM's EHF Concept of Operations.

EHF offers some interesting advantages over UHF and SHF. Because EHF was conceived during the nuclear age, it was designed to provide very robust communications. Depending upon the available resources, privilege and precedence of the circuit, and weather conditions, a network or point-to-point call can be strengthened to overcome interference. EHF terminals also have a feature that permits a calling station to add another terminal to a network as long as the terminal is turned on and not otherwise occupied. For example, if a flag officer on a carrier wants to contact a cruiser that is not normally on the network, the flag terminal operator need only add the cruiser's terminal serial number to the network and an alert will appear at the cruiser terminal.

Each MILSTAR satellite also has a cross-link capability that allows it to link to other MILSTAR satellites. This means a ship in one satellite footprint can contact a ship or station in another footprint without the signal passing through an Earth station.

As with other satellite systems, EHF also has limitations. The very feature that provides robust signals currently limits the data rate and number of circuits that a terminal can support. The maximum data rate on any primary port is 2400 baud. The next generation of MILSTAR will have a MDR capability. EHF can also be affected by weather. In a heavy rain storm, a greater number of resources must be used to complete a circuit.

16.1.7.2 Systems. The three EHF Systems currently in use are FEP, MILSTAR, and UFO/E.

16.1.7.2.1 FSC with EHF Package. FEP consists of two satellites, FSC-7 and FSC-8, one over the Atlantic and the other over the Eastern Pacific. These satellites support UHF SATCOM services as their regular mission, but are fitted with EHF to support R&D of terminals and procedures. During the initial deployment of operational terminals, FEP resources were divided between R&D and operational and training use. They do not have cross-link capability.

16.1.7.2.2 MILSTAR. MILSTAR is the primary EHF system. It is a robust system that uses Earth coverage beams, spot beams, and agile beams and has cross-link capability. Eight MILSTAR satellites are expected to be in orbit by 2005. There are currently two deployed with the next launch scheduled for 1999. The next satellite will be a MILSTAR II with MDR.

16.1.7.2.3 UHF Follow-on With EHF. UFO satellites 4 to 10 have a limited number of uplink resources. They will provide some EHF capability until all of the MILSTARs are in orbit. Primarily, they lack a cross-link capability. There are currently four UFO/E spacecraft in orbit. Each UFO/E has a 9600 baud fleet broadcast capability.

16.1.7.2.4 EHF LDR and MDR. The maximum data rate of EHF is 2.4 kbps on any single circuit. The Navy EHF communications controller that is being installed in surface ships, submarines, and shore facilities is capable of higher data rate circuits and splits them into 2.4 kbps segments that allow use of two or more primary AN/USC-38 ports. Although a good stopgap measure, it limits the AN/USC-38 to 9.6 kbps, as the USC-38 has only four primary ports rated at 2.4 kbps each. The need for higher capacity has been recognized and the next generation of MILSTAR and AN/USC-38 terminals will be MDR capable. MDR will provide rates of 4.8 to 2240 kbps depending on the size of antenna.

16.1.7.3 Policy on Access. EHF is the first system deployed since the release of JCS MOP 37. EHF access is strictly governed by this MOP. All requests for resources must be approved by the unified commander after validation by the Fleet CINC or numbered fleet commander.

16.1.8 Commercial Satellite Systems. The growth in requirements for C^2 information afloat and the new systems fielded to provide that information have lead to a saturation of DOD satellite systems. As a result, the Navy has purchased/leased equipment that uses commercial satellites. Use of these satellites ranges from providing simple telephones to high-capacity C^2 systems.

16.1.8.1 Characteristics, Advantages, and Limitations. Commercial satellite systems offer high capacity, are readily available, and are widely used by merchant shipping, telephone, and broadcast companies. Commercial systems can be rapidly installed and access can be made available to easily provide mission support. The main drawback is the high cost of satellite time.

16.1.8.2 Systems. There are two commercial systems commonly in use by the Navy. They are INMARSAT and commercial wideband SATCOM.

16.1.8.2.1 INMARSAT. The International Maritime Satellite Organization is a partnership of member countries, currently numbering about 75, who cooperate to provide global communications to and from ships (as well as to and from portable/transportable facilities, land-based vehicles, and aircraft) traveling anywhere within four ocean regions (i.e., Atlantic Ocean Region-East, Atlantic Ocean Region-West, Indian Ocean Region, and Pacific Ocean Region). The INMARSAT communications structure is composed of three major components: the space segment, the ground segment, and the ship-Earth stations or land-mobile Earth stations that may be installed aboard Navy ships or carried with mobile ground forces. Additional information is contained in NTP-10.

16.1.8.2.1.1 Policies Governing U.S. Navy Use of INMARSAT. COMNAVCOMTELCOM is responsible for establishing and promulgating procedures for Navy and USNS communications via INMARSAT in accordance with policy established by CNO. INMARSAT operations may be conducted by Navy units during operations and transits and while in port under normal peacetime conditions unless:

1. The operational chain of command imposes objection.

2. EMCON is imposed. When EMCON restrictions are in effect in the "L" band, full-duplex INMARSAT operations must be shut down because the terminals automatically acknowledge incoming calls.

3. Host government regulations pertaining to communications in foreign ports do not permit unrestricted operations. Include INMARSAT transmit frequency in LOGREQ messages submitted for all foreign port visits where INMARSAT use in foreign territorial waters is proposed.

4. During sensitive or classified movements, unencrypted commercial communications from USN ships are prohibited unless specifically authorized by the OTC. Merchant ships under charter to COMSC that do not have COMSEC capability will not transmit classified information.

Based on INMARSAT regulations, ships engaged in armed conflict shall only use INMARSAT terminals for distress and safety communications or other purpose recognized by international humanitarian law. USN/USNS ships shall comply with this specific restriction.

16.1.8.2.1.2 Funding For INMARSAT Installations. Fleet commander and CNO approval are required prior to installation of INMARSAT or other commercial satellite communication services. Type commanders will maintain records of all installations. Requests for duplex INMARSAT installations should be submitted via type and fleet commanders to OPNAV (N6). OPNAV will submit licensing applications for approved duplex INMARSAT to INMARSAT Headquarters via COMSAT and IRAC. COMSC approves terminal installations on USNS and merchant ships under COMSC charter. COMSAT Corporation will forward the master INMARSAT service invoice to DITCO for centralized payment. DITCO will, in turn, debit individual user accounts. COMNAVCOMTELCOM will administer certification and adjustments of Navy accounts.

16.1.8.2.1.3 Types of INMARSAT Installations. There are several different types of INMARSAT installation.

1. INMARSAT-A is the original system, in use since 1982. It is based on analog techniques and capable of global two-way telephone, facsimile, data, and TELEX service. The size of its ship-to-Earth terminal limits the types of ship capable of carrying it.

2. INMARSAT-B system is based on digital techniques and offers increased capacity for commercial and secure telephone, data, and video teleconferencing for less cost.

3. INMARSAT-C is a digital system based on low-cost, low-power consumption ship-to-Earth stations. It provides global two-way, store-and-forward messaging, distress alerting, and other services. It is not capable of providing voice services. Its small sized ship-to-Earth station makes installation on all types of ship possible.

4. INMARSAT-M system is based on digital techniques and offers 2.4 kbps capacity for very small ships. It provides voice and data satellite connectivity to units having little or no satellite capability.

16.1.8.2.2 Commercial Wideband Satellite Communications. Commercial wideband SATCOM (formerly Challenge Athena) is designed to demonstrate that primary imagery can be delivered afloat in near real time using currently available off-the-shelf technology, including commercial satellite connectivity.

Since the volume of imagery delivered afloat is relatively small, recent commercial wideband SATCOM demonstrations have explored a multi-use concept. Through the incorporation of smart-mux equipment, services such as commercial telephone and video teleconferencing can be added, deleted, increased, or decreased within seconds, as the situation dictates. There are some difficulties with commercial wideband SATCOM installations that must be resolved. These include suppressing interference caused by shipboard radars.

Commercial wideband SATCOM allows for the use of higher data rate commercial satellites such as INTELSAT as an alternative to INMARSAT or military satellites for ship-shore-ship communications. It provides the following features:

1. User controlled, dynamically multiplexed service for VTC, National Imagery Service, Medical/PAO Imagery Transmission, JDISS, ship-to-shore tactical imagery transmission, ISDN, sailor phones, and various other circuits

2. Data rates up to T-1 (1.544 Mbps) at a competitive rate

3. User determination of circuit configuration in accordance with the C^4IFTW concept

4. Rapid receipt of up-to-date, high volume national imagery by afloat commanders for targeted/concerned areas.

5. An alternative to the existing military nets.

16.1.8.3 Policy on Access. Type commanders may authorize the installation of INMARSAT terminals. Individual ships are responsible for the air time costs. Commercial wideband SATCOM access is provided to flagships through a centrally funded program based on operational needs validated by the fleet commander. Figure 16-5 is a block diagram of commercial wideband SATCOM.

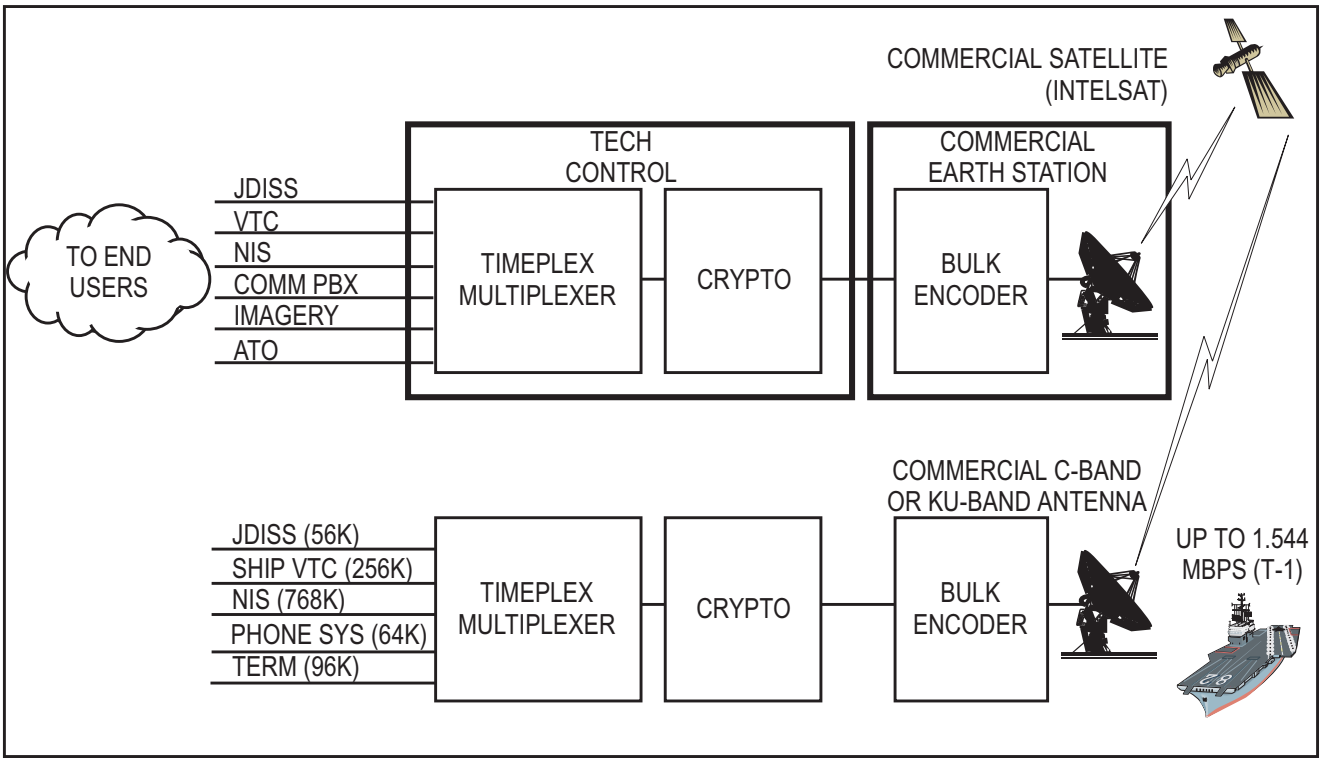

Figure 16-5. Commercial Wideband SATCOM

16.2 THE JOINT MARITIME COMMUNICATION STRATEGY

The changing nature of the military threats facing the United States have been followed by advances in technology, particularly in the area of communications, that fueled evolutionary and revolutionary changes. This technological growth will continue and even accelerate in the future.

JMCOMS allows a broad evaluation of the products the Navy needs to satisfy evolving mission requirements. The Navy is working to leverage technologies that allow multifunction processing of intensive capabilities to be hosted in single modular and flexible products. The current approach is threefold:

1. Standardize on industry accepted standards for management, routing, and switching systems using commercial products to upgrade existing systems.

2. Integrate communications capabilities in the < 2 GHz frequencies into a modular software, programmable DMR ("Slice radio") and begin to develop multifunction capabilities.

3. Integrate various aspects of the > 2 GHz radios, pursue low observable antenna technologies for the next classes of combatants, and reevaluate the need for every communications pipe based on the advantage that networking brings, the shipboard impact of integration of current antennas topside, and the platform's information transfer needs.

Significant enhancements in fleet communications will be achieved through the deployment of high bandwidth pipes and implementation of network and communication resource management functions to efficiently control them. JMCOMS will exploit commercial technology products and services whenever possible and will continue to push the envelope to provide the naval warfighter with seamless communications capacity.

16.2.1 JMCOMS Technical Strategy. The JMCOMS technical strategy consists of three elements: ADNS, DMR ("Slice radio"), and ITP. Figure 16-6 depicts the conceptual JMCOMS architecture.

16.2.1.1 Automated Digital Network System. The ADNS, the key to JMCOMS, will provide efficient networking and automation capabilities and will ensure worldwide communications connectivity via the

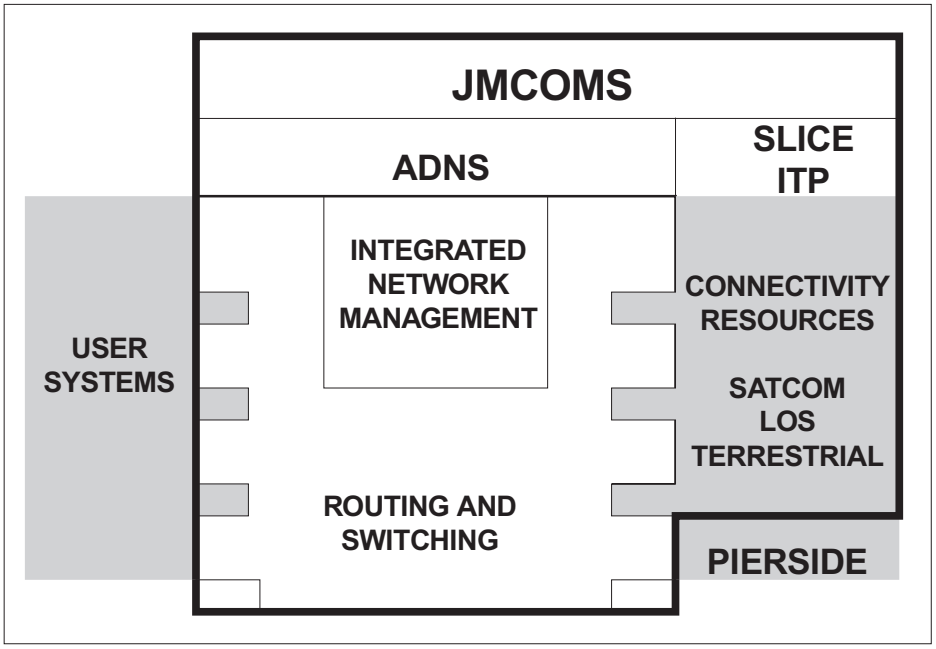

Figure 16-6. Conceptual JMCOMS Architecture

RF communication assets included in DMR and ITP. ADNS will leverage industry accepted standards for communications routing, switching, and management and will employ COTS/GOTS hardware and software to provide timely, efficient, and seamless data delivery to and from all data user sources — Navy, Joint, and Allied. ADNS networking capabilities will allow for the sharing of scarce communications bandwidth and will reduce reliance on stovepipe communication systems and dedicated bandwidth allocations. ADNS will effectively pool communication resources and remedy the problems caused by overloading or underuse of communication circuits. Demonstrations and exercises (e.g., JWID 95 and RIMPAC 96) have shown that such networking capabilities can increase use of communication circuits by factors of 4 to 10. The bandwidth management and technical control automation capabilities of ADNS will provide significant payoff to the Navy in terms of savings in money and manpower. Adaptation and adherence to industry standard protocols will potentially afford access to any networked IP application, opening up a multitude of new opportunities including battle group E-mail, World Wide Web, and FTP. The integration of commercial standards and COTS/GOTS hardware will significantly reduce ADNS development, procurement, and maintenance costs. Overall, ADNS maximizes information transfer efficiency and provides seamless afloat/ashore voice, video, and data networks for worldwide, interoperable communications. Figure 16-7 illustrates the ADNS target architecture.

16.2.1.2 Digital Modular Radio System. DMR will satisfy tactical communication requirements in the HF, VHF, and UHF ranges. DMR will reduce the cost of acquiring and upgrading communication systems and will increase tactical flexibility. The DMR system will migrate from stand-alone, stovepipe terminal systems to a modular radio comprised of flexible, software configurable, hardware modules. The DMR controller will be able to command any set of these common hardware modules to perform the function of any of the separate radios that now operate in these frequency ranges. Employing common hardware modules, standards, and software will reduce the need for multiple procurements of unique terminal systems, each with their own lifecycle support. This emphasis on an open hardware and software architecture will reduce the cost of acquiring, fielding, maintaining, and supporting this system. DMR will permit the tactical commander to reconfigure RF assets in accordance with changing mission needs. Each hardware module in the DMR system will be configurable and can tune and perform related functions within multiple frequency spectrums. DMR will be compatible with ADNS for network control and monitoring capabilities. In addition, the DMR system will field integrated, multiband antennas, such as MERS, that will reduce topside space and weight and will lessen ship radar cross section. In short,

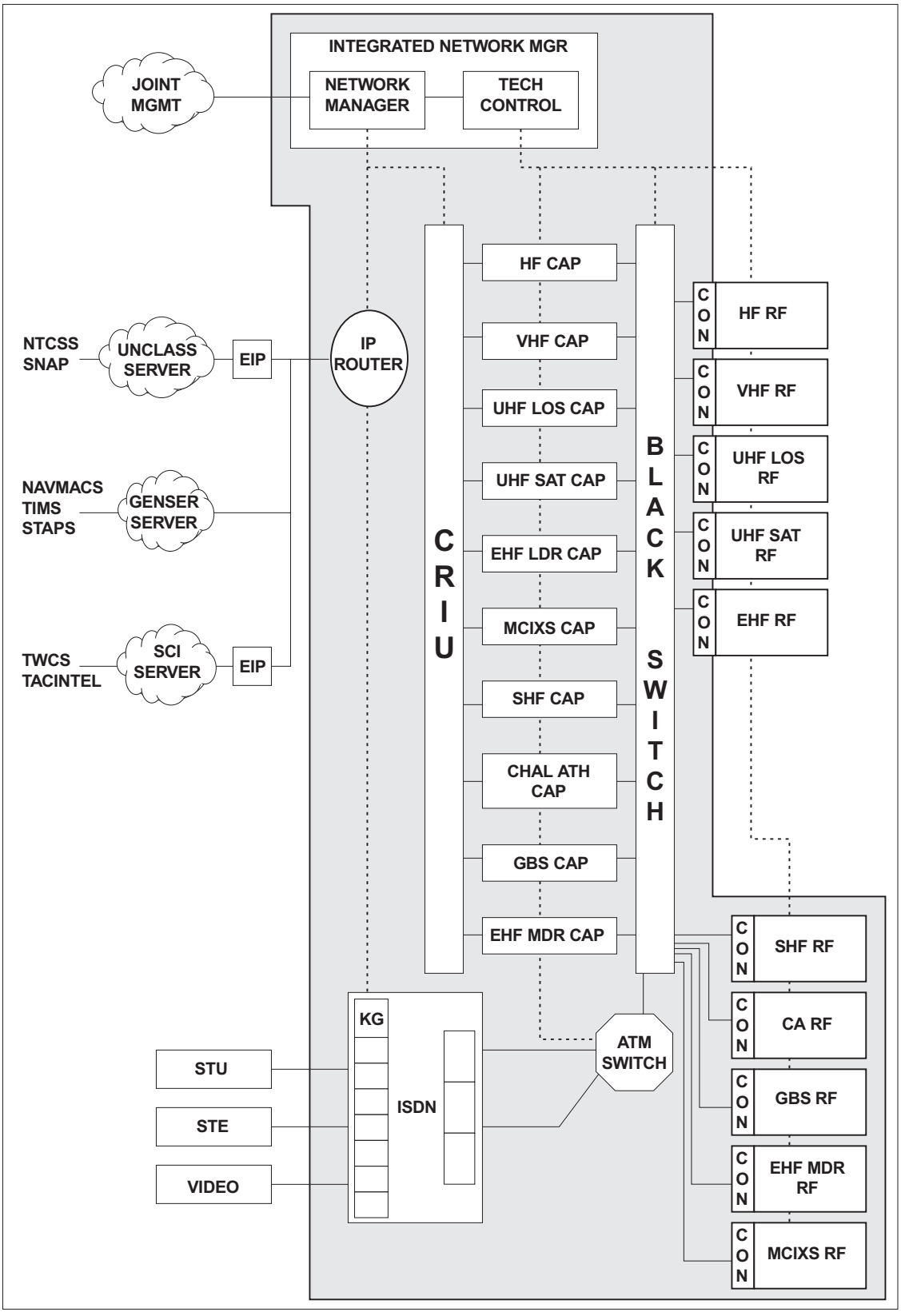

Figure 16-7. ADNS Target Achitecture

DMR will provide affordable, flexible, interoperable, demand adaptive communications.

16.2.1.3 Integrated Terminal Program. ITP will provide flexible and responsive subsystems and terminal equipment that will enable protected narrowband and wideband communications connectivity. ITP will satisfy communication requirements in the SHF, EHF, and commercial SATCOM frequency bands. This program will field a collection of military and commercial products that will evolve to further the JMCOMS objectives of providing increased communications connectivity and joint interoperability. ITP will leverage commercial terminal systems and services, such as C and Ku wideband SATCOM, direct broadcast satellite service, INMARSAT, and global broadcast service to support high data-rate requirements (e.g., intelligence, weather, live video, news, and imagery). ITP will place emphasis on COTS/GOTS components and will pursue plug and play modular terminal configurations. As with ADNS and DMR, the use of an open systems architecture and the leveraging of commercial services and technology will reduce cost and permit rapid terminal upgrades and technology insertion. ITP will ensure compatibility with ADNS for management of RF resources. ITP will also develop and implement multifunctional antennas into a single lightweight structure and reduce ship radar cross section and infrared signature. In summary, ITP capabilities, integrated with ADNS and DMR, will provide adaptable, joint interoperable, protected, and high-capacity communications at less cost.

16.2.2 JMCOMS Enabling Programs. Each JMCOMS element is supported by a variety of enabling programs that provide both legacy system capabilities and the opportunity to implement the JMCOMS architecture. The following paragraphs provide a brief summary of each enabling program.

16.2.2.1 ADNS Enabling Programs. ADNS enabling programs are described below.

16.2.2.1.1 ANCC, ATC, and ADMS. These programs automate technical control functions ashore and afloat. Technical control automation supports the planned ADNS transition to ATM. Matrix switches will be phased out. Routers, multiplexers, CAP equipment, and other network devices will remain for bandwidth management.

16.2.2.1.2 Battle Group SATCOM. OTCIXS and the TADIXS A provide mission targeting data to Tomahawk shooters and allow secure UHF SATCOM data transfer capability for ship-shore, shore-ship, and ship-ship connectivity. ON-143(V)6 hardware is being replaced to provide multiple interfaces to JMCOMS and to enhance data throughput.

16.2.2.1.3 Battle Force E-Mail. This program provides E-mail capability to selected BG/ARG ships. The system is fielded on an ad hoc basis by BG/ARG/JTG and other units. Battle force E-mail will provide the ADNS HF CAP.

16.2.2.1.4 Joint MILSATCOM Network Integrated Control System. JMINI is a joint 5 kHz and 25 kHz automated DAMA controller that will evolve to be part of the ADNS INM control capability.

16.2.2.1.5 Joint Maritime Tactical Switching System. The JMTSS provides tactical network switch access between the afloat CJTF, the BG/ARG/JTG, and the joint/combined forces. JMTSS provides ISDN switching capabilities for ADNS and provides an automatic tactical voice and video network at sea.

16.2.2.1.6 Navy EHF Communications Controller. NECC provides a multi-access network permitting JOTS, IP, tactical data processor, and mission display system users to share EHF subnet capacity on a priority demand basis. NECC will evolve to be part of ADNS INM control capability.

16.2.2.1.7 Ship Automated Communications Control System (AN/SSQ-33). The SACCS plans, implements, monitors, and controls existing radio communication networks, circuits, and virtual networks by performing computer-controlled resource management and technical control automation. SACCS will transition to JMCOMS and will serve as host engine/processor for ADNS.

16.2.2.1.8 Shipboard Communication Switching System (Red/Black Switch). SCSS automates shipboard analog and digital red and black switching by replacing antiquated manual patch panels. SCSS provides automatic switching between modems, encryption devices, and radio transmitters and receivers. SCSS will transition to JMCOMS as part of ADNS.

16.2.2.1.9 Shore Remote Control System. SRCS provides remote control and monitoring of multiple equipment, such as transmitters, receivers, data switches, RF switches, multiplexers — improving efficiency, reducing manning requirements, and enabling consolidation and/or colocation of DOD support missions and facilities. SRCS capabilities will transition to JMCOMS as part of ADNS.

16.2.2.1.10 Shared Signaling Access. The UHF SSA is a stationary, computer-based, digital spectrum analyzer capable of monitoring UHF SATCOM signals, to include DAMA and IXS transmissions, and of performing analysis of RF interference. SSA will provide RF link monitoring capabilities to JMCOMS.

16.2.2.1.11 TACINTEL II+/SI COMMS. The TACINTEL II+ system provides ship-to-ship, real-time exchange of tactical SCI communications to afloat operational commanders. TACINTEL II+ is the SI pillar of the Copernican TADIXS architecture and will provide connectivity to all vertical echelons of SIGINT sources at the national, theater, and battle force levels. TACINTEL II+ will transition to ADNS and its functionality will be critical to the ADNS INM effort.

16.2.2.1.12 Video Information Exchange System. VIXS provides secure video teleconferencing capability to CNO, fleet CINCs, selected shore sites, and afloat platforms with DSCS/commercial wideband SATCOM bandwidth. VIXS is currently ISDN/ATM compliant. VIXS will transition to JMCOMS as a part of ADNS.

16.2.2.2 DMR (Slice Radio) Enabling Programs. Slice radio enabling programs are described below.

16.2.2.2.1 AN/URR-79(V) (R-2368B). AN/URR-79(V) is a high-performance, multimode, remotely controllable, LF/MF/HF capable receive subsystem. The functionality of the AN/URR-79(V) will be incorporated into Slice radio.

16.2.2.2.2 Submarine LF/VLF VME Receiver. SLVR is the next generation LF/VLF receiver for use in 688 and SEAWOLF class SSNs and TRIDENT SSBNs. SLVR will be capable of receiving and processing all required Navy, special, and NATO modes and will be easily adaptable to meet future requirements. SLVR is based on the commercial VME and VXI open system architectures.

16.2.2.2.3 HF ALE. HF ALE provides a modem/controller for automated selection of the best available propagating frequency for HF radio links. HF ALE reduces shipboard operator requirements and improves HF link availability. The functionality of this modem/controller will be integrated into Slice radio.

16.2.2.2.4 HFRG. HFRG is a HF transmitting/receiving system that provides for the transmission and reception of user information in lower sideband, independent sideband, upper sideband, FSK, CW, AM, and Link 11. HFRG provides for tactical long-haul operations on full- and half-duplex ship, shore, and submarine platforms. HFRG will be a critical part of JMCOMS Phase I, as it provides RF infrastructure for the programmable CMR/T unit.

16.2.2.2.5 HF (Small). HF (Small) provides automatic, software controllable radios for those ships not equipped with HFRG. HF (Small) capabilities will be integrated into Slice radio as part of JMCOMS Phase II.

16.2.2.2.6 HF Tilt. HF antenna tilting groups provide the means to raise and lower HF whip antennas during flight operations or as necessary to avoid interference with aircraft and combat system operators. HF tilt will transition to JMCOMS as part of Slice radio.

16.2.2.2.7 HSFB. The HSFB system is a multifunctional system designed to provide more efficient RF bandwidth use and increased data throughput on the fleet broadcast system. It will also significantly improve HF tactical communications between and among BG/ARG/JTGs and will interface with Joint, Allied, and NATO systems.

16.2.2.2.8 AN/GRC-211 VHF Radio. AN/GRC-211 provides air warfare ships with the ability to rapidly tune to numerous aircraft emergency frequencies. The radio helps prevent accidental shootdown incidents by improving ship-to-air and air-to-ship communications. AN/GRC-211 functionality will be included in Slice radio CMR/T and VHF RF distribution.

16.2.2.2.9 AN/URC-80 Replacement. The AN/URC-80 replacement program purchases and installs radios to provide bridge-to-bridge VHF SOLAS communications in accordance with CG-169. AN/URC-80 replaces legacy equipment with COTS/GOTS radios of modern digital design. AN/URC-80 functionality will be incorporated into Slice radio.

16.2.2.2.10 SINCGARS. SINCGARS provides VHF-FM, antijam, and two-channel airborne relay for over-the-horizon communications for naval surface fire support and amphibious operations. SINCGARS functionality will be included in Slice radio.

16.2.2.2.11 Havequick. Havequick ECCM configuration for UHF transceivers provides a frequency hopping capability in the 225 to 400 MHz range for jam-resistant communications. Havequick functionality will transition to JMCOMS as part of Slice radio.

16.2.2.2.12 UHF SATCOM/LOS. Legacy UHF SATCOM systems include the AN/WSC-3(V), AN/WSC-5(V), AN/USC-54(V), TD-127IB/U, OK-454/455, OK-326, AN/SSR-1/1A, and OE-820/WSC-l(V).

These systems have provided reliable UHF communications connectivity to the fleet for years and will be maintained until modern systems/capabilities are fielded as part of Slice radio. UHF legacy and DAMA systems will play an important role in the early phases of Slice radio.

16.2.2.2.13 Mini-DAMA. The mini-DAMA system integrates the DAMA capabilities of the TD-1271 B/U and the R/T capabilities of the AN/WSC-3 (V) into a single system, allowing installation on platforms with space and weight considerations (i.e., submarines and aircraft). Mini-DAMA is COTS-based and modular and contains a Red and Black Ethernet interface to connect to the ADNS system. Mini-DAMA will transition to JMCOMS as part of Slice radio.

16.2.2.2.14 Digital Wideband Transmission System. DWTS is a USMC program that provides two UHF, secure, full-duplex, digital wideband transmission links ship-to-ship or ship-to-shore. These links are high-data-rate capable and interoperable with U.S. forces ashore. The DWTS capability is to be included in the ADNS open architecture and will serve as a baseline program for Slice radio.

16.2.2.2.15 Joint Tactical Terminal-Navy. JTT-N will be a single multiconfigured terminal based on OSA and will incorporate tactical receive equipment, commanders tactical terminal, and multimission advanced tactical terminal capabilities. These capabilities include receiving tactical intelligence via UHF communication links for TADIXS B, TRAP data dissemination system, tactical intelligence broadcast system, tactical reconnaissance information exchange system, and transmitting tactical intelligence via UHF for the tactical intelligence broadcast and tactical reconnaissance information exchange systems.

16.2.2.2.16 Maritime Cellular Information Exchange Service. MCIXS provides inter and intra BG/ARG/JTG telecommunications by way of cellular telephone trunking. The user may employ either a standard desktop or cellular telephone to access the trunk. MCIXS will transition to JMCOMS and the cellular capability will be incorporated into Slice radio.

16.2.2.2.17 Multifunction Electromagnetic Radiating System. MERS merges multiple RF systems, such as UHF communications, JTIDS, combat DF, and IFF, into a single, low-cost antenna structure. MERS reduces RCS weight and size and provides for topside design arrangement flexibility. MERS will be critical to meeting the JMCOMS Phase 3 requirement for an improved RF distribution system.

16.2.2.2.18 RD-390 Replacement. RD-390 replacement purchases/installs a replacement for the RD-379, RD-379A, and RD-390 audio logging systems. It provides for the recording of communications traffic in order to satisfy requirements for the archival storage of SOLAS radio traffic. RD-390 replacement will transition to JMCOMS as part of Slice radio.

16.2.2.3 ITP Enabling Programs. ITP enabling programs are described below.

16.2.2.3.1 AN/WSC-6(V)X. AN/WSC-6(V)X will be an X-band, single channel, NDI, ADNS-compatible system for non-flag capable surface ships. This terminal system will offer high capacity voice, data, and video transfer with data rates from 64 kbps to 1 Mbps.

16.2.2.3.2 AN/WSC-6(V)2/4 Mod. This modification of all flag-capable ship X-band (DSCS) terminals will provide NDI, state-of-the-art RF components, larger aperture antennas for higher data rates, and simultaneous dual channel operation.

16.2.2.3.3 AN/WSC-6(V)4. The current production SHF SATCOM terminal, AN/WSC-6(V)4, provides all flag-capable ships X-band (DSCS) joint connectivity and high capacity voice, data, and video transfer capabilities. AN/WSC-6(V)4 provides single channel capability and data rates up to 2.2 bps.

16.2.2.3.4 Commercial Wideband SATCOM Program. These COTS-based terminals operate in the C or Ku band and are capable of ship-to-shore links of T-1 (1.544 Mbps) capacity for full motion VTC and other MDR and HDR requirements. These terminals are currently in limited use and are being evaluated as part of commercial wideband SATCOM (formerly Challenge Athena) initiatives and in other operations.

16.2.2.3.5 EHF Low-Data-Rate Terminal. EHF LDR terminals (AN/USC-38(V)) provide protected, flexible, worldwide core and hard core voice, teletype, and data communications to the fleet at speeds from 75 to 2400 bps. Key characteristics of EHF SATCOM terminals include survivability, LPI/LPD, and antijam.

16.2.2.3.6 EHF Medium-Data-Rate Terminal. EHF MDR, an upgrade to the AN/USC-38(V) EHF LDR terminal, provides protected, flexible, worldwide core voice, data, and video communications to the fleet at speeds of 4.8 to 2240 kbps. EHF MDR provides a cost-effective approach to increasing data rates and using the LDR and MDR payloads that will be on MILSTAR II satellites.

16.2.2.3.7 Global Broadcast Service. GBS terminals are planned to provide for direct delivery of smart push/data pull requirements in support of C^4I. These terminals will be used to receive high capacity broadcast for imagery, intelligence, missile warning, weather, live video, and joint service/unique news.

16.2.2.3.8 INMARSAT B. INMARSAT B terminals are the planned replacements for INMARSAT A terminals and are based on digital technology, offering increased capacity for less cost. INMARSAT B provides 64 kbps capacity to support nontactical information transfer, such as PC data transfer, commercial and secure telephone, and video teleconferencing.

16.2.2.3.9 INMARSAT M. INMARSAT M is a lightweight, digital-based SATCOM terminal offering 2.4 kbps capacity for very small ships. As part of ITP, INMARSAT M will bring voice and data satellite connectivity to ships having little or no SATCOM capability.

16.2.2.3.10 Interim Polar Upgrade. Interim Polar provides EHF SATCOM connectivity for C^2 requirements above 65º north latitude, with jam resistance, LPD, and LPI features. The system primarily supports submarine LPI/LPD communications and secondarily supports battle group operations in the polar regions.

16.2.2.3.11 Low Observable Antenna. LOA will be a multifunction antenna used to reduce the number of antennas and the natural interference — electromagnetic and physical — caused by current multiple antenna system architectures.

16.2.2.3.12 Multibeam, Multimission Broadband Antenna. The MMBA is a demonstration program to design, build, and test at sea a single fixed array antenna system that will simultaneously perform the functions of two BGPHES-ST antennas, as well as other X and Ku-band applications. The objective is to solve antenna proliferation and weight, deck space, cross section, and EMI problems.

16.2.2.3.13 Navy EHF SATCOM Program Pre-Planned Product Improvements. NESP P^3I represent a number of efforts required to enhance EHF SATCOM operations, perform MDR, and comply with JCS TRANSEC key directives. The P^3I includes processor upgrade, agile beam management, OTAR, in-band control, and navigational digital data interface.

16.2.2.3.14 Personal Communication System. The PCS terminal will be a digital based, small SATCOM terminal offering worldwide, low cost data, message, and voice services. PCS will support C^3 requirements related to SPECOPs, disaster relief, combat survivor/evader location, GBS (pull function), polar communications, and VIP activities. As part of JMCOMS and ITP, PCS provides the potential for a single device integrating interior and exterior communications systems with ADNS and merging HYDRA-like features with global reach.

16.2.2.3.15 Submarine HDR. SUB HDR is a system that will provide submarines with worldwide, high capacity, dual band (EHF and SHF), antijam, and LPI communication capabilities using MILSTAR, UFO/E, DSCS, and commercial satellites. This system must meet needs for Tomahawk mission data update transfer, SPECOPs imagery transfer, and VTC.

16.2.2.3.16 Television Receive Only. TVRO service provides afloat units with the capability to receive standard TV programs while deployed via satellite transmissions operating in either the C or Ku-band. TVRO is a stand-alone system for quality of life related news and entertainment television until GBS service becomes available.

CHAPTER 17

Record Messages and Voice and Data Communications

17.1 GENERAL

This chapter highlights certain areas dealing with messages and transmission methods and systems. NTP-3 and NTP-4 provide in-depth information and guidance on these subjects and should be consulted if questions arise.

17.2 RECORD COMMUNICATIONS

Record communications include general messages, organizational messages, and E-mail.

17.2.1 General Messages. The general message provides standard distribution to a large group of addressees. It is identified by a short title, e.g., NAVADMIN. Appendix A lists the most common types of currently used general messages, their originators, content, and distribution information. General messages that are of sufficient operational importance to warrant immediate delivery to forces afloat are sent via fleet broadcast.

17.2.1.1 Action Addressees. All commands to whom general messages are distributed are considered action addressees. It is the receiving command's responsibility to determine what action, if any, need be taken. Addressees not under the jurisdiction of the originator or in an area outside the one covered by a particular general message may handle the message as purely informational.

17.2.1.2 Originating General Messages. SECNAV, CNO, CMC, Fleet CINCs, type commanders, force commanders, and certain other commanders are authorized to establish and generate general message series within their cognizant areas. CNO shall be included as an addressee when deemed appropriate.

17.2.1.3 Canceling General Messages. There are three methods used to cancel general messages.

1. For a particular series of general messages, the first general message of a calendar year may list those messages of its own and other general message series of the previous year(s) that remain in effect. For example, ALCOM 001/YR may list ALCOMs that continue to be effective. By omission, all general messages of the series not listed are canceled. If necessary, interim cancellation messages may be sent at other times during the year.

2. An individual general message may include its own cancellation date within the text.

3. General messages of a series for which a yearly cancellation message is not issued are automatically canceled at the end of 90 days. This period of time may be extended by a subsequent general message of the same series issued within 90 days of the original message and stating a date when the message is to be canceled. If 90 days have passed and no extension of time has been effected, a general message must be reissued if it is to remain effective.

17.2.1.4 Broadcast. Fleet, force, or type commanders who originate general and collectively addressed messages are responsible for routing these messages to the appropriate fleet broadcast for the intended units, regardless of the location of the units.

The following general messages are transmitted on the general message schedules of the fleet broadcast, except as specifically exempted by the originator: ALCOM, ALCOMLANT Alfa (Atlantic only), ALCOMPAC Papa (Pacific Only), ALFOODACT, ALLANTFLT (Atlantic Only), ALPACFLT (Pacific only), ALMAR, ALMILACT, ALNAV, ALNAVEUR (Europe only), JAFPUB, NAVADMIN, NAVACT, NAVOP, NAVNEWS, and PACOMACT.

Submarine broadcast authorities will screen general messages for subsequent broadcast to submarines. General messages will be transmitted on the broadcast with their assigned precedence and on a scheduled basis.

17.2.1.5 Service and Requests for Retransmission. Whenever possible, commands that miss general messages should obtain them from commands in company, electronic bulletin board systems, Internet web pages, their serving communications center, or parent squadron in lieu of servicing the serving NCTAMS or NAVCOMTELSTA. Missing general messages can be delivered via guard mail, PC- to- PC transfer, or messenger. Requests for electrical transmission of missing general messages should be made only in urgent circumstances or when there is no other available means of delivery. Only NCTAMS or NAVCOMTELSTAs are authorized to service or request retransmission of general messages from originators. General messages should not be readdressed.

17.2.2 Organizational Messages. Organizational messages are sent from unit to unit while individual messages (E-mail) are sent from individual to individual. There are five classes of Navy organizational messages for administrative accounting purposes and three types according to content. See Figures 17-1 and 17-2.

17.2.2.1 General Considerations. JANAP-128, ACP 121, ACP 121 US SUPP-1, NTP-3, NTP-4, and ACP-123 (DMS) provide detailed guidance on the preparation of organizational messages. It is essential that all drafters of these messages understand the organizational message preparation procedures contained in these publications.

17.2.2.2 Precedence. Precedence indicates the required speed of delivery to the addressee, the order of handling and delivery by communications personnel, and the order in which the addressee should note the message. Speed of service objectives for various precedence levels are found in ACP-121 and NTP-3.

17.2.2.3 Address. The number of addressees shall be kept to a minimum. Only approved plain language addresses listed in the DPVS shall be used. The DPVS contains authorized message addressees that are included in a common source route file.

AIGs are predetermined lists of action/information addressees controlled by a cognizant authority and used for messages containing information of a recurrent nature. AIG cognizant authorities shall continually update their assigned AIGs in accordance with NTP-3 SUPP-1.

The use of an AIG is limited to the cognizant authority and those commands specifically designated by the cognizant authority. AIGs are always addressed for action (i.e., in the "TO" line). These action addressees may be directed to take a message for information by

CLASS		REMARKS	
	A	Official messages of DOD (including Coast Guard in wartime)	
Government	B	Official messages of U.S. Government Agencies other than DOD	No tolls on Navy circuits. Tolls incurred if commercially refiled to reach addressees
	C	Messages in various forms available to ships of all nationalities and containing data such as oceanographic, weather and time information	
Non-Government	D	Commercial messages including press and radiophone; Class D messages are private and unofficial	No longer used. Canceled by NTP 9.
	E	Personal Messages	Personal messages to and from naval personnel. Used primarily to enhance morale. No tolls on Navy circuits. Tolls incurred if commercially refiled.

Figure 17-1. Classes of Navy Organizational Messages for Accounting Purposes

TYPE	CONTENT
Operational	Those directing or affecting the actual use of forces, ships, troops, and aircraft whether real or simulated. Those disseminating weather or other vital reports affecting the safety of life, ships, or forces. Those dealing with high command or nuclear strike coordination, tactical communications, combat intelligence, enemy reports or information having a vital bearing on the disposition, movement, or employment of forces. Those that control communications, cryptography, deception, and countermeasures; hydrographic and oceanographic information; and combat logistics matters. Handling is governed by effective operation orders and EMCON. Handle expeditiously but do not sacrifice reliability.
Exercise	Those relating to exercises conducted for fleet training and readiness. Handle the same way as operational traffic. Messages are identified by EXERCISE (name) following message classification in the text. Text reads “EMERGENCY STOP EXERCISE" and is sent via classified and/or authenticated means. Upon receipt, cease exercise conditions, cease relay of exercise messages, and maintain present circuits until further notice. Code words may be used. The OCE directs resumption of the exercise by classified and/or authenticated message.
Administrative	Matters that are neither operational nor exercise are considered administrative. The highest precedence that may be assigned is Priority, except those messages reporting death or serious illness or injury, which may be assigned Immediate precedence. The capacity of most afloat commands to receive the aggregate of operational and administrative traffic is limited; therefore, administrative messages that include afloat commands shall be kept to a minimum.

Figure 17-2. Types of Naval Messages by Textual Content

including special instructions in the text of the message, e.g., "All action addressees of AIG ____ take this message for information only." Refer to NTP-3 and NTP-3 SUPP-1 for additional details regarding AIGs.

CADs are single address groups that represent a predetermined set of five or more activities linked by an operational or administrative chain of command. CAD cognizant authorities shall continually update their assigned CADs in accordance with NTP-3 SUPP-1.

Rules for readdressing messages are contained in NTP-3. Such procedures should be kept to a minimum consistent with the need to know.

17.2.2.4 Subject Identification. A key element in the construction of a naval message is the assignment of a SSIC in the classification line and the proper use of message subject lines. The SSIC, a six-character code derived from SECNAVINST 5210.11, aids in the automated message distribution process, as explained in OPNAVINST 2100.1 and NTP-3. While SSICs are used in most messages, they are not required in messages handled exclusively on tactical circuits; i.e., not entered into the DISN. Other exceptions are outlined in NTP-3. Similarly, SSICs and subject lines are not to be used in USMTF messages: SORTS, RAINFORM, CASREP, and OPREP. An SSIC is required in a MOVREP, but the subject line is to be omitted.

17.2.2.5 Text. The text is the heart of the naval message and must convey clearly and concisely the thought of the originator. The message drafter must ensure that the text is accurate, brief, clear, and properly formatted. A drafter error that changes the meaning of a message's text should be corrected by an additional message from the originator, not a communications service message.

17.2.2.6 Classification. OPNAVINST 5510.1, The Navy Personnel and Information Security Program Regulation, contains the definitions of the three classifications (Confidential, Secret, and Top Secret), the rules for persons assigning these classifications, and the rules for handling material so classified. Drafters are responsible for ensuring that correct classifications are assigned to naval messages.

A message that refers to a classified message may, if content permits, be given either a lower classification or

FOUO INFORMATION

1. Matters that are related to the internal personnel rules and practices of the Service.
2. Matters that are specifically exempted from disclosure by statute.
3. Trade secrets and commercial or financial information obtained from a person, which is privileged or confidential information.
4. Inter-agency or intra-agency memoranda or letters that would not be available by law to a party other than an agency in litigation with the agency.
5. Personnel and medical files and similar files the disclosure of which would constitute a clearly unwarranted invasion of personal privacy.
6. Investigative records compiled for law enforcement purposes but only to the extent that the production of such records would:
   a. Interfere with enforcement procedures.
   b. Deprive a person of a right to a fair trial or an impartial adjudication.
   c. Constitute an unwarranted invasion of personnel privacy.
   d. Disclose the identity of a confidential source and, in the case of a record compiled by a criminal law enforcement authority in the course of a criminal investigation, or by an agency conducting a lawful national security intelligence investigation, confidential information furnished by a confidential source.
   e. Disclose investigative techniques and procedures.
   f. Endanger the life or physical safety of law enforcement personnel.
7. Matters contained in or related to examination, operating or condition reports prepared by, on behalf of, or for the use of an agency responsible for regulation or supervision of financial institutions.
8. Geological and geophysical information and data including maps concerning wells.

NOTE: Consult SECNAVINST 5720.42 (series) for amplifying information

Figure 17-3. Information That is FOUO

may be unclassified unless the reference directs a classified reply or contains a precautionary warning or notation that an unclassified reply is not permitted.

Instructions for downgrading and declassification of classified material are detailed in OPNAVINST 5510.1 (series).

17.2.2.7 For Official Use Only and Encrypted For Transmission Only. Unclassified messages, the content of which meets the criteria of SECNAVINST 5720.42, shall be labeled UNCLAS FOUO. The labeling, handling, and destruction of these messages shall be in accordance with SECNAVINST 5570.2.

The caveat EFTO is a special handling designation that means "Encrypted For Transmission Only." It is not required in the classification line of unclassified messages addressed exclusively to Navy and Marine Corps commands.

EFTO markings are mandatory only when Navy and Marine Corps unclassified messages are marked FOUO and addressed to a non-Navy/Marine Corps DOD activity outside CONUS. The classification line of these messages will read: UNCLAS EFTO FOUO. Information that shall be labeled FOUO is shown in Figure 17-3.

Fleet commanders are authorized to lift UNCLAS EFTO FOUO procedures when operational necessity dictates for those forces under their operational and/or administrative command.

EFTO procedures are recognized by all DOD agencies and the Coast Guard. EFTO will not be used for messages addressed to foreign nations, NATO, or U.S. agencies outside DOD.

Messages to or from COMNAVSUPPFOR ANTARCTICA, all USNS ships, all hospital ships, and certain USCG ice breakers that have neither on-line nor off-line encryption capability are exempted from UNCLAS EFTO FOUO procedures.

17.2.2.8 Cancellation of Messages. Only originators may cancel messages. They will send a new message to accomplish this. To cancel a classified message, an unclassified message may be sent when using AUTODIN or other on-line covered circuits. Additionally, when in direct communications and able to authenticate the validity of the distant station, an unclassified cancellation message may be sent. In all other cases, the cancellation will be classified.

17.2.3 E-Mail. E-mail is the exchange of information between individuals or organizations by application of PC-to-PC transfer technology, normally in the form of narrative text. E-mail can be transmitted over the Internet, a LAN or WAN, or the DISN. E-mail can be either an official means of information transfer or used for informal exchange of information. Use of E-mail will be regulated and controlled in accordance with existing policies for data transfer and the policies set forth herein.

17.2.3.1 E-Mail Policy. The intent of the E-mail policy is to provide a step towards ultimate inclusion of electronic messaging into the evolving DMS. E-mail is encouraged for both formal and informal communications and will support chain-of-command procedures. Activities are encouraged to include E-mail addresses in published command telephone listings and POC lines in record messages (USMTF GENADMIN). Costs for E-mail systems, including telecommunications support, are the responsibility of the using activity. Acquisition of E-mail capabilities is an ADP acquisition and will be in accordance with SECNAVINST 5000.2.

17.2.3.2 Individual E-Mail. Individual E-mail is E-mail used for working level information exchange between DOD personnel within administrative channels that does not commit or direct an organization.

17.2.3.3 Organizational E-Mail. Organizational E-mail is E-mail that serves as formal communications between organizational elements. Approval for transmission must be authorized by designated officials of the sending organization. Determination of internal distribution is the responsibility of the receiving organization. Some information may impose additional responsibilities and actions of E-mail users to satisfy delivery requirements because of its official and sometimes critical nature.

Commanders designate E-mail as formal or directive in nature when addressed from and to an organizational address. Such use of E-mail constitutes an understanding by those organizations that this type of information transfer does not have the guarantee of delivery provided by the NCTS or AUTODIN.

Organizational E-mail systems shall include procedures for access and handling E-mail including frequency of checking mailboxes, retention, filing, distribution, etc. As a minimum, the frequency of checking for organizational E-mail should be consistent with the frequency of checking normal paper mail — at least twice daily.

17.2.3.4 Classified Information. E-mail may be used for the transfer of classified data only if the system, including the network, is protected for the highest level of classified information passed. E-mail applications used to transfer classified information must have an authentication and audit capability to ensure the authenticity of messages transmitted and received. The security and privacy of each E-mail system and the information transferred via E-mail is a user responsibility.

17.3 VOICE SYSTEMS

Voice systems are sometimes categorized as tactical and nontactical (telephony). In general, tactical systems are used for intra-battle group communications and telephony systems are used for other communications. This distinction will fade as new systems connect voice systems seamlessly.

17.3.1 Telephony Voice Systems. There are several voice systems and instruments in use within the DOD. These include: I-DSN, cellular phones, STU II and III, Red Switch, etc. The voice transmission systems include the DSN, commercial service, and FTS 2000. Red Switch is a special DISN system that connects the unified commanders and certain other high-level individuals.

17.3.2 Navy Tactical Voice Systems. NTP-4 gives a good overview of the secure voice and nonsecure voice systems enabling transmission of ship-shore, ship-to-ship and shore-to-ship voice communications. The information provided includes descriptions of Radio Wireline Interface, Secure Voice Improvement Program, ANDVT, Command Switch System, and DSN Universal Multiline Adapter. Additionally, certain satellites and associated systems, such as the commercial wideband series, provide ships with an I-DSN capability.

17.4 DATA NETWORKS

Like voice systems, data systems are sometimes designated as tactical or nontactical.

17.4.1 Strategic Data Networks. Data transfer within DII utilizes four separate data networks based on the security level of the data transmitted. This will continue to be the case until a true MLS solution is provided. Until recently these networks were known as: MILNET (unclassified), DSNET 1 (Secret), DSNET 2 (Top Secret), and DSNET 3 (Top Secret/SCI). Today these networks are commonly referred to as:

1. NIPRNET for Sensitive but Unclassified IP Router Network — Global
2. SIPRNET for Secret IP Router Network — Global (provides transport for the Top Secret Support System (TSSS))
3. JWICS for Joint Worldwide Intelligence Communications System — Global (TS/SCI).

When the DISN goal architecture is reached; i.e., a MLS capability is fully achieved, the separate system-high networks will merge into a single DISN.

17.4.2 Tactical Data Networks. The Navy operates several tactical data networks (e.g., Link 11, Link 16, OTCIXS, etc.) and participates in a variety of joint data exchange networks (e.g., JTIDS, JDISS, JCALS, etc.). Detailed information on the operation and configuration of these networks is found in various NWPs and Joint Pubs according to the warfare application of the data exchanged over the network.

Part V — Base Line and Transition Information Exchange Systems

CHAPTER 18

Defense Information System Network

18.1 THE DEFENSE INFORMATION SYSTEM NETWORK

The DISN has evolved, and continues to evolve, to support the information needs of the DOD and select U.S. Government agencies. This includes the capability to rapidly assemble and deploy JTFs and CTFs in response to a crisis worldwide. Because JTFs and CTFs must be prepared to mobilize rapidly in response to operational requirements, the availability of robust C^4I systems and the connectivity to support the information needs of these systems is a critical mission success factor in post-Cold War operations.

This versatile communications network includes both radio frequency and wireline transmission systems. The network is broken into three segments, transparent to the user, for management purposes (see Figure 18-1). They are:

1. Sustaining base
2. DISN long-haul backbone
3. Deployed block.

DISA has overall responsibility for end-to-end management of this network. In general, the individual services and agencies are responsible for planning, programming, and managing the sustaining base and deployed block portions. DISA is responsible for providing the DISN long-haul, or backbone, to include establishing appropriate interface standards that allow enterprise-wide integration of all sustaining bases and deployed blocks.

18.2 THE DISN TODAY

Today's strategic and tactical information transport environment is comprised of multiple networks that are costly to maintain, not interoperable, provide limited bandwidth availability to the warfighter, and encompass an independent structure for intelligence requirements. This infrastructure is incapable of keeping pace with the explosion of data, multimedia, and imagery transport requirements, and it does not provide an inherent, rapidly configurable and reconfigurable surge capability to support JTF and CTF requirements.

18.3 TRANSITION TO THE FUTURE

An integrated transmission infrastructure is needed to support requirements for dynamic bandwidth allocation and to replace the individual legacy telecommunications systems with a seamless transport capability that can keep pace with evolving technology and support the changing C^4I demands of the warfighter. Consequently, the DISN Mission Needs Statement, validated by the JROC, establishes the requirements for the post-Cold War DISN infrastructure. Henceforth, all planned C^4I and space-based systems must support the C^4I For The Warrior (C^4IFTW) requirements that will provide unified CINCs, fleet CINCs, CJTFs, and CTFs with integrated connectivity among all theater and tactical elements through modernized, jam-resistant telecommunications network support.

To support these mission requirements, DOD will incrementally evolve toward a global common user transmission infrastructure that provides sufficient bandwidth for high-volume exchange of voice, data, imagery, and video information; integrated wide area networking interface to local area networks; enterprise-wide integration of network and system management capabilities; and a seamless, global transport infrastructure for value-added services, such as the GCCS and the DMS.

18.4 SERVICE-MANAGED SEGMENTS OF THE DISN

In general, the individual services manage both the sustaining base and the deployed segments of the DISN. The sustaining base level is also referred to as the BLII or sometimes, within the Naval establishment, as the NII.

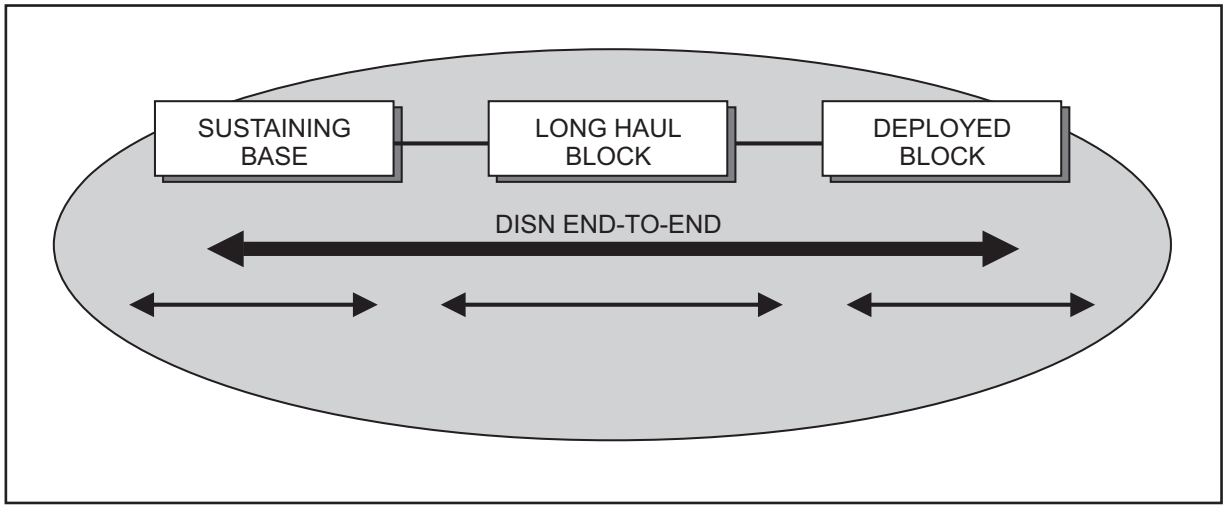

Figure 18-1. DISN End-To-End

The deployed segment consists of the equipment that provides connectivity between the DISN backbone and the deployed units and platforms of all services and is usually referred to as the tactical tail of the end-to-end connectivity.

18.4.1 Base Level Information Infrastructure. The BLII is comprised of inside and outside cable plants and any equipment connected that is installed as an integral part of the base infrastructure, such as telephone switches, network concentrators, routers, and servers. BLII does not include security resources or any infrastructure that supports a single system.

18.4.2 Deployed Segment. The deployed segment includes those equipment and systems that complete the pipeline for information flow from the DISN backbone to a deployed unit of any of the services. These include systems such as UHF SATCOM, CUDIXS, and NAVMACS II.

18.5 DISN SERVICES

The DISN backbone, coupled with the two service-operated portions of the network, is the highway over which the following services, among others, travel: secure and nonsecure voice systems, data, video, and record communications.

18.6 DEFENSE MESSAGE SYSTEM

DMS is a DOD-wide system that replaces AUTODIN, some Stove-piped tactical messaging systems, and the majority of the proprietary E-mail systems in use with a single writer-to-reader desktop messaging system. The migration to DMS has already begun and will continue well into the next decade. A key milestone of the DMS transition will be the deactivation of the AUTODIN system in 1999.

Most users will access the DMS through an icon on their desktop PCs. At full operational capability, a DMS user anywhere in the world — afloat, ashore, even airborne — will be able to send and receive not only traditional messages and E-mail but also pictures, graphics, voice, video, and various other kinds of attachments. Thus, when fully fielded, DMS will abolish traditional distinctions between long-haul and tactical messaging systems, between GENSER and special intelligence messaging systems, between organizational messaging and E-mail systems, by transforming what is now a multitude of splintered, Stove-piped systems into a seamless path between any writer and any reader within DOD. It will also provide links to NATO, other Allies, and non-DOD components of the U.S. Government. Detailed information about the transition to DMS is contained in DISA's DMS Target Architecture and Implementation Strategy document, as well as various other DISA and DON DMS implementation and transition documents. Figure 18-2 depicts a notional DMS architecture.

18.6.1 DMS Components. DMS components include both hardware and software and will interface with existing backbone infrastructures such as DISN and BLII. In general, DMS applications are designed to run on 486 or better PCs with a minimum of 16 MB RAM. These PCs must have a PCMCIA reader capability for the Fortezza cards and should also have CD-ROM capability. The DMS has four subsystems:

1. Message handling system

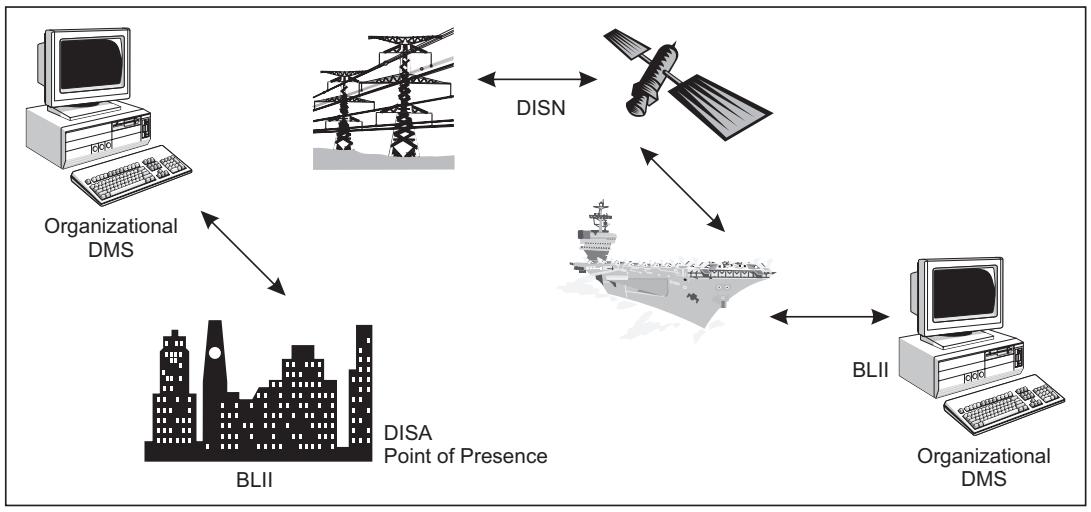

Figure 18-2. Relationship of DMS, BLII and DISN

2. Directory system

3. MISSI-based security system

4. Service management system.

18.6.1.1 X.400 Message Handling System. The MHS is composed of several components.

1. The user agent is an application program that resides on an individual user's PC. It allows the user to create, store, secure, release, and receive both organizational and individual messages.

2. The profiling user agent provides for receipt, analysis, and onward distribution of messages.

3. The mail list agent expands a single entry mail address into a list of recipients.

4. The multifunction interpreter provides interface with non-DMS users such as NATO and users of SMTP. It is also being used as a transitional interface between DMS users and JANAP 128 AUTODIN message formats until AUTODIN is phased out in about 1999.

5. The message transfer agent provides the message switching capability to route messages through the communications infrastructure from source to destination. There are three levels of MTA arranged in a hierarchical architecture. They include, from lowest to highest level, the subordinate MTA at the unit or base level, the intermediate MTA, and the backbone MTA.

6. The message store is software that provides the capability for messages to be stored and retrieved at the recipient's convenience, either at their normally used PC or at another location.

18.6.1.2 X.500 Directory System. The directory system allows the automated upkeep of the directory of DMS users with names, addresses, and information about user's privileges, authorizations, identification, and other data.

1. The directory system agent stores directory entries and performs the addressing function, among other things.

2. The directory user agent provides the individual user's access to the DSA to retrieve message addresses and perform other functions, as required.

3. The administrative directory user agent provides the capability to create, update, and maintain address entries in the DSA.

18.6.1.3 Security Systems. DMS will use writer-to-reader encryption. Several components comprise the DMS security system, including a specialized message security protocol.

18.6.1.3.1 Fortezza Cards. The Fortezza card is a PCMCIA card that contains the user's public and private keys, the user's security clearances, authorizations, privileges, data storage key, and other cryptographic elements. The card can also contain several personalities that are equivalent to the user's individual and organizational roles. Fortezza cards will be used for Sensitive But Unclassified and Unclassified applications and Foretezza+ cards will be used for classifications of Secret and below.

Information about security systems being planned for Top Secret and SCI level requirements is contained in Chapter 29.

18.6.1.3.2 Certification Authority Workstation. The CAW will program Fortezza cards, manage X.509 certificates, and generate certificate and key revocation lists.

18.6.1.4 DMS Management Systems. Since DMS spans the globe, it will be managed by DISA through a three-tiered hierarchical structure of local, regional, and global control centers. The DMS service management system provides fault, performance, configuration, security, and accounting management capabilities.

Local management will be performed at the installation level by LCC. The LCCs are located on military installations and DOD agency facilities, with the military service and agency responsible for this level of management. The LCC performs component management while consolidating status information into reports and forwarding them to a designated RCC.

There are three RCCs proposed for DMS, one for each major DISA region — Western Hemisphere (WES), Europe (EUR), and Pacific (PAC). Each RCC performs active management of the DMS regional components, collects status reports from LCCs, and provides turnover management control for each LCC in its region. An RCC has the authority to assume control of any LCC within its region; however, an RCC is not authorized to assume control of any other RCC's area of responsibility without prior authorization from the GCC.

The GCC does not actively manage any DMS component on a routine basis. The GCC performs executive oversight of DMS by monitoring certain elements of the RCCs, periodically accepting reports, and maintaining a global view of DMS. The GCC is authorized to request a status report from any RCC or LCC.There is one GCC and it is located at DISA headquarters in Washington, DC.

CHAPTER 19

The Naval Computer and Telecommunications System

19.1 MISSION

The mission of the NCTS is to provide and maintain reliable, secure, and rapid connectivity and support for Navy and national C^4I systems in order to meet the needs of naval and other military commanders, facilitate naval administration, and satisfy JCS approved requirements of those DISN facilities assigned to the Navy for operation.

19.2 DEFINITION

The NCTS is a complex of equipment, systems, subsystems, and networks that provides requisite telecommunications support for the operation, command and control, and administration of the Navy. It encompasses portions of the DISN, the NCS, and most of the Navy's afloat and ashore telecommunications connectivity resources used for fleet, surface, air, and subsurface support.

To meet Joint, Navy, or Marine Corps operational requirements, the NCTS may be expanded or extended to incorporate or interface with the telecommunications systems of other services, nations, or treaty organizations.

To provide definition and for system engineering purposes, the NCTS includes all end terminal processing equipment necessary for the telecommunications function of end-to-end information transfer. This includes all media for the transmission, emission, or reception of signs, writing, images, and sounds or information of any nature by wire, radio, visual, electromagnetic, electro-optical, or acoustical systems. Unless specifically exempted, all such systems afloat, ashore, and airborne are considered part of the NCTS. The following are not part of the NCTS:

1. Intra-task group/force communication systems (e.g., ship-to-ship, ship-to-air, and air-to-air systems).

2. Passive communication intercept systems and associated terminals under control of COMNAVSECGRU.

3. SPINTCOM and CRITICOM terminals.

4. Radio determination, radio astronomy, radiosonde, and navigational stations or devices, except when specifically arranged.

5. Postal and guard mail systems.

6. Certain portable communications equipment (e.g., pagers) and certain base systems (e.g., harbor control and security systems radios).

7. Naval air traffic control and navigation aids and landing systems (NAALS).

8. Marine Corps organic telecommunications systems operated and managed by the CMC. However, Marine Corps telecommunications are an operational extension of naval telecommunications and employ the communications operational procedures used within the NCTS.

9. Telemetry and measurement instrumentation systems used to perform physical measurements (e.g., as of displacement, velocity, acceleration. mass, time, position, pressure, spectrum, distance, etc.) and to provide the results to a recording or display station and not involving other communication applications.

10. Portions of the BLII (inside cable plant) on some naval installations and most legacy E-mail and VTC systems. Over the next few years, legacy

systems must migrate to DMS and will become part of the Navy-managed segments of the DISN (see paragraph 18.1).

19.3 JOINT MARITIME COMMUNICATIONS STRATEGY

The JMCOMS architecture will transition the Navy's deployed segment to the DISN target architecture, as described in paragraph 18.4.2, providing deployed task forces with IP, ISDN, and ATM technologies. As currently envisioned, JMCOMS will be implemented in three phases or builds between 1997 and 2000. Figure 19-1 is a notional depiction of JMCOMS after complete implementation.

19.4 POLICY ON OPERATIONAL DIRECTION OF NCTS ASSETS PROVIDING DIRECT FLEET SUPPORT

Authoritative direction and control of naval broadcast, ship-shore, air-ground, and other telecommunications functions for direct fleet support performed by activities of the NCTS is assigned to the appropriate Fleet CINC. This authoritative direction and control includes determining the adequacy of the telecommunications arrangements and their effectiveness in satisfying the operational requirements of the operating forces with due consideration being given to the system- and Service-wide aspects involved. In this respect, direct coordination between COMNAVCOMTELCOM and the Fleet CINCs is authorized.

Direction of those portions of the NCTS that also comprise the DISN (e.g. DSCS terminals, DMS, DSN, etc.) is a DISA responsibility and will be executed through DISA's global, regional, and local management structure. These reporting facilities are often located at and are an integral part of NCTS activities.

19.5 NCTS ACTIVITIES

The principal shore commands having telecommunications responsibilities are NCTAMS and NAVCOMTELSTAs, which are under the administrative control of COMNAVCOMTELCOM. Details on the operations and services provided by these activities, as well as notional organizational charts, are contained in NTP-4. A listing of these activities is contained in Appendix B of this publication.

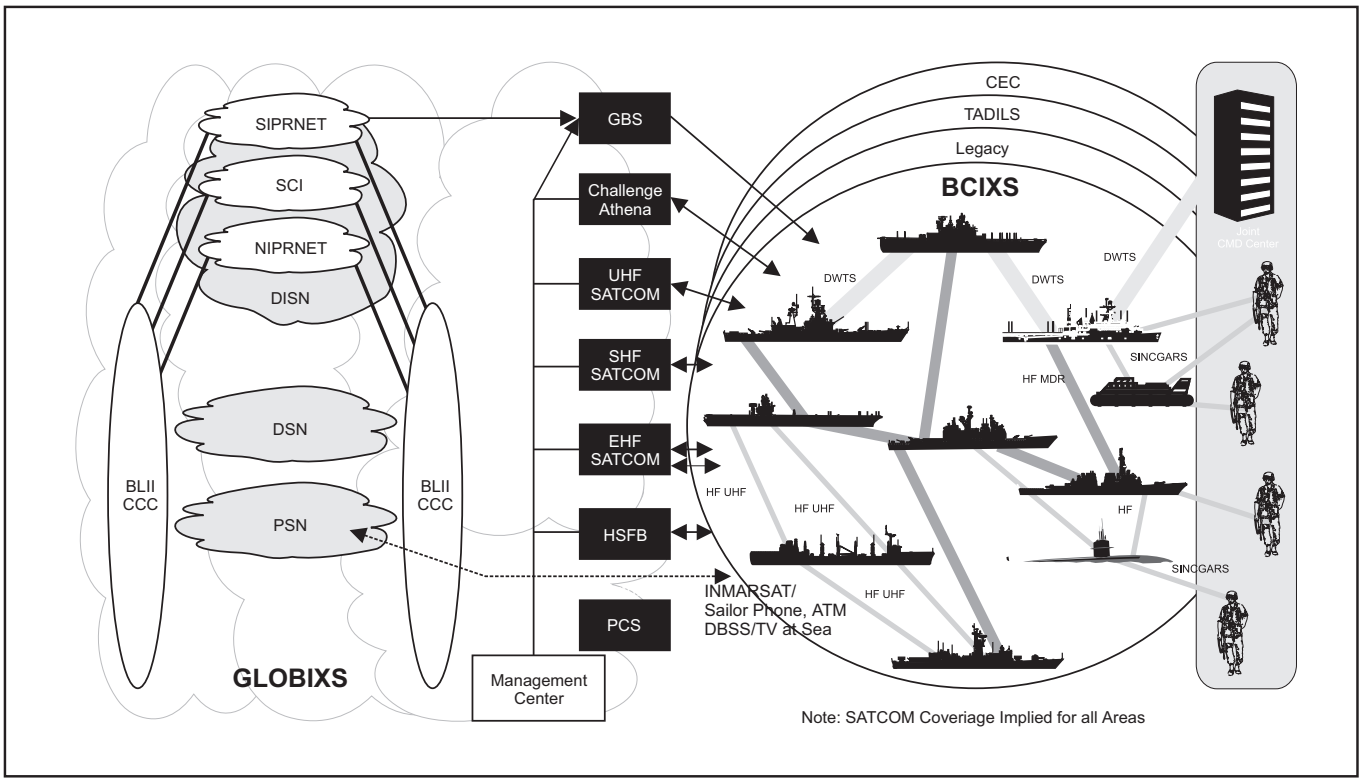

Figure 19-1. JMCOMS Connectivity

19.6 OTHER POLICY CONSIDERATIONS

The following policies apply to activities of the NCTS.

19.6.1 Duties of Personnel Assigned to NCTAMS and NAVCOMTELSTAs. The duties of communications personnel assigned to NCTAMS and NAVCOMTELSTAs should not include the following:

1. Service as messengers for delivery of traffic except as a last resort. Individuals, staffs, commands, and departments not fully supported by electronic message delivery shall provide their own message pickup services.

2. Identification and correction of errors in message preparation. Preparation of messages in proper format and review of messages for proper spelling, etc., is an administrative function of the drafting and releasing offices.

When special services are required, they should be set forth in a mutually agreed intra-Service support agreement.

19.6.2 VLF Assistance to Superintendent U.S. Naval Observatory. The Superintendent of the U.S. Naval Observatory is the principal DOD authority responsible for precise time and time interval (frequency matters). As such, the Naval Observatory monitors and records the VLF transmissions from Rugby, UK; Cutler, ME; Jim Creek, WA; Lualualei, HI; and Harold E. Holt, AS for frequency sources and phase variation and compares the signals with primary frequency sources. In addition, the Naval Observatory promulgates VLF transmission deviations from universal time and is the principal interface with other DOD, civilian, national, and international agencies that have legitimate requirements for information on the status of VLF signals.

The Naval Observatory has been requested to assist the FAA in establishing a Notice to Airmen service advising the status of VLF communications for Navy and national navigational purposes. The critical aspect of this service is knowledge of VLF transmission outages. To assist in the foregoing functions, the Naval Observatory requires timely information on planned changes in VLF transmission frequency, emission, maintenance schedules, downtimes for repairs, and after-the-fact outages of more than 10 minutes. Except for a cesium beam abnormality, the Naval Observatory will not publish details on reasons for VLF anomalies.

In order to derive required data on VLF transmissions, COMNAVCOMTELCOM subordinate activities that operate VLF transmitters will include NAVAL OBSERVATORY WASHINGTON DC as an information addressee on all message reports of changes in VLF transmission (outage or restoral) and in CIB-2 changes for scheduled maintenance. The Naval Observatory will, in turn, advise concerned stations and COMNAVCOMTELCOM of any observed significant deviation in phase or frequency for which the cause is unknown.

CHAPTER 20

Copernicus Architecture — Forward to the 21st Century

20.1 COPERNICUS CONCEPTS

In the 1980s, companies like Apple and IBM revolutionized industry by introducing the first desktop computers and the Information Age was born.

The Navy recognized the potential of using information as a warfighting tool and, in 1990, published The Copernicus Architecture. Copernicus is the Navy's initiative to make C^4I systems responsive to the warfighter, to field these systems quickly, to capitalize on advances in technology, and to shape Navy doctrine to reflect these changes. Copernicus provides a comprehensive, analytical approach to information warfare that fully prepares the Navy and Marine Corps team to meet the challenges of the 21st century.

20.2 COPERNICUS FUNDAMENTALS

Copernicus is designed as a user-centered C^4I information management architecture. There are five essential attributes provided by Copernicus:

1. Blending critical tactical, operational, and administrative data going to the warfighter onto one workstation with common applications.

2. Assimilating required information rapidly through standardized data formats so that operational commanders can "pull" desired information. A two-way intelligent "push" capability supplements the user-pull when required and prevents information overload.

3. Providing information using integrated data formats in a multimedia environment where form fits function.

4. Providing a common operating environment that standardizes workstations for the operator. This increases operator proficiency while reducing training costs.

5. Using common building blocks for modular and standardized hardware design thus permitting upgrades and additions to the architecture in a speedy and cost-effective manner.

20.3 THE COPERNICUS PILLARS

The Copernicus Pillars are an interactive framework that link the C^2 processes of warfighters at all echelons of command (see Figure 20-1).

1. GLOBIXS supports the Joint and Allied tactical commanders by providing access to all required information from any location through a series of wide area DCS networks.

2. The CCC serves as the primary gateway for communications and information flow from GLOBIXS to forward-deployed warfighters through TADIXS.

3. TADIXS is composed of tactical data networks connecting the CCC with the TCC. These tactical networks fall into four categories: command, direct targeting, force operations, and support.

4. The TCC disseminates information to the warfighter. It can be any forward-deployed command center afloat or ashore, mobile or fixed. The TCC is the gateway for information flow between the TADIXS and the warfighter.

5. The BCIXS is comprised of tactical networks supporting the battle cube environment regardless of the environmental element in which the battle is engaged (sea, air, or land).

Copernicus thus provides a common tactical picture with seamless connectivity from sensor to shooter.

20.4 COPERNICUS AND CONNECTIVITY

Communications connectivity links nodes throughout the Copernicus architecture to implement the shooter-to-sensor construct. Rapid, reliable connectivity is the cornerstone of C^4I. Connectivity is critical to the common tactical picture because it provides the managed bandwidth for timely transmission of imagery, video, voice, and data. It is critical in peace, crisis, conflict, humanitarian support, and war. Its source is the widely distributed infrastructure composed of the information assets owned and/or operated by each of the services and DISA (i.e., the DISN and Service unique tactical tails).

Continuing expansion of available bandwidth to the warfighter will be a hallmark of Copernicus in the 21st century. Exploitation of fiber-optic wavelength multiplexing techniques, direct satellite broadcast, and wideband transmission systems will sustain the Copernicus evolution and result in increased precision and lethality of warfighting techniques and, ultimately, the survivability of the warfighter. In addition, these technological advances will allow other quality of life enhancements for personnel, including telemedicine, teletraining, tele-education, or even a phone call home from a remote site.

20.5 TRANSITIONING TO COPERNICUS

Copernicus is an evolutionary architecture. It employs a building block approach to accommodate innovation. The first major step in fielding Copernicus was the implementation of JMCIS. The JMCIS architecture links C^2 systems into functional categories and creates an environment for the Services to field interoperable systems with common user interfaces. JMCIS has already migrated several stovepiped systems into a single workstation to produce a common tactical picture. Navy and Marine Corps systems will continue to migrate into the JMCIS architecture as Copernicus evolves. JMCIS forms the kernel of the GCCS. When fully evolved, the GCCS will support an open system for automated information processing at all warfighting levels of the DOD. The GCCS, in a departure from traditional programs, promotes a rapid migration strategy that cost-effectively and continuously builds on changing technology and user information needs.

In summary, the anticipated fast pace of future conflicts dictates fundamental changes in the way joint forces organize, plan, and execute warfighting. New concepts of operation and doctrine will force C^4I systems and architectures from linear, centralized constructs to simultaneous, adaptable systems allowing almost continuous planning, execution, and re-planning in near-real and real time. Copernicus provides the warfighter with this leading edge architecture.

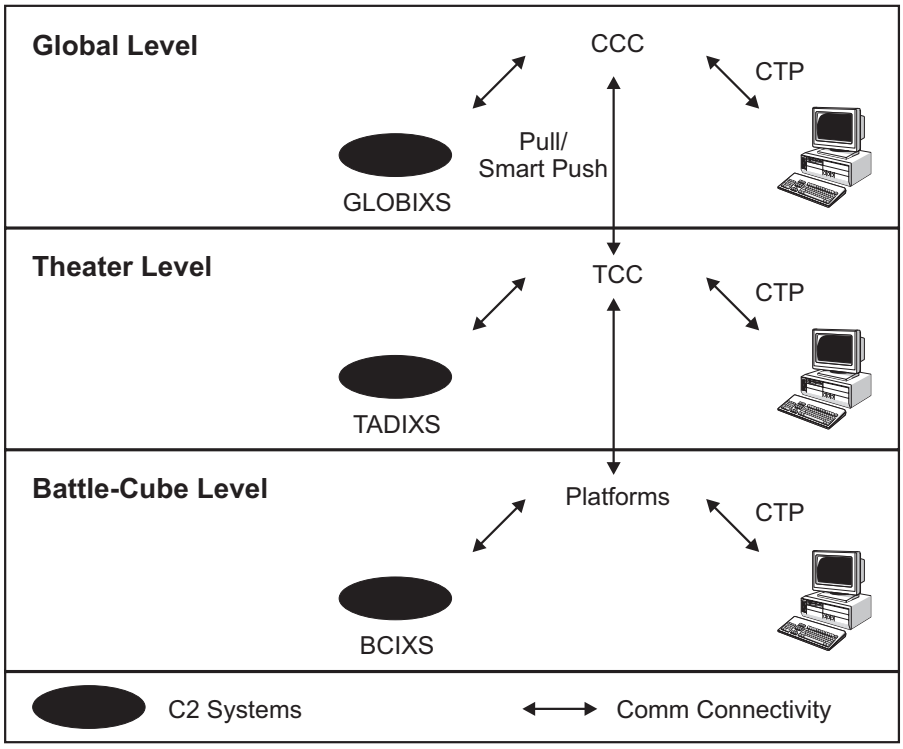

Figure 20-1. Copernicus Concepts

Part VI — Communications in Support of Operating Forces

CHAPTER 21

Fleet Surface Communications

21.1 FLEET BROADCAST

The most common method of passing messages from shore to ship is the fleet multichannel broadcast or FLTBCST, as it is usually referred to. During the past 20 years the FLTBCST has remained essentially the same. Sixteen channels — 15 for information, 1 for timing — running at 75 baud (100 words per minute) were multiplexed onto a single frequency, providing an aggregate speed of 1.2 kbps. Certain channels contained information targeted at certain ship classes — such as surface combatants, amphibious, auxiliary — so that a ship was only required to copy two or three applicable channels. Initially, the FLTBCST was transmitted on multiple HF paths but the advent of satellite systems allowed the broadcast to migrate to satellite. As satellites and satellite receivers became more available, the HF broadcast was phased out. All segments of the broadcast are now on satellite channels.

21.1.1 Broadcast Control Authority. The BCA determines the channel alignment and information carried on each channel. The BCA for the first six to eight channels is usually the Fleet CINC. The remaining channels are assigned specific functions, such as message rerun, battlegroup broadcast, weather, or intelligence traffic. The channel alignment for any given broadcast can be found in the appropriate regional CIB.

21.1.2 Broadcast Control Station. The BCS, now combined with the BKS, is the organization that actually radiates the broadcast. In the case of satellite broadcasts, this is the NCTAMS for each NAVCOMMAREA. The BCS can be identified by the structure of the broadcast channel identifier. The first letter of the channel designator, such as GMUL, will tell the recipient which NCTAMS is keying the broadcast — L for LANT (LMUL), P for PAC (PMUL), G for IO (GMUL), and M for MED (MMUL).

21.1.3 Broadcast Off-the-Air Monitor. In an effort to ensure the quality of the broadcast signal that is received, the BCS can conduct OTAM procedures. This was a normal practice when HF was the only medium for the broadcast; however, the quality of satellite transmissions is so high that OTAM is only used when there is a reported problem.

21.1.4 Copying the Broadcast and Guard Arrangements. Prior to the introduction of other delivery systems, such as CUDIXS, Gateguard, and PC-PC transfer, a ship at sea had to receive all messages via the broadcast. The channels that a ship copied were based on the type of ship. Each ship copied a common channel, a type channel, an overrun channel (if activated), and a specialized channel, such as intelligence or weather, if required.

The common channel carried messages for everyone on the broadcast. This included promotion lists, navigation updates, general messages, and other information requiring wide dissemination.

The type channel was for messages to a ship type, such as a surface combatant or amphibious unit. Aircraft carriers did not copy a type channel since they used a full period termination to receive traffic.

The overrun channel served two purposes:

1. When a primary channel was overloaded traffic was sent to the overrun.

2. When there was no need for overrun messages, messages from other channels were rerun one hour later to allow the capture of a lost message.

Prior to getting underway, a ship sends a guardshift message and shifts its communications guard to the ship's communications center. The guardshift message tells the BCS what channels the ship is guarding and any other means of delivery to the ship. Large ships, such as aircraft carriers or command and control ships, that do not routinely pass their guard ashore, must submit their communications support requirements message monthly in accordance with NTP-4.

21.1.5 Broadcast Control and Loading. Today's FLTBCST is completely automated. Unless there is a problem with a message passing through the Fleet Center or NAVCOMPARS, there is no human intervention ashore. Strict formatting and procedural discipline must be followed to prevent an excessive amount of manual intervention from being required or backlogs can quickly build that create excessive loading conditions on certain channels or on the broadcast in general.

Problems usually occur when a major operation is beginning and a great deal of message traffic is being passed. During these periods the Fleet CINC and the NCTAMS may take any of several measures to control the loading.

21.1.5.1 Precedence Control. The BCA will direct that all messages below a certain precedence will not be delivered to the FLTBCST but be held in local queue or at ASC until the load decreases.

21.1.5.2 Enforcement of Procedures. CTFs will ensure that messages are properly addressed for delivery on the correct circuits. Messages destined to other ships in the TF should be sent on circuits that are only in that TF (i.e., TF/TG Tactical Working.) If a message must be sent outside the TF, the communications prosign ZEN — which means delivered by other means — should be used on all addressees in the TF to whom delivery has been so protected. This will relieve the broadcast of delivery responsibility for those flagged addressees. Additionally, drafters must avoid dual addressing — including a command's PLA on a message when the command is part of the TF collective.

21.1.5.3 Use of Proper Path. CTFs will ensure that senders from ashore use the proper path for large messages. The ATO is an excellent example. CTAPS terminals have been fielded on ships specifically for the delivery of the ATO to the command ship or aircraft. This should be the only shore-ship path used. If ATO products are needed by other ships, there are paths designed for that (i.e., PC-to-PC transfer).

21.1.5.4 Message Screening Board. The Fleet CINC will convene a MSB to review traffic. This board will consist of representatives of the Fleet CINC, NCTAMS, and type commanders. The purpose of the board is to screen all messages below immediate to determine if they will be delivered during the operation, after the operation, or not at all.

21.1.6 HF Broadcast Service. As discussed earlier, the HF segment of the FLTBCST has been discontinued. However, a tailored HF broadcast can be put into service in an emergency if a ship has lost the satellite broadcast and is not in company with another ship. This broadcast will be activated when a request is made to the JFTOC via COMMSPOT. COMMSPOT format and procedures are contained in NTP-4. The high speed fleet broadcast also has a HF component that can be activated if required.

Since HF broadcast service is not provided continuously, the appropriate CIB should be consulted to determine the station from which HF services should be requested.

21.2 SHIP-SHORE-SHIP COMMUNICATIONS

Ship-shore-ship communications methods have progressed technologically in recent years. This section briefly addresses the most common methods of getting messages from ship to shore to ship. The appropriate regional CIB should be consulted to determine the availability of these methods.

21.2.1 CUDIXS and NAVMACS. CUDIXS is the shore-based equipment suite most commonly used to send messages to and from ships. On afloat platforms, NAVMACS is the message terminal of choice. The NAVMACS system allows for automatic screening of the broadcast, using a command-unique command guard list that is loaded into the NAVMACS and screens for addressees that the ship guards for. NAVMACS also allows for the transmission of messages via satellite back to the shore CUDIXS suite for further processing and onward distribution.

CUDIXS is a network that can accommodate up to 60 users on a single satellite channel or DAMA time slot. Users are defined with special SIDs. Special SIDs can send and receive all types of naval messages, as well as circuit management and OTO messages.

Prior to 1991 there were only 10 special SIDs slots available on a given satellite slot. The rest of the subscribers were assigned primary SID status. Subsequent software changes in CUDIXS have given all SIDs the capability to be special. The distinction has now faded since most hardware applications support the new software. CUDIXS uses a polling method that queries first for Flash traffic, then queries in order of SID assignment for queued traffic.

The net control station does not spend a great deal of time polling at each SID. Consequently, a large message may take several rounds of queries to get off the ship but this seldom impacts message delivery times.

21.2.2 Primary Ship-to-Shore. Primary ship-to-shore has long been a standard for passing messages ashore. Originally, it consisted of a 100-wpm, HF duplex circuit that required ships to take turns, sending messages ashore based on the precedence of the messages. Another version of ship-to-shore communications, called a full period termination, permitted ships with large traffic loads to have dedicated HF frequencies assigned on which to pass message traffic. Following the advent of SATCOM and the fielding of CUDIXS, primary ship-to-shore features have been added to satellites. Currently, the introduction of high-speed HF modems and PCs emulating teletype machines have increased the operating speed of primary ship-to-shore to 2.4 kbps.

21.2.3 PC-to-PC Transfer. PC-to-PC transfer is now available at each NCTAMS. This allows the use of a secure telephone line (STU-III) or a satellite channel to pass message traffic.

21.2.4 Other Methods. Based on a ship's capability, other methods of passing ship-to-shore traffic include MARCEMP and Afloat Gateguard.

21.3 SHIP-TO-SHORE VOICE

Ship-to-shore voice encompasses satellite narrowband secure voice, satellite telephone systems, and traditional HF voice capabilities.

21.3.1 Satellite Narrowband Secure Voice. The first networked, secure satellite voice system was carried on a satellite's 25 kHz narrowband channel and was a free net that could be accessed by any ship utilizing analog, channel vocoder-based technology. It has subsequently been replaced by ANDVT, which has greatly improved the quality of satellite voice circuits and can also be used with DAMA. ANDVT is currently the primary UHF satellite secure voice system in use, although the KY-58 VINSON is still in use to support certain joint operations. ANDVT hardware is also used on HF, SHF satellite, and EHF satellite systems. Calls made ashore using ANDVT equipment (SATCOM on UHF and TACTERM on SHF) can be patched to secure telephone systems through the NCTAMS RWI. An EHF RWI capability is under development. CIBs contain additional information.

21.3.2 Satellite Telephone Systems. There are three major satellite telephone systems in use.

21.3.2.1 INMARSAT. As discussed in Chapter 16, INMARSAT provides commercial telephone services to any ship that can accommodate an extra antenna.

21.3.2.2 STEL. A secure telephone system, STEL derives its name from the Stanford Telecommunications company, which manufactures the modem that converts the analog voice signal from a STU-III to a digital signal for use on a SHF satellite path. It has the advantage of using only 2.4 kbps of SHF bandwidth to support a telephone line. Its limitations include the fact that initial models are only capable of secure operations, shipboard modems require a matching shore modem, and the caller must be calling a phone number with a STU-III attached. While STEL is in wide use, it is slowly being replaced by I-DSN.

21.3.2.3 I-DSN. I-DSN uses the same technology as commercial long distance telephone service providers. Ships using SHF, commercial, or commercial wideband satellite systems are able to connect the ship's telephone system to the satellite through a smart multiplexer. Because these high-capacity satellite paths are bulk encrypted, the RF path is secure but, if the telephone is not a STU-III, the path from the shore termination point through the public phone network is not secure. Since most SHF equipped ships use smart multiplexers, special equipment is not necessary. All that is required is to program the multiplexer. Although I-DSN supports STU-III telephones, one is not needed unless end-to-end security is required. Nonsecure calls can be easily placed with a conventional telephone. I-DSN requires considerably more bandwidth than STEL. It uses 16 kbps for nonsecure and 32 kbps for secure connections. However, in some cases and dependent on the type of multiplexer and software used, both secure and nonsecure calls can be accomplished at rates as low as 2.4 kbps.

21.3.3 HF Voice. Prior to satellite communications, there was a small amount of voice systems available for placing calls ashore. Most of them have fallen into disuse or have been discontinued; however, one HF voice system — the High Command net or HICOM — is still in use and has recently been renamed HF Global. HF Global is the result of a DOD effort to consolidate HF radio resources. In 1994, the Navy agreed to combine HF HICOM with the Air Force HF Global network. This system allows operational units to reach high-level commanders via HF radio and, in some cases, a patch through the public switched network or the DSN. Initially, the Navy continued to use this HF capability as a nonsecure asset; however, efforts are underway to transition HF Global to secure operations. Additional information on HF Global may be found in appropriate CIBs.

21.4 U.S. NAVY SHIP COMMUNICATIONS IN FOREIGN PORTS

Communications by U.S. Navy vessels during port visits is governed by the local status of forces agreements. These agreements, and the communications restrictions imposed by them, ensure that there is no interference with commercial and private communications in host nations. As a result, each ship must include information on their communications requirements in the Visit Request message and the LOGREQ message sent prior to a port visit.

21.5 PLANNED SYSTEMS

New systems are continually in development or testing. Several initiatives being pursued under the JMCOMS umbrella will have a very beneficial impact on the tactical communications and information transfer requirements of the operating forces.

CHAPTER 22

Fleet Submarine Communications

22.1 SUBMARINE ROLES AND MISSIONS

Submarine communication assets and capabilities were previously optimized to support Cold War missions. Now, re-prioritized roles and missions for the submarine force — as outlined in "From the Sea" and "Forward From the Sea" — require greater information throughput than traditionally existed with submarines. New communication suites must support strategic communications, including multiple pathways capable of performing C^4I functional requirements throughout a nuclear conflict. They must also permit seamless interoperability and access to the common tactical picture found within the battle group, reception of large data file transfers for Tomahawk strike planning, and reception and transmission of video, voice, facsimile, and imagery while operating with combined and joint forces in the littoral regions.

22.2 SUBMARINE COMMUNICATION CAPABILITIES

Submarines communicate via multiple, complementary, radio frequency systems and paths, covering nearly all the military communications frequencies. Because of the operational requirements imposed on submarines to maintain their "stealth" edge, no one communications system or frequency band can support all submarine communication requirements. For example, UHF SATCOM provides a relatively high data rate and throughput but requires the submarine to expose a detectable, mast-mounted antenna. Conversely, ELF and VLF broadcast communications provide submarines a high degree of stealth and flexibility in speed and depth, but are low data rate, submarine unique and simplex, shore-to-submarine only. Figure 22-1 depicts the notional speed and depth limitations placed on the submarine by various communication circuits.

22.3 SUBMARINE SHORE COMMUNICATIONS INFRASTRUCTURE

The submarine communications system is an end-to-end system with connectivity established between the submarine and the submarine shore communications facility. The shore facilities are located worldwide and consist of ELF, VLF, LF, HF, and SSIXS/OTCIXS shore sites. In the future, submarine high data rate communications using EHF, SHF, and commercial satellite RF resources will become an integral part of the submarine shore C^4I infrastructure. Using all shore site assets, submarine C^4I connectivity is assured. Submarine shore sites have the capability to be either transmitting sites, receiving sites, or both, depending on their assigned function and use within the RF spectrum.

22.3.1 ELF, VLF, and LF Communications. These communications are covered in detail in Chapter 16.

22.3.2 TACAMO. The Navy TACAMO program provides a survivable communications link during transattack and post-attack phases of conflict. It enables the President and Secretary of Defense to directly contact submarines, bombers, and missile platforms protecting our national security through strategic nuclear deterrence.

The TACAMO program assets consist of two squadrons totaling 16 E-6A aircraft and a wing component located at Tinker Air Force Base, Oklahoma City, OK. As part of the DOD Airborne Command and Control consolidation, the Navy E-6A aircraft has been chosen as the common airframe to accommodate the USSTRATCOM Battle Staff and provide C^4I capabilities to all three legs of the strategic triad. As Air Force EC-135 aircraft are retired, E-6A communication and staff capabilities will be modified to provide an integrated TACAMO/ABNCP, which will be designated the E-6B.

22.3.3 Submarine HF. The submarine shore HF infrastructure is operated and maintained by COMNAVCOMTELCOM and consists of several HF receiver and transmitter sites situated worldwide.

The HF receiver sites support the submarine Circuit Mayflower and Clarinet Merlin systems while the HF transmitter sites rekey the strategic SSBN submarine

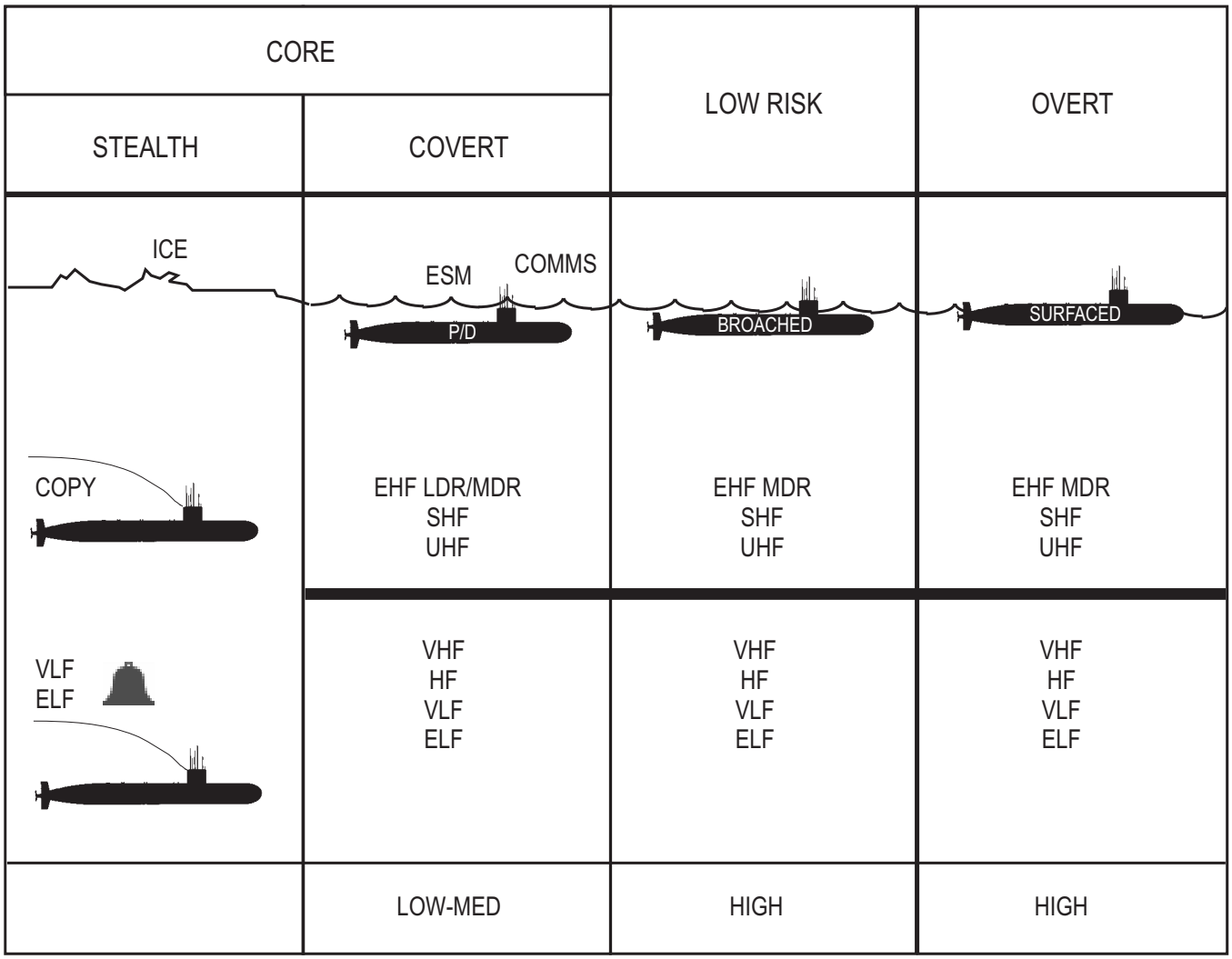

Figure 22-1. Communication Capabilities for Submarine Operations

broadcast. Functional control of the Clarinet Merlin and Circuit Mayflower programs are being transferred to the submarine type commanders — COMSUBLANT and COMSUBPAC. Type commanders will assume the lead responsibility for operation of the Circuit Mayflower and Clarinet Merlin systems in their respective areas of responsibilities. NCTAMS LANT, Norfolk, VA will maintain responsibility for maintenance of the Circuit Mayflower system worldwide.

22.3.4 Submarine Satellite Information Exchange Subsystem. SSIXS provides UHF SATCOM capability at increased data rates (currently 4800 baud) to deployed submarines. The SSIXS UHF SATCOM broadcasts are formed by SSIXS computer operators at each of the four BCAs or their designated alternates. The SSIXS computer is also used to assemble the FVLF/LF broadcast, which is relayed to ISABPS for storage and transmission via the FVLF/LF transmitters. The SSIXS broadcast information is forwarded to the appropriate NCTAMS, which transmits, receives, and relays information via satellite communication. The system uses the Navy's UFO and FLTSAT satellites and will transition to an UHF DAMA capability as the total MILSATCOM architecture transitions.

22.3.5 Officer in Tactical Command Information Exchange System. OTCIXS provides OTH-T information through an UHF SATCOM channel to submarines at a data rate of 2400 baud. The OTCIXS data

is assembled at the submarine shore targeting terminals located at the submarine BCAs and then relayed to a supporting NCTAMS for transmission, as with SSIXS. The submarine OTCIXS net differs from the surface OTCIXS in one way. It is a protected broadcast (the BCA screens traffic, passing only essential information to the submarine), similar to the submarine SSIXS broadcast, while the surface OTCIXS net is not. In addition to OTH-T information, this link is also used to relay Tomahawk MDUs and TADIXS A information to submarines not currently equipped with TD-1271 DAMA modems. As with SSIXS, submarine OTCIXS will transition to UHF DAMA.

22.3.6 Tactical Digital Information Exchange Subsystem (TADIXS A and B). TADIXS A provides the Navy, via an UHF DAMA circuit, a 2400 bps link used for MDUs and other file transfers. Following installation of Mini-DAMA and upgrades to the ON-143(V)6 firmware, SSNs will be able to receive TADIXS A, providing commonality with the surface Navy. In the interim, SSNs equipped with the TD-1271 DAMA modem and KG-84A can receive TADIXS A information. TADIXS B supports near real-time relay of intelligence data and requires installation of the AN/USQ-101TRE, currently programmed for SSNs.

CHAPTER 23

Aircraft Communications

23.1 REFERENCES

Unless specifically exempted herein, all aircraft will follow the rules for communications by aircraft as prescribed in this publication and in the appropriate ACP or JANAP, as listed in Figure 23-1.

23.2 CONCEPT OF AIRCRAFT COMMUNICATIONS

Modern aircraft require speed and accuracy from the communication facilities through which they are controlled. Voice radio is the primary means of air control and frequencies are allocated for exclusive use by air operations.

Commanders of forces and units afloat are responsible for the safety and control of aircraft under their command and they normally provide the communications support. This support can vary from a standby single channel system when under EMCON to the provision of simultaneous HF, VHF, and UHF networks. For example, simultaneous networks would be required to support an AEW aircraft that is both controlling the combat air patrol and performing surveillance.

Requirements also depend on the number of aircraft airborne. For example, one or two aircraft may only require one channel for safety/control while numerous aircraft, involved in a major operation, may need many channels. Requirements are also determined by the ability to maintain circuit discipline and by visibility in the operations area.

23.3 AIRBORNE AIRCRAFT

During extended flights, aircraft radios will be set to the same frequencies as those of stations or ships guarding the flight. If it is necessary to communicate with other stations, these stations should be notified of the appropriate frequency in advance. During the flight, the aircraft will shift frequencies, as necessary, to maintain communications with the various control towers or stations en route.

The Fleet Tactical Circuit (277.8 MHz) is guarded by all U.S. ships underway. If air-to-surface frequencies have not been prearranged or if satisfactory contact cannot be gained, the aircraft shall attempt contact on this network, shifting to a working frequency once communications are established.

Aircraft that maintain radio communications with their bases, ships, or stations shall establish communications on a prearranged frequency within 5 minutes after takeoff unless specifically directed otherwise. The ship or base will keep a communications guard with the aircraft until it returns or until another ship or base assumes the guard. Local regulations will govern local flights and tower communications.

23.3.1 Flight To and From Surface Ships. Upon aircraft departure from a shore station or a ship, a message shall be transmitted to both the departure and destination ship or shore station by secure communications, where available. Where secure communications do not exist, or if speed is of the essence, flight information may be transmitted on nonsecure circuits, such as an HF air administration net, using numerical and joint operational codes to the maximum extent possible. The message text shall include the following:

1. Model designation of senior pilot's aircraft
2. Number of aircraft
3. Estimated or actual time of departure
4. Destination, approximate route from at least 50 miles off the coast, and estimated time of arrival
5. True airspeed
6. Radio call signs and any special requests.

The call sign of the originator is the point of departure and the action addressee's call sign is the point of immediate destination, unless special circumstances require another shore-based activity to take action on the report.

SUBJECT	REFERENCE	REMARKS
Voice Radio Procedures	NTP 5 SERIES	Naval telecommunications procedures — Voice communications
Tactical Air Networks	Appendix B	Appendix B has circuit nomenclature
Air Traffic Control Procedures	ICAO, FAA, and ACP 121 US SUPP-2	FAA 7110.65 “Air Traffic Control” is published and issued by the FAA “ANC Procedures for the Control of Air Traffic” is published by the FAA and issued by NAVOCEANO
Control Tower Frequencies	Flight Information Publications	FLIPs give normal hours of operation at Navy/Marine Corps air traffic control facilities and other data including radio aids to navigation.
Naval Air Activities	OPNAVINST series 2000, 2300, 3400, and 3700	General aeronautical information
Visual Signaling	ATP 1, Vols. I and II; ACP 136; NWP 3-04.1M, NAVAIR 00-80T-113; ACP 168	Maneuvering, display, and pyrotechnic signals between air/ground/surface units.
IFF	ACP 160 series	US SUPPs contain IFF Mk 10 and 12 information
Tactical Call Signs	ACP 110 USN SUPP	CW-type military calls for naval aircraft
Voice Call Signs	JANAP 119	
Brevity Codes	ACP 165, NATO SUPP to ACP 165	NATO SUPP to ACP 165 is of limited distribution for NATO use only
Flight Services	FAA Publication 7110.10	Part I is voice; Part II is RTT
Aviation Services	FCC Regulations Vol. V, Part 87	

Figure 23-1. References for Aircraft Communications

The action addressee will notify other interested commands in accordance with local regulations. During radio silence conditions on a ship, aircraft — if departing from the ship — will hold transmissions until they have removed themselves from the area of the afloat unit to such a degree that their transmissions will not compromise the location of the afloat unit.

23.3.2 Aircraft Message Reports. Aircraft departure, arrival, position, and weather reports may be sent via appropriate U.S. military, civil, or commercial communications systems. Since other agency or Allied communications systems are not obligated to handle aviation messages in military format, the naval pilot in command of the flight may alter the format, if necessary.

U.S. commercial procedures for handling military aircraft are explained in FAA Publication 7110.10, Flight Services, which can be obtained from GPO.

23.3.3 Tactical Air Navigation Aid. This system is literally a form of directional homing beacon for use by airborne aircraft as an aid to navigation. It may be installed on both surface ships or in fixed land stations. Tacan includes distance measuring equipment, which operates on UHF. A VHF counterpart is VOR, which may include distance measuring equipment.

Assignment authority for certain channels is vested in the Fleet CINCs, who have now delegated this responsibility to the JMFOs. Requests for channels should be submitted to the appropriate regional JMFO, information to the appropriate Fleet CINC. Tacan channel assignments for shipboard operation within 500 miles of Europe shall be made by CINCUSNAVEUR.

Tacan identifiers for ships are in ACP 113. Ships with tacan equipment that do not have permanent identifiers should submit requests to the appropriate command for assignment. See Chapter 26 regarding emergency weather reports to aircraft.

CHAPTER 24

Military Sealift Command Communications

24.1 OPERATIONAL COMMAND STRUCTURE AND RELATIONSHIPS

COMSC exercises day-to-day operational direction and management control over MSC forces through area commanders, each of whom is double-hatted as a commander of a Sealift task group. Area commanders and their respective task group designations are:

1. Pacific — CTG 18.1
2. Atlantic — CTG 48.1
3. Far East — CTG 73.7
4. European — CTG 63.7.

These area commanders exercise operational control and provide ship husbanding. MSCEUR and MSCFE also provide immediate priority repair for all MSC ships in their areas of responsibility. Area commanders will work with all MSC customers to help develop requirements and to provide on-site assistance, as required.

MSCO field activities provide liaison and support at locations where there is a need for continual on-site presence. Additional support for MSC operations is provided by cross-service representatives assigned to U.S. embassy staffs, DOD transportation officers, or civilian employees. The MSC shore organization is depicted in Figure 24-1.

The U.S. Transportation Command, located at Scott AFB, IL consolidates all DOD transportation requirements for JCS and administers the system. USTRANSCOM is a unified command with component commands from the Navy, Air Force, and Army. As such, USTRANSCOM directs the consolidated transportation forces necessary to support requirements of the warfighting CINCs. When supporting a CINC during exercise contingency operations, USTRANSCOM exercises operational control over the common user transportation assets of MSC, the Air Mobility Command, and the Military Traffic Management Command.

24.2 MSC FORCES

MSC works closely with the CINCs for sealift planning and operational functions. MSC forces are fully integrated into the operational structure of the Navy's major fleets and their subordinate numbered fleets worldwide. CINCs have operational control over all assigned military forces and are responsible for offloading and in-theater movement of personnel and material. The MSC force supporting this effort is divided into five functional programs:

1. Naval Fleet Auxiliary Force
2. Sealift Force
3. Prepositioning Force
4. Special Mission Support Force
5. Ready Reserve Force.

24.2.1 Naval Fleet Auxiliary Force. The NFAF program includes dedicated assets of the MSC that provide direct fleet support to Navy operations worldwide. NFAF ships provide underway replenishment for naval forces and are part of the combat logistics force. The NFAF is the most homogeneous of all MSC forces. All ships are U.S. Government owned with standardized communications and information system equipment that is interoperable with other naval forces. NFAF ships have considerable redundancy in communications capabilities. Shipboard management information system implementation, LAN installations, and computer workstation upgrades have improved user access and efficiency.

24.2.2 Sealift Force. The Sealift Force program provides marine transportation to the DOD by meeting its sealift requirements. It is the largest MSC force and relies heavily on mobilization to accomplish surge requirements. The Sealift Force provides transportation for nearly 95 percent of military resources required for sustained military operations. It delivers personnel,

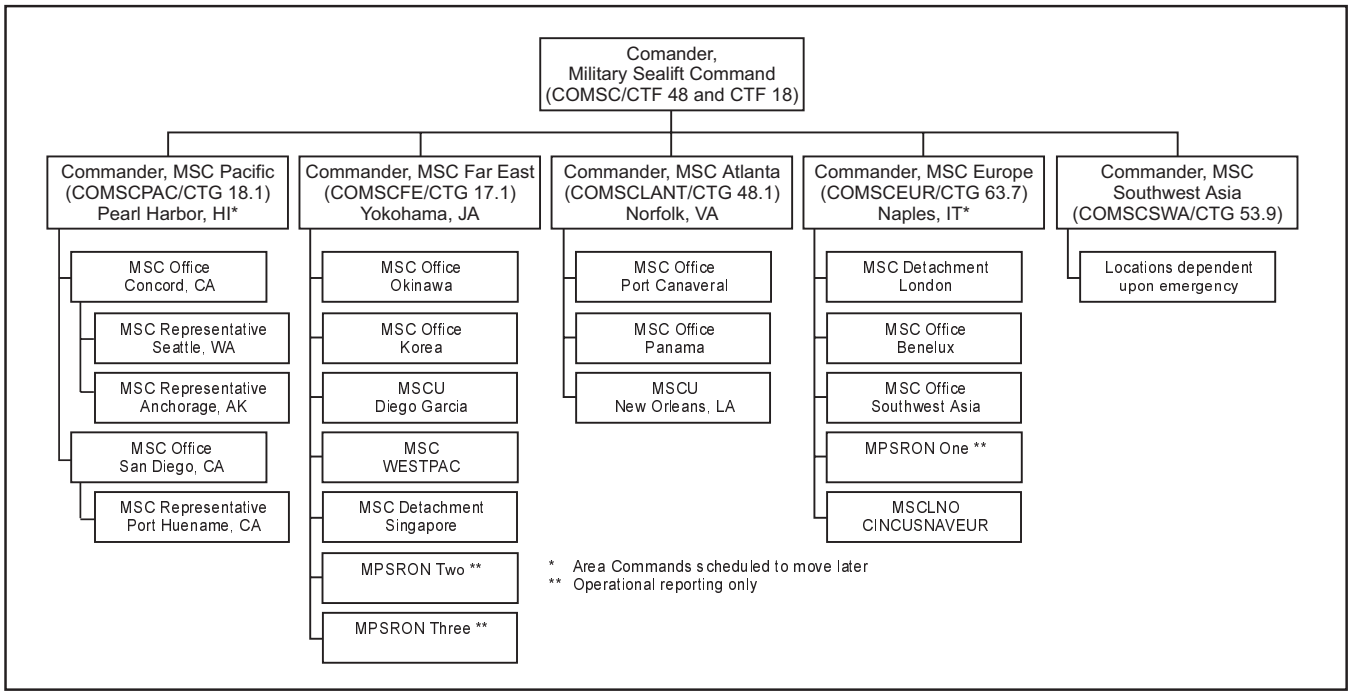

Figure 24-1. Military Sealift Command Organization and Locations

equipment, petroleum products, and other supplies and provides underway replenishment of NFAF ships. All ships have civilian crews. Communications and information services capabilities vary widely among the ships depending upon mission requirements.

24.2.3 Prepositioning Force. PREPO ships deliver urgently needed equipment and supplies during contingencies. PREPO ships are either Government owned or leased and contractor operated. PREPO crews are U.S. citizens and key personnel hold security clearances. Military detachments may be assigned to some ships for maintenance and inspection of embarked equipment. PREPO ships may be released by the operational commander to augment sustainment sealift requirements after the offload is completed. With the exception of flagship capable units, communications and information system suites vary considerably.There is limited capability for tactical communications with the Navy.

24.2.4 Special Mission Support Force. SMSF ships are the smallest component of MSC forces. SMSF ships conduct highly specialized missions, including surveillance, oceanographic research, missile tracking, and coastal surveying. They are U.S. Government owned and operated by Civil Service or contractor employed mariners. They often have military and civilian scientists and technicians onboard. They are equipped with mission specific communication and information system suites.

24.2.5 Ready Reserve Force. The RRF plays a key role in surge and sustainment operations. It consists of a fleet with both active and inactive ships maintained by the Maritime Administration. A varying number of RRF ships are active in the Prepositioning and Sealift Forces. RRF ships are maintained, activated, and operated by ship managers and generally located at U.S. Government reserve fleet sites or selected ports within CONUS. The level of maintenance manning is related to activation parameters.

Communication suite specifications are based on FCC, Coast Guard, and SOLAS criteria. There are no standard arrangements or specifications to meet MSC-unique requirements. However, upgrades and modernization programs are coordinated with MSC. User workstations, their location, and integration vary widely. There is a very limited capability to handle classified or sensitive information. Security clearance requirements for masters, mates, and radio officers are not uniformly specified.

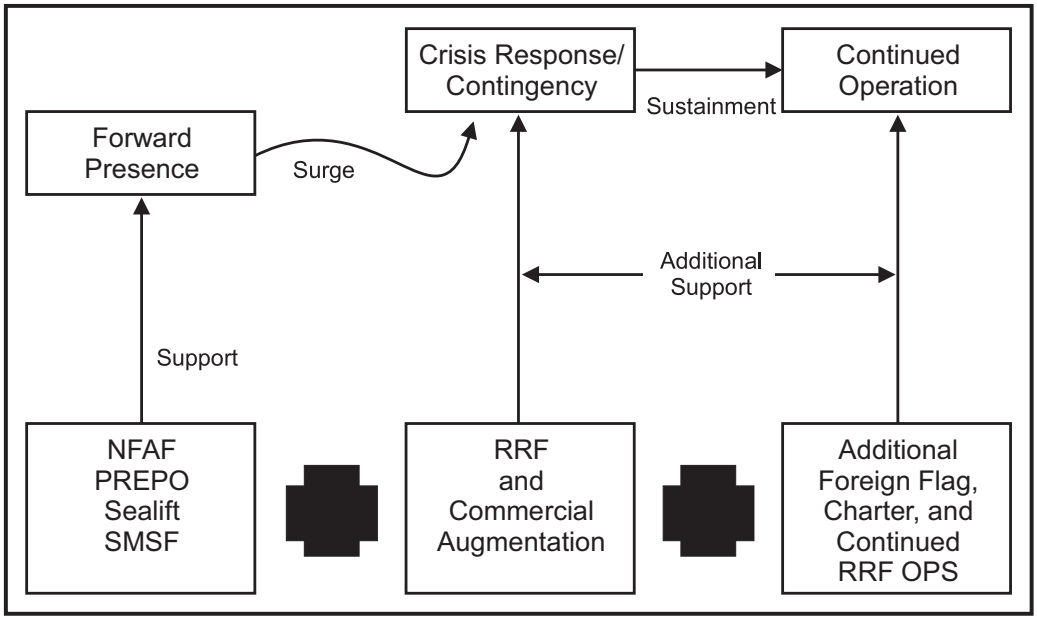

Figure 24-2. MSC Missions and Operational Relationships

24.3 MISSION SUPPORT REQUIREMENT

For the MSC shipboard operational user, ship-shore communication services must provide for rapid expansion and be reconfigurable and sustainable for all ship classes, including mobilization of the RRF.The shipboard user's operational environment is dynamic and can rapidly change on a continuum from normal peacetime operations to surge, crisis, contingency, and sustainment operations as illustrated in Figure 24-2.

24.3.1 Organization. Forward presence operations are maintained by:

1. NFAF support of deployed naval forces
2. Pre-positioning of equipment, supplies, and materials
3. Sealift resupply
4. SMSF surveillance and survey support.

Surge operations are supported by activation of fast sealift squadrons and RRF assets, as well as chartering commercial U.S. and foreign flag shipping for sealift augmentation.

Sustainment operations are supported by continued RRF activations and supplemental commercial charter of U.S. and foreign flag shipping assets.

MSC ship-shore communications policies and procedures must take into account the high level of force diversity within the MSC fleet. The MSC force consists of varying types of ships that are engaged in a wide variety of missions and impacted by numerous variables, as depicted in Figure 24-3.

24.3.2 Communication and Information Transfer Requirements. The basic framework for ship-shore information exchange and required interoperability was developed based on organizational relationships and operating environment. Tactical interoperability and connectivity requirements are defined as interactive and real- time information exchange that are needed for operational coordination where units are within line of sight or extended line-of-sight ranges.

With the exception of hospital ships that are prohibited by the Geneva Convention from encrypting information, all NFAF ships are required to handle both tactical and strategic classified information. PREPO ships have similar requirements. SMSF ships have tailored requirements for classified information and, depending on employment and sponsor requirements, may require capabilities above Secret.

The normal operational environment for MSC forces supporting forward presence and other peacetime support operations places little stress on the current commercial and military communications support systems. The majority of the RRF ship portion of the Sealift

MSC FORCE DIVERSITY VARIABLES
Ship's mission and who is the administrative and operational commander?
Ship's operational status prior to surge or mobilization, i.e.. full or reduced operational status (FOS/ROS) and activation period
Ship's communications capability and configuration and does it meet the operational requirements of the ship?
Ship's manning status, i.e., U.S. civilian mariner (CIVMAR), contract operated by U.S. shipping company or by foreign nationals?
Ship's ownership, i.e., U.S. Government owned or commercially owned?
Ship's tactical communication requirements?
Ship's interoperability requirements, i.e., who does ship need to communication with?
Ship's secure/sensitive communications requirements?
Ship's status in complying with GMDSS requirements?
Ship's commercial services utilization?

Figure 24-3. MSC Diversity Summary

Force is normally in a reduced operational status where no demands are made on ship/shore information services. Routine point-to-point lift operations of active Sealift Force ships place modest demands on commercial ship-shore services. PREPO ships, although forward deployed, are normally underway only for scheduled brief training periods and offload teams are not usually embarked.

The most stressing and challenging operational environment for the existing MSC communications support system is in support of surge operations that result from crisis response or mobilization demands. During these operations, the Sealift Force undergoes major expansion. The Sealift Force may increase four- to tenfold through activation of RRF ships and the subsequent increase in use of chartered ships, including foreign flag units. PREPO ships will become active and embark augmentation teams that may include up to a 100 personnel, plus support element and debarkation team personnel. The tempo of operations of NFAF ships will increase. With the possible exception of the T-AGOS surveillance ships, surge operations have little or no impact on SMSF ships.

24.3.3 Planning Aids. Experience from recent contingency operations and exercises is a primary driver in formulating a viable strategy that will be used to develop overall policy and meet MSC ship-shore communications requirements in the future. This recent experience indicates that:

1. Merchant ship reliance on 50-baud TELEX communications is not feasible during high-tempo operations in the information age. While it may be adequate during normal peacetime operations, speed of service and reliability standards cannot possibly be met when message traffic levels increase by a thousand percent or more. In addition to high traffic levels in terms of message counts, information volume itself is much higher today than even 10 years ago because of technological advances in PC computing, data processing, and information transfer techniques. This continuing increase requires a much larger pipeline than that available with TELEX.

2. INMARSAT voice and TELEX traffic contend with each other for access to INMARSAT, which

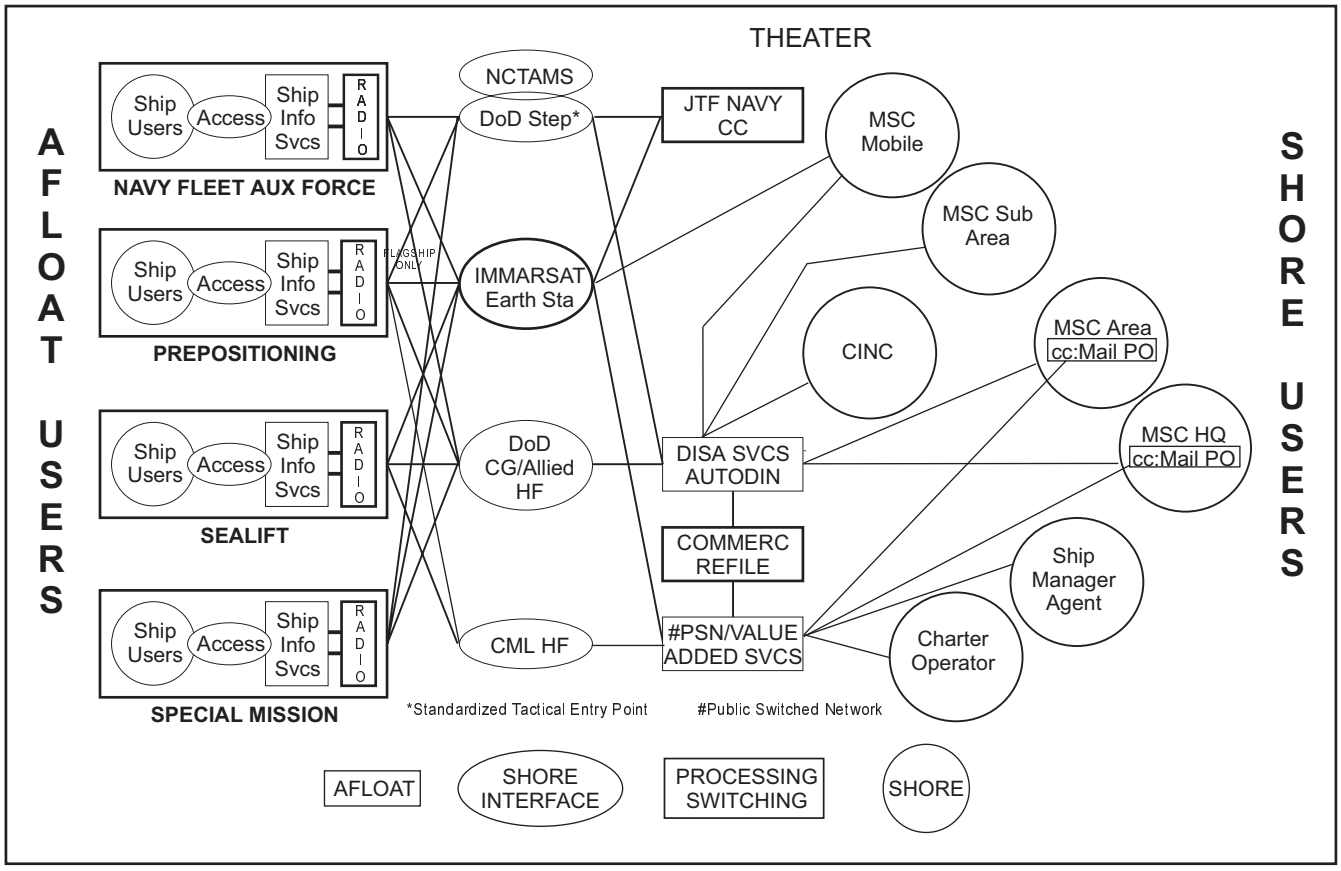

Figure 24-4. Simplified MSC Ship-Shore Communications Interconnect

further exacerbates the TELEX problem. This type of problem is particularly prevalent in high-profile operations where flag staff, members of the press, or other interested parties may be on board.

3. Upon becoming a part of a task force containing U.S. Navy fleet units, MSC merchant ships are quickly inundated by very long, multi-sectional, messages containing information that has no intrinsic value to the merchant ship. The TELEX costs associated with this are also significant, as each section to each ship is a separate TELEX transaction.

4. Reporting requirements must be consolidated and report formats standardized to reduce messaging levels and workload associated with reporting.

24.4 CURRENT MSC COMMUNICATIONS ARCHITECTURE

A simplified depiction of the current communication support system is shown in Figure 24-4. The simplified interconnect shown is for messaging service only. Other communication services supported by this system are summarized in Figure 24-5. The ability to protect classified or Sensitive But Unclassified information for any of these services varies widely by MSC force, ship class, and transmission media utilized.

Teletype and TELEX are the most widely interoperable service, primarily via INMARSAT, with HF radio as a secondary means. Additionally:

1. Voice, primarily via INMARSAT, is available to all MSC ships and often interoperable with other units.

MSC Force	TRANSMISSION SYSTEMS						USER INTERFACE AND SERVICES											
	UHF SATCOM	INMARSAT	HF	SITOR	UHF	VHF	CUDIXS TTY	STACOM BCST	TELEX	CC:MAIL	FAX	STU III	S/S VOX	TACTICAL VOX	SECTAC VOX	PC STA	LAN	SMIS
Naval Fleet Auxiliary Force																		
T-AE	X	X	X		X	X	X	X		X	X	X	X	X	X	X	X	X
T-AO	X	X	X		X	X	X	X		X	X	X	X	X	X	X	X	X
T-AFS	X	X	X		X	X	X	X		X	X	X	X	X	X	X	X	X
T-ATF	X	X	X		X	X	X	X		X	X	X	X	X	X	X	X	X
T-AH	X	X	X		X	X	X	X		X	X		X	X		X	X	X
Prepositioning Force																		
MPS	X*	X	X	X	X	X	X*	X*	X	X	X	X	X	X	X*	X		
T-AVB		X	X	X		X			X		X	X	X	X		X		
APR/WR		X	X	X		X			X				X					
T-ACS/AOT%		X	X	X		X			X				X	X				
Sealift Force																		
FSS		X	X	X		X			X				X					
Tanker		X	X	X		X			X				X					
Cargo		X	X	X		X			X				X					
Foreign Flag		X	X	X		X			X				X					
Special Mission Support Force																		
T-AGOS	#		X		X	X	X			X	X	X	X	X	X	X	X	X
Other	X	X	X		X	X	+			X	X	X	X			X		

% - OPDS configured * - Flagships only # - SHF + - Specialized data links

Figure 24-5. MSC Force and Type Versus Communication Services Capability

2. Facsimile, primarily via INMARSAT, is available to many MSC ships.

3. E-mail, using cc:Mail® primarily via INMARSAT, is available to selected MSC ships.

4. Data services, with limited interoperability, are available to selected MSC ships.

NFAF, MPSRON flagships, and SMSF ships that have access to DOD STEP satellite services have classified communication services available to them and utilize INMARSAT as a secondary transmission media. They also have ready access to other DISA backbone services, such as the AUTODIN and, in time, DMS.

For non-flagship MPSRON, other PREPO ships, and Sealift Force ships, primary access is to the Public Switched Network, usually via INMARSAT. The current interface to DOD DISA services and to military users is via commercial refile. This Navy-operated activity provides message addressing and reformatting services to facilitate the flow of TELEX traffic into the AUTODIN messaging system. It also provides reverse refile for traffic flowing from AUTODIN to nonmilitary department ships.

24.5 FORWARD PRESENCE OPERATIONS

For non-flagship PREPO ships and Sealift Force ships, interoperability is achieved primarily through TELEX service via INMARSAT. As shown in Figure 24-4, ships in these forces connect to DOD users through a single interface at the commercial refile activity. The entire TELEX process is manpower intensive and ship-shore service costs are high.

The requirements for classified and SBU information handling can be met by NFAF, SMSF, and MPSRON flag-configured ships. However, the ability to protect SBU information or the capability to handle classified information is very limited, in general, within the Sealift Force and is limited within the non-flag configured portion of the Prepositioning Force.

Required ship-shore movement of files and other information formats are met for NFAF ships via cc:Mail® over INMARSAT. Some PREPO ships have a cc:Mail® capability. This service is not currently secure.

24.6 SURGE OPERATIONS

The current MSC ship-shore service interconnect configuration for teletype and TELEX information exchange is shown in Figure 24-4 and is highly stressed during surge operations. The commercial refile center becomes a critical and potentially overloaded interface between military and commercial communication systems for non-flag ships. The problem is compounded by the activation of RRF ships where, in a major activation, radio officers qualified and experienced in DOD-related communication policy and procedures are in short supply.

The requirement for information protection increases in surge or mobilization related operations. For Sealift Force ships, particularly those activated from the Ready Reserve Force, both the availability of cleared personnel and lack of security equipment severely limits the ability to protect SBU or classified information.

24.7 SELECTED TACTICAL COMMUNICATION CAPABILITY

Three types of tactical information exchange capabilities may be required for MSC force ships:

1. JMCIS oriented information via the OTCIXS. This tactical information display provides situation awareness, ship locations, and related tactical information needed to facilitate underway replenishment operations. This information is classified and is in data format.

2. Tactical voice utilized for tactical coordination in connection with underway maneuvering, coordination, and helicopter control during formation steaming and underway replenishment operations. These include secure UHF LOS tactical voice networks included in the JTF/TF Communications Plan for the combat force being serviced.

3. LOS voice communications required for interactive coordination of units, both afloat and ashore, within the local MSC force operating area. These would include (joint) logistics-over-the-shore operations within the shore port of debarkation area. In many operational situations, a requirement exists to protect this information.

Combined, joint and naval operational commanders must use a unique mixture of DOD and commercially provided communications services to task, control, and support assigned MSC units. Wide variances exist in the user interfaces, ship-shore transmission systems, and the shore accesses used by MSC forces. Significant variances also exist within ship types, particularly on Sealift Force and SMSF ships.

24.8 CURRENT MSC SHIP-SHORE COMMUNICATION METHODOLOGIES

Current MSC communication initiatives encourage reducing TELEX traffic to short, high precedence messages while increasing cc:Mail® use to more efficiently and affordably meet ship-shore information exchange requirements. MSC initiatives to introduce wider use of cc:Mail®, shipboard LAN implementation, and SMIS promise shipboard user workload reduction and manning realignment through information system automation and movement of some support functions ashore. INMARSAT is the primary MSC force-wide method for ship-shore access. HF radios are available as a second resource.

This 50-baud, 66-wpm, labor intensive, and high cost-per-unit of information service has long been the backbone for both merchant and MSC ship-shore information transfer. Service is available worldwide via INMARSAT or HF radio but it is for unclassified traffic only. TELEX is the de-facto lowest common denominator, most interoperable telecommunications service currently available to the full range of MSC users. The current commercial refile center is located at NCTS San Diego, CA.

INMARSAT is the primary ship-shore service provider for MSC. Currently INMARSAT terminals are found on all MSC ships, regardless of force. The same is true of U.S. Navy combatants, Allied navies, and merchant shipping worldwide. INMARSAT services are available from a number of different sources around the world. However, for DOD and U.S. Government use, DITCO has negotiated for special rates with COMSAT World Systems.

GMDSS requirements and operation are detailed in DMAH/TC Publication 117, Radio Navigational Aids, and in Chapter 11 of this document. GMDSS capabilities will be implemented in all MSC ships by the required 1999 deadline. As the primary system for safety and environmental information service, GMDSS system components, such as the Standard C and DSC VHF or MF/HF, can also be used for handling operational and administrative information.

CHAPTER 25

Fleet Marine Force Communications

25.1 FMF ROLE IN THE 21ST CENTURY FORCE STRUCTURE

With the new direction of the Navy and Marine Corps team defined as one of providing the nation naval expeditionary forces, shaped for joint operations, tailored for national needs, and operating "Forward, From the Sea," the role of the Fleet Marine Force has undergone significant change. As the landward extension of the NEF, Marine forces significantly magnify their power and influence and are central to the littoral strategy.

25.2 MARINE AIR-GROUND TASK FORCE

The MAGTF is the organizational entity through which Marine forces are tailored to meet specific operational requirements. Established by law to be "forces of combined arms, together with supporting air components," MAGTFs are expeditionary, rapidly expandable air-ground formations, capable of operating from sea bases, ashore, or both, simultaneously. The MAGTF can range in size from small special purpose units to large Marine expeditionary forces. Regardless of size, however, each MAGTF will be self-sustaining, rapidly deployable, and be comprised of a command element, a ground combat element, an aviation combat element, and a combat service support element.

25.3 AMPHIBIOUS READY GROUP/MARINE EXPEDITIONARY UNIT

The ARG/MEU (SOC) is a national military asset that routinely deploys forward in support of National Military Strategy objectives. Organic capabilities are sufficient to execute taskings in the event of war. The peacetime mission of the ARG/MEU (SOC) is to conduct forward presence operations to help shape the strategic environment, provide deterrence, guide joint and multinational interoperability, and respond, as necessary, to fast-breaking international crises with either the application of combat power or the threat of its use. The basic elements comprising an ARG/MEU (SOC) include the amphibious squadron command and staff, ARG shipping, MEU (SOC), naval special warfare (SEAL) detachment, and beach group detachment. An ARG/MEU (SOC) deploying with elements other than these will be designated "ARG/MEU (SOC) plus" or "minus" as are CVBGs.

25.4 REFERENCE DOCUMENTATION

As the redefined role of Navy and Marine forces continues to evolve, the USMC is reevaluating and rewriting their communication requirements to best meet the unique challenges presented by the emphasis on expeditionary and joint operations. FMFM 3-30, which deals specifically with FMF communications, is undergoing major revision and will be republished as MCWP 6-22. It will be the defining document for FMF communications requirements in the various operational scenarios dictated by today's doctrinal and strategic guidance. Other sources of information pertaining to FMF basic operational communications doctrine include:

1. NWP 1-00M, Role of USMC in National Defense
2. NWP 3-19M (Series), MAGTF Operations
3. NWP 3-57M, MAGTF Civil Affairs
4. Joint Pub 3-02.1, Joint Doctrine for Landing Force Operations
5. Joint Pub 3-02.2, Joint Doctrine for Amphibious Embarkation.
6. Joint Pub 6-06.2, Joint Tactics, Techniques, and Procedures (JTTP) for Single Channel Ground and Airborne Radio System (SINCGARS)
7. CJCSM 6231 Series.

25.5 SINGLE CHANNEL GROUND AND AIRBORNE RADIO SYSTEM

Regardless of the nature of FMF tasking, SINCGARS will play a major role in providing necessary operational communications support. SINCGARS is a family of lightweight combat radios. Developed as a Joint program, SINCGARS is the standard VHF-FM tactical radio used in most all battle area environments. SINCGARS provides the backbone for the single channel radio net that is used by all C^2 and fire support systems. It provides high security against surveillance and jamming by using frequency hopping with integrated communications security. SINCGARS is capable of voice and data transmission over the VHF-FM frequency range of 30 to 87.975 MHz.

CHAPTER 26

Environmental Communications

26.1 POLICY AND DESCRIPTION

To provide commanders with requisite knowledge of environmental conditions, a complex communications system is required to augment regular, common-user systems. The system must provide facilities for collection and relay of highly perishable environmental observations, as well as rapid dissemination of environmental warnings, analyses, forecasts, and advisories of conditions that may affect the tactical situation, mission accomplishment, or protection of life and property.

Commanders will provide resources as required to observe and transmit environmental observations as specified in paragraph 26.1.1 and will further ensure compliance with guard requirements for receipt of environmental information, as set forth in paragraph 26.4.2.

26.1.1 Details. Navy and MSC ships shall observe environmental conditions and report in accordance with the U.S. Navy Meteorological and Oceanographic Support Manual, NAVMETOCCOMINST 3140.1 (series), promulgated by Commander, Naval Meteorology and Oceanography Command, Bay St. Louis, MS. Criteria for the periodicity of reporting different types of required environmental data, addressing instructions, and code formats for weather messages are also contained in NAVMETOCCOMINST 3140.1. Responsibilities and procedures for the observation and reporting of bathythermograph data are contained in OPNAVINST 3160.9.

26.1.2 Message Classification. National policy, as promulgated by the JCS, states that environmental information is unclassified. However, some messages containing environmental observations may require classification to protect a ship's position or movement. Classified environmental reports may normally be downgraded to unclassified after 10 days from the day the environmental information was compiled. See OPNAVINST 5510.1 series for guidance on downgrading and declassifying messages. See paragraph 26.6 regarding meteorological control procedures and paragraph 17.2.2.8 for FOUO guidelines.

26.1.3 Message Precedence and Call Signs. The precedence assigned to environmental reports shall normally be Priority. Messages will be assigned Immediate precedence when any of the following conditions exist:

1. Wind speeds in excess of 33 knots
2. Sea state of 12 feet or greater
3. Moderate or heavy precipitation
4. Visibility less than 1 mile
5. Pressure change of 3 millibars or greater within the past 3 hours
6. Oceanographic observations as dictated by current operations
7. Volcanic activity producing volcanic ash.

In the case of tropical storms, typhoons, or hurricanes believed to be previously undetected, unit commanders may use Flash message precedence for reporting, provided there are no extenuating circumstances that would jeopardize the tactical situation.

International radio call signs shall be used for the originator of environmental messages, including those prepared in international weather codes that are not transmitted on line.

26.2 TRANSMISSION OF ENVIRONMENTAL INFORMATION

Classified and unclassified environmental reports shall be transmitted on line when facilities are available. Environmental messages are encoded in standard codes for brevity. Operating forces transmit encoded observations in message format to appropriate environmental AIGs on general ship-to-shore circuits in accordance with NAVMETOCCOMINST 3140.1 (series). Similarly, designated shore activities transmit required

reports to collection centers via existing communications circuits. Naval meteorology and oceanography centers, facilities, and detachments exchange environmental information through the DISN and various dedicated circuits.

Reconnaissance aircraft normally transmit observed environmental data to a designated reconnaissance monitor by voice or radio teletype using assigned air-to-ground frequencies. Further relay of data is accomplished by rapid dissemination to analysis centers. Procedures are closely coordinated between the Navy and Air Force using joint facilities in certain locations.

26.2.1 Transmission of Environmental Messages Under Minimize Conditions. Imposition of Minimize requires unit commanders and commanding officers to exercise stringent controls on communications transmitted electronically. Criteria for message transmission during Minimize include traffic that must be transmitted in order for the command or activity concerned to avoid a serious detrimental impact on mission accomplishment or safety of life. Some types of environmental data messages fall within the criteria stated above. These types include, but are not limited to, the following:

1. Small craft, thunderstorm, gale, storm, hurricane, typhoon, and high seas warning.

2. Tropical disturbance advisory.

3. Weather en route forecast (WEAX) messages when any of the conditions listed in paragraph 26.1.3 are forecast. WEAX is also transmitted during Minimize when in support of weather sensitive operations such as towing, salvage, or diving operations.

4. Optimum track ship routing (OTSR) support.

5. ASW forecasts dictated by the operational situation.

6. Ice forecasts dictated by the operational situation.

7. Radiological fallout when DEFCON 1 or 2 is set.

8. Routine OPAREA forecasts when any of the conditions in paragraph 26.1.3 are forecast.

26.2.2 Weather and Oceanographic Observations When Observed Parameters Reflect Significant Weather. When significant weather is anticipated, the following observations are required:

1. All normal 6-hour period synoptic weather observations

2. Oceanographic observations as dictated by the operational situation.

26.3 COMMUNICATIONS DURING RADIO SILENCE

During normal weather conditions, ships, patrol aircraft, or long-range aircraft observing radio silence may be required to use radios to transmit an encrypted message, except initial enemy contact reports. In such cases, they will append a weather report if:

1. The message will not be unduly delayed thereby.

2. The message already contains the position of the reporting ship or aircraft.

3. The reporting ship or aircraft is reasonably certain that the position is known within 30 miles by the addressee who is responsible for forwarding the weather data.

No more than one appended report need be made in any 6-hour period by a ship or 3-hour period by an aircraft, unless a substantial or unexpected change in environmental conditions occurs, and even not then if it is known that another ship or aircraft in company has made a report.

During typhoon or hurricane conditions, tactical units and ships encountering unmistakable signs of a previously unreported tropical storm, typhoon, or hurricane may, at the commander's discretion, break radio silence and report weather conditions by Immediate precedence message to the OTC, the force commander, and fleet commander, if appropriate. The cognizant NAVMETOCCEN shall also be an action addressee. See paragraph 26.1.3 regarding the use of Flash precedence. Submarines en route to or from or actively on patrol station shall break radio silence for reporting unmistakable signs of a previously unreported tropical storm, typhoon, or hurricane only when directed by the submarine operational commander or higher authority. When directing a submarine to break radio silence for this purpose, it must be considered probable that the submarine's position will be revealed. When time and circumstances permit, submarines shall include environmental observations in every message transmitted while on patrol.

Aircraft should be guided by instructions from their bases regarding when to break radio silence to report operationally significant weather.

26.4 ENVIRONMENTAL PRODUCTS ON FLEET BROADCAST

NAVMETOCCOMINST 3130.1 (series) describes in detail the various environmental products available on fleet broadcasts . Further, this manual sets forth procedures for requesting additional environmental support required for fleet operations.

Briefly, designated NAVMETOCCENs:

1. Compile and key fleet multipurpose environmental radio facsimile broadcasts

2. Compile and key the meteorological channel of the FLTBCST, usually carried in Channel 8

3. Compile environmental forecasts, warnings, and advisories for inclusion on common-user channels of the FLTBCST.

Types of broadcasts and areas covered by each NAVMETOCCEN are dictated by communications resources available in the respective NCTAMS areas. Details of environmental broadcast schedules and frequencies are promulgated in the Worldwide Marine Radiofacsimile Broadcast Schedules, NAVAIR 50-IP-1P-11, and ACP 174, NATO SUPP-2.

26.4.1 Other Environmental Broadcasts. A number of non-Navy weather broadcasts exist throughout the world, transmitting in CW, RATT, and RAFAX modes. These broadcasts are a source of environmental information, including ice warnings, which complement fleet broadcasts originated by NAVMETOCCENs. In some cases, these broadcasts offer more timely and detailed information for their specific areas than available on fleet broadcasts. Details concerning call signs, frequencies, modes of emission, geographic area coverage, and schedules are promulgated in the Worldwide Marine Radiofacsimile Broadcast Schedule and NAVAIR 50-1P-11.

26.4.2 Guard Requirements. Ships and forward bases with environmental forecasting personnel attached shall copy appropriate environmental broadcasts. When these requirements cannot be met because of communications equipment limitations, other communication resources shall be provided by appropriate authority.The Worldwide Marine Radiofacsimile Broadcast and NAVAIR 50-1P-11 contain RAFAX and RATT schedules to be consulted when fleet broadcasts cannot be copied. This will ensure receipt of minimum essential information. More extensive copying of fleet environmental broadcasts will be dictated by command or operational requirements.

Ships and advanced bases without environmental forecasting units attached have no direct requirements to copy environmental RATT or RAFAX broadcasts other than as may be dictated by command. Warnings, advisories, and forecasts are routinely disseminated to these operating elements via fleet broadcast and/or common user communications circuits.

26.5 ENVIRONMENTAL SATELLITES

Selected ships and deployed COMNAVMETOCCOM elements are equipped with receivers and ground terminal equipment that enable them to receive satellite imagery directly from orbiting environmental satellites. Guard assignments are promulgated by cognizant authority to meet specific operational requirements.

Paragraph 16.1.5.2, subparagraph 12 provides information on TESS(3)/NITES, a computer-based system and terminal used to integrate and transmit environmental data received from environmental satellites and other sources to battle group units and major shore installations with meteorological centers.

26.6 METEOROLOGICAL CONTROL

METCON is a procedure by which unclassified weather and oceanographic information is afforded a degree of control and protection in the interest of national security but not assigned a security classification. The JCS will determine when and in what areas METCON procedures will be implemented and, once set, there will normally be no relaxation without JCS approval. However, a responsible military commander may temporarily relax all or part of the METCON procedures because of operational necessity. If time permits, prior approval of the JCS will be obtained; if not, the action will be reported to the JCS as soon as possible. The JCS, the commanders of numbered/specified commands, and the commanders of Allied commands are responsible for the temporary relaxation of METCON procedures. Coordination with appropriate authorities of Allied nations on matters pertaining to this policy will be accomplished by JCS.

26.6.1 Control of METCON Information. The minimum controls specified herein are considered mandatory and commanders have the prerogative of recommending more rigorous controls to the JCS. However, if the imposition of more rigorous controls by a commander will not affect other commands, they may be imposed without reference to JCS.

Weather information that affects military interests, except when related to a classified subject, will be afforded such protection as can reasonably be expected to deny it to unauthorized persons for a period of 10 days following the valid time of the data. Random loss of small amounts of weather information to an enemy will not aid him significantly; therefore, adherence to rigid controls on weather data minutia is unnecessary. Interception of a large quantity of weather information by an enemy can also be accepted when the place of interception is such as to prohibit delivery to a place where the enemy can effectively use it.

The United States should not impose protective measures for weather information in any area outside the United States and its territories, except in ocean areas, unless all nations in that area agree to provide similar protection for weather information that they produce or receive. Therefore, directives to implement this policy must specify the geographic areas in which protective measures will be taken.

26.6.2 Transmission of METCON Information in CONUS. All METCON information to be transmitted electronically in CONUS will be encrypted except:

1. That transmitted over landlines and microwave relay circuits.

2. Scheduled broadcast of existing en route or terminal weather over low-powered aeronautical navigation facilities, with a range of 200 miles or less, if not susceptible to routine interception beyond coastal boundaries.

3. Unscheduled transmissions to aircraft of existing and forecast, not to exceed 2 hours, en route or terminal weather over short-range voice facilities, with a range of 200 miles or less, for reasons of aircraft safety. Broadcasts will be limited to the minimum information required for the safe conduct of flying operations.

4. Scheduled transmissions of essential meteorological data over low-power radio, with a range of 200 miles or less, if not susceptible to routine interception beyond coastal boundaries. Unscheduled transmissions containing essential data may be sent in clear text over low-powered radios susceptible to such reception only when use of other communications media is not practical.

26.6.3 Release of METCON Information. METCON information will be released only to agencies that have a valid operational need and provide proper protection. Release to non-U.S. agencies will be made on the basis of reciprocal agreements for adequate protection of the information. Recipients who may be authorized access to METCON meteorological and oceanographic information are the military and other U.S. Government agencies and private enterprises serving the national defense effort.

Limited quantities of METCON information on existing forecast conditions in the United States and its possessions may be issued to the public. This will include only that information necessary to make the content intelligible and useful and will not make reference to current analysis or prognostic charts. In case of severe weather conditions, the warning will include all information essential for the protection of life and property.

CHAPTER 27

Harbor Communications

27.1 HARBOR COMMUNICATIONS

Harbor communications and coordination of harbor and base communication requirements are the direct responsibility of the Senior Officer Present Afloat, whose authority shall extend to all inport ships and those other afloat units present, except those craft under the direct control of the base commander. Area commanders may issue modifications of SOPA instructions as necessary to meet the requirements of bases under their command.

Ships will guard the Fleet Tactical net on 277.8 MHz UHF LOS for emergency and other operational traffic as directed by the SOPA. This network will not be used for administrative traffic. For call signs used in U.S-controlled or foreign ports, see the appropriate regional CEI.

27.2 U.S. NAVY SHIP COMMUNICATIONS IN FOREIGN PORTS

U.S. Navy ships, less submarines, entering and leaving foreign ports will guard the port operations channel for bridge-to-bridge operations specified by the local harbor authorities. This circuit is used for communications with harbor stations, pilot boats, merchant vessels, or other U.S. Navy ships, as required. In U.S. Navy controlled ports, a specific guard channel should be established by port control authorities, in coordination with foreign port authorities, giving due consideration to the presence of foreign naval ships and merchant vessels operating in or near the approaches of that port. When practicable, all U.S. Navy ships should guard the same channel.

Because many countries require frequency clearance actions before ships are allowed to transmit, U.S. Navy ships that intend to visit foreign ports should consult the various CEIs and operations plans and orders applicable to their operating region for information regarding frequency usage well in advance. Commanding officers may request information pertaining to communication facilities and frequency usage in foreign ports, when not otherwise available, via their Port Clearance Request message, as outlined in OPNAVINST 3128.3 series, or via the LOGREQ message. See paragraph 16.1.8.2.1.1 regarding use of INMARSAT in foreign ports.

27.3 FOREIGN MEN-OF-WAR IN U.S. PORTS AND TERRITORIAL WATERS

As a general rule, foreign men-of-war shall be allowed to communicate between themselves and with their own governments in privacy and using their own codes, if desired. They shall, however, observe the radio restrictions for the area in which they are operating. Naval commanders may withhold this privilege within their area of responsibility if it is deemed necessary for military reasons, informing CNO (N3/N6) as soon as practicable of such restrictions and providing the justification for invoking them.

Friendly men-of-war visiting in U.S. ports in time of peace normally shall be granted permission to use their radio transmitters on any frequency requested, on a not-to-interfere basis with existing U.S. requirements, provided the frequency is one authorized by international agreement. Authority to grant this permission is vested in the commander sponsoring the visit. Clearance for the use of frequencies should be completed at the time initial visiting arrangements are being made, should cover the entire period of the visit, and should be applicable to all U.S. ports to be visited. The commander granting permission to visiting units to use their radio transmitters under the provisions herein shall advise CNO (N61) of any frequency authorized.

In the event prior arrangements are not possible, the SOPA should request that the cognizant Fleet CINC temporarily grant necessary permission(s) upon the arrival of the visiting units and while authority is sought through normal channels, keeping CNO (N61) advised.

Part VII — Warfare Mission Applications

CHAPTER 28

Warfare Mission Applications

28.1 AMPHIBIOUS WARFARE

The concept of an amphibious operation as a primary means of warfare was developed during the 1930s and has been under continual refinement since that time. Today's amphibious communicator is faced with several documents to master prior to the preparation of the communication plan for one of the most complex military operations in which naval forces participate. Further compounding the complexity of amphibious operations is the present-day emphasis on joint conduct of these evolutions, as delineated in "From the Sea" and "Forward From the Sea."

The complexity of an amphibious operation is most clearly reflected in the intricate communications system required to support it. Communications, electronic and visual, are the primary means of unifying the effort of the complex forces involved. The communications plan must adhere to the basic principles of accuracy, brevity, and clarity in presenting unit requirements.

28.1.1 Reference Documentation. The following documents provide pertinent policy and operational guidance regarding communications planning and execution to support all phases of amphibious operations.

1. NWP 5-00.3M, Amphibious Task Force Planning
2. NWP 3-02.50, Amphibious Ships Tactical Manuals
3. NWP 3-06M, Riverine Operations
4. NWP 3-05, Naval Special Warfare
5. NWP 3-05.2M, SEAL Operations
6. NWP 5-01, Naval Operational Planning
7. FMFM 3-30, USMC Communications
8. Joint Pub 3-02 (Series), Joint Doctrine for Amphibious Operations
9. Joint Pub 3-05 (Series), Doctrine for Joint Special Operations.

The majority of these documents reference other documents that should be consulted if additional information is required.

28.1.2 Planning and Execution. Initial planning for an amphibious operation commences with the initiating directive. The initiating directive is generally issued by the commander who is the common superior to all forces assigned; it contains the concept of operations, forces assigned, and lists the desired objectives. At that point, the staffs supporting the CATF and the CLF will write their respective OPORDs, with close coordination between staffs. Frequencies to support all phases of the operation will be allocated and frequency assignments will be coordinated.

28.1.3 Marine Corps Communications Detachments. Certain ships may have a permanent Marine COMMDET assigned to the ship in support of amphibious operations and to handle troop communications requirements. When not involved in direct support of amphibious operations, COMMDET personnel are integrated into the normal communications watchstanding organization while others maintain the spaces and equipment allocated to the CLF, when embarked.

28.1.4 Rehearsal. Rehearsals are normally conducted prior to any operation, one purpose being to test and evaluate the total communications system developed and activated for the operation. Equipment and networks should be tested before the fact. Communications for the rehearsal are the same as for the actual operation subject to any restrictions prescribed by the CATF. The rehearsal normally is the last opportunity for testing the communication plan. Any changes must be closely coordinated.

28.1.5 Movement to the Objective. During this phase of the amphibious operation, final preparations for the assault phase are made. If amphibious reconnaissance missions are to be supported, the

communication plan must reflect the requirements to support these critical evolutions. Training for the final phases of the operation should also be held during this period.

28.1.6 Assault Phases. In anticipation of heavy message traffic loading, intra-task force communications circuits should be activated to the maximum extent possible. Smaller, less capable units may require relief from certain circuit guard requirements to ensure they are up and active on circuits critical to their role in the assault operations. Additionally, there will be significant airborne communications requirements with troop and cargo handling helicopters, as well as fixed-wing assets.

As the landing force moves to the beach and establishes its communications capabilities, selected circuits and the control of those circuits should be shifted ashore. Additional circuits to support land-based operations will be activated, as required.

28.1.7 Advanced Base. As the advanced base is established, shift of communications circuits and systems will proceed at a rapid pace. This phase is characterized by a shift from primary reliance on radio circuits to reliance on wireline and multichannel radios. During this phase, it may be necessary to augment ashore personnel. Decisions to do so are at the discretion of the landing force commander.

28.1.8 Riverine Operations. Riverine operations are those necessary to achieve and maintain control of a waterway system and its contiguous areas for the purpose of denying use to the enemy. The operations include those that emanate from or that are conducted on, across, or along the waterway system and that combine the characteristics of ground, naval, and air operations. River operations, essentially but not exclusively waterborne, are used to gain/maintain control of a waterway as a logistical line or to deny such use to the enemy.

Environmental and topographical effects, which are not experienced at sea, strongly influence communications capabilities during riverine and related operations. These could include geographic obstructions to LOS communications, high temperature/humidity that reduces life of batteries, thick vegetation and wet grass that absorbs transmitted energy, and so forth. Accordingly, correct methods of operation and use of established procedures are essential for effective communications.

Pertinent documents cited in paragraph 28.1.1 should be referenced for additional information.

28.2 UNDERSEA WARFARE

The mission of USW is to provide defense against enemy submarines. During the Cold-War period, USW was continuously refined in response to the requirement to locate, identify, and track submarines, particularly those of the former Soviet Union fleet.

Today, although there is no longer a significant Soviet submarine threat, the danger to the battle group posed by hostile attack submarines is still considered one of the most serious problems of naval warfare. This threat continues to grow as submarines become quieter and display greater stealth capabilities.

28.2.1 Reference Documentation. The following documents provide pertinent policy and operational guidance regarding communications planning and execution in support of USW operations.

1. NWP 3-21.1, Undersea Warfare Commander's Manual
2. NWP 3-21.2, Submarine Approach and Attack Manual
3. NWP 3-21.3, Surface Ship Undersea Warfare (ASW) Principles
4. NWP 3-21.6, Air USW Supplement
5. NWP 3-21.66, S-3B Tactical Manual.

28.2.2 Area USW Elements. Area USW necessitates maintaining the overall USW picture within the assigned area of operations. Area coordination of USW efforts includes the management of several elements used to gather and process reports and information.

28.2.1.1 Integrated Undersea Surveillance System. IUSS combines the SOSUS network and towed array T-AGOS ships. Each ship can relay acoustic data collected by the towed array via the DSCS network back to a central processing station.

28.2.1.2 Long-Range Maritime Patrol Aircraft (S-3, P-3, etc.). Information gained from the IUSS and other sources is forwarded to MPA for close surveillance.

28.2.1.3 Submarines. Submarines are the best platforms to track other submarines because of their quietness and ability to stay on station in the same environmental medium — under water. Submarines are assigned operating areas by the submarine type

commander or SUBOPAUTH in coordination with IUSS and MPA resources.

28.2.1.4 Surface Towed Array Sensor System. SURTASS equipped cruisers, destroyers, and frigates operating independently provide additional threat input.

28.2.3 Battle Group/Force USW. In order to move a CVBG, ARG, or JTG across an ocean area, it must be protected from hostile action by submarines. Several resources, including fixed-wing aircraft, helicopters, surface ships, and submarines, using a variety of sensors are employed to provide USW support to the group.

When a battle group is in contested areas it must counter threats within a 500 nm range. In these situations, three zones — outer, middle, and inner — are established to accomplish USW defense of the group. Shore-based area USW and submarines provide information pertaining to threats in the outer defense zone. The middle defense zone is covered by destroyers and helicopters with their sensors and USW weapons. The inner zone is protected by the group's inner defense weapons.

28.2.3.1 USW Communications. Extensive coordination is required to effectively control the various USW elements used within and between the defensive zones. The communications circuits used to provide that coordination are listed in Figure 28-1.

The Fleet CINC provides overall theater situation information to the battle group via OTCIXS. Supporting shore-based MPA establish direct communications with the battle group and also have an indirect link through the TSC.

HF	Link 11, Task Group Command, VP Broadcast, VP Air-Ground, VP Shore Hop
UHF	Link 4A, Link 16, USW Aircraft Control, USW Contact and Report
UHF SATCOM	Fleet Broadcast, SSIXS, OTCIXS, BGIXS, CUDIXS, TACINTEL, DAMA, TADIXS
SHF SATCOM	Secure Voice, IUSS
EHF SATCOM	IUSS

Figure 28-1. USW Connectivity

SSNs provide outer defense against enemy submarines. Submarine connectivity is accomplished with SSIXS, BGIXS, OTCIXS, TADIXS, and EHF, but can also include HF and underwater acoustic communications.

SURTASS ships provide for middle defense and connect to the battle group via SHF SATCOM to a shore-based acoustic processing facility that analyzes the data being provided and sends pertinent information to the battle group. SURTASS ships can also establish a direct link to the battle group using HF or other available communications systems. Other escort ships within the battle group can also take part in USW missions, communicating with the battle group via Link 11 and other shipboard communications systems.

LAMPS helicopters are key elements of USW missions. LAMPS helicopters can deploy both active and passive sonobuoys to detect, classify, and track enemy submarines. Their connectivity with the battle group is via UHF LOS circuits and Link 11. Carrier-based S-3 aircraft round out the airborne capabilities of USW operations. They communicate to the battle group with UHF and VHF LOS, Link 4A, and Link 11.

28.3 AIR WARFARE

In basic terms, AW consists of countering air attacks against naval forces using all resources available. During the Cold-War period following World War II, fleet AW evolved into a highly centralized and communications intensive structure. The fundamental requirement was to be able to repel an attack, but not to stumble into a war. This dictated task and warfare organizations that were tightly controlled by senior commanders. Today, however, the challenge is different and the job of defending a battle group is more difficult. The numbers and deployment capabilities of potential enemies have increased. The threat no longer includes just enemy combat aircraft, but also sea-launched and air-launched cruise missiles and long-range, shore-based bombers. These factors, coupled with increasingly sophisticated opposing C2W capabilities, impose a heavy load on battle group AW command and control systems.

28.3.1 Reference Documentation. The following documents provide pertinent policy and operational guidance regarding communications planning and execution in support of AW operations.

1. NWP 3-01.01, Air Warfare

2. NWP 3-01.10, Air Warfare Commander's Manual

3. NWP 3-01.12, Surface Ship Air Warfare Tactics

4. NWP 3-01.20, F-14 Tactical Manuals.

28.3.2 AW Concepts and Principles. AW is difficult, highly complex, and time critical. As a result, it is usually characterized by tension and urgency. Therefore, personnel who plan, practice, and execute AW must understand basic AW concepts. These concepts are:

1. AW phases — Planning and advance preparation, surveillance area management, and engagement

2. AW control — Centralized control and decentralized execution

3. AW area — Vital area, AW destruction area, and AW surveillance area

4. AW zones — Outer defense zone, inner defense zone, and self-defense zone

5. AW axis — A true bearing from the center of the vital area used as a reference axis for stationing units.

In addition to basic AW concepts, several other operational principles have evolved to assist the battle group commander in coping with the complex and difficult problems inherent in AW. The most important of these principles are defense in depth, early warning, ROE, SEW, EMCON, and OPDEC. These terms are defined in the reference material provided in paragraph 28.3.1.

28.3.3 AW Communications. Command, control, and communications provide coordination within and between the defensive zones. The communications circuits used to provide that coordination are listed in Figure 28-2.

HF	Link 11, Task Group Command
UHF	Link 4A, Link 11, Link 16, Fighter Aircraft Control, AW Command Net, EW Contact and Report, USW Aircraft Control, SUW Contact and Report, SUW Aircraft Control
UHF SATCOM	Fleet Broadcast, OTCIXS, CUDIXS, TACINTEL, DAMA, TADIXS-B, TIBS
SHF SATCOM	Secure Voice, JDISS

Figure 28-2. AW Connectivity

28.4 SURFACE WARFARE

The function of SUW is the defense of a battle group from surface combatants. As a result of recent technological advances, SUW has grown increasingly complex and demanding. Development of ASCMs has provided the world's capital navies with long-range capabilities that approach the effective ranges of tactical aircraft. Furthermore, smaller, third world navies have developed or purchased short- to medium-range ASCMs that also provide them with a formidable surface threat. Countering these threats requires extensive planning, careful execution of search and attack plans, and coordinated use of all battle group SUW assets.

28.4.1 Reference Documentation. The following documents provide pertinent policy and operational guidance regarding communications planning and execution in support of ASUW operations.

1. NWP 3-20, Naval Surface Warfare

2. NWP 3-20.1, Surface Warfare Commander's Manual

3. NWP 3-20.2, Surface Ship Tactical Employment in Naval Warfare

4. NWP 3-20.21, Battle Group Surface Warfare Tactics

5. NWP 3-20.22, Surface Warfare Aviation Tactics

6. NWP 3-20.30, Surface Ship Tactical Manuals

7. NWP 3-20.45, Surface Ship Survivability

8. NWP 3-20.46, Surface Ship Surface Warfare Tactics

9. NWP 3-20.47, Surface Ship Over-The-Horizon Targeting (OTHT) Systems and Tactics

10. NWP 3-20.49, Submarine Strike and Antiship Missile Employment Manual

11. NWP 3-20.5, P-3 Tactical Manual.

28.4.2 SUW Communications. SUW controls various strike assets, including ship-launched missiles, battle group aircraft, and attack submarines assigned to support the battle group. Information flow to and from these assets is essential to effective SUW operations.

Situational information and data are provided to SUW via several communications circuits including tactical data links, UHF SATCOM information exchange subsystems, and SHF SATCOM circuits. The communications circuits used to provide coordination for ASUW are listed in Figure 28-3.

28.5 STRIKE WARFARE

Strike warfare is the conduct of offensive operations by a battle group against enemy forces afloat and ashore. STW is normally supported by the battle staff and air wing from their tactical flag command center on board an aircraft carrier. The STW system focuses on accepting information from various sources and distributing this information to appropriate elements of the battle group. Information exchanged includes battle group launch plot data, order of battle and targeting data, ELINT data, tactical air mission planning data, airborne ECM planning data, and Tomahawk planning data.

28.5.1 Reference Documentation. The following documents provide pertinent policy and operational guidance regarding communications planning and execution in support of strike warfare.

1. NWP 3-03, Strike Warfare
2. NWP 3-03.1, Tomahawk Land Attack Missile (TLAM-C/D) Employment Manual
3. NWP 3-03.2, Tomahawk Land Attack Missile (TLAM) Launch Platform and Weapons Systems Tactics
4. NWP 3-03.4, Tactical Air Strike Operations Against Land Targets
5. NWP 3-03.41, A-6 Tactical Manuals
6. NWP 3-03.42, F/A-18 Tactical Manuals.

28.5.2 STW Communications. Effective STW coordination requires that appropriate information be passed to and within the battle group to permit proper planning and execution of the strike. The communications circuits used to provide that coordination are listed in Figure 28-4.

HF	Link 11, Strike, Task Group Command
UHF	Link 4A, Link 16, SUW Aircraft Control, SUW Contact and Report, Fighter Aircraft Direction, EW Contact and Report
UHF SATCOM	Fleet Broadcast, SSIXS, OTCIXS, BGIXS, CUDIXS, TACINTEL, TADIXS, TRE
SHF SATCOM	Secure Voice, JDISS, CTAPS

Figure 28-3. SUW Connectivity

HF	Link 11, Task Group Command
UHF	Link 4A, Link 11, Link 16, Fighter Aircraft Control, EW Contact and Report, AW Command, AW Report, USW Aircraft Control, SUW Aircraft Control
UHF SATCOM	Fleet Broadcast, SSIXS, OTCIXS, BGIXS, CUDIXS, TACINTEL, TADIXS, TRE
SHF SATCOM	Secure Voice, JDISS, CTAPS
EHF SATCOM	Mission Data Updates, Strike Coordination Net

Figure 28-4. STW Connectivity

28.6 COMPOSITE AND JOINT OPERATIONS

As dramatic changes took place in the nature of the world geopolitical profile, so changed United States national security policy and mission area definition for the Armed Services. The Navy and Marine Corps strategy statement "From the Sea" and amplified with updates - titled "Joint Operations" and "Forward From the Sea" redefined the mission of the Navy and Marine Corps as one of providing the nation naval expeditionary forces, shaped for joint operations, operating forward from the sea, and tailored for national needs.

It was recognized early on that no single military service embodies all the capabilities needed to respond to every situation and threat that could be posed to our national security. Hence, the ever increasing emphasis

on joint and composite operations, ensuring that the individual services can operate jointly and successfully in all warfare areas and across the spectrum of anticipated mission profiles — in times of peace, crisis, regional conflict, and restoration of peace.

The conduct of joint operations involves four distinct phases. They are:

1. Predeployment
2. Deployment
3. Employment
4. Redeployment.

28.6.1 Reference Documentation. Each phase of joint and composite operations has its own unique communications support requirements. To become familiar with these requirements, the following reference documentation should be consulted.

1. CJCSM 6231 Series — Manual for Employing Joint Communications Systems Joint Tactical Systems Management
2. Joint Pub 3-02 (Series), Joint Doctrine for Amphibious Operations
3. Joint Pub 3-05 (Series), Doctrine for Joint Special Operations
4. Joint Pub 6-02.3, Joint Communication-Electronic Operational Instructions
5. Joint Pub 6-02.5 Joint Key Management System
6. Joint Pub 6-04 (Series), U.S. Message Text Formats (USMTF).

This partial listing of pertinent publications refers to other, equally informative documents with additional governing guidance on the conduct of joint and composite operations and the communications requirements inherent to those operations. Although this section provides an overview of joint communications concepts and responsibilities, additional, more comprehensive guidance is provided in the referenced documents.

28.6.2 Operations and Force Composition in the Joint Environment. Present-day naval response to a crisis demonstrates the new emphasis on the regional, littoral, and expeditionary nature of mission execution. Navy leadership will make available to the unified commander a notional expeditionary force from among the following assets:

1. Aircraft carrier and air wing
2. Submarines
3. Amphibious ships with embarked Marines
4. Surface combatants
5. Mine warfare forces
6. Navy special warfare forces.

These forces will then be available to the unified commander for tasking in the full range of joint operations with the other services.

The naval components of the expeditionary force will operate with other elements of joint and combined task forces, including:

1. Air Force composite wing
2. Army infantry, airborne, or air mobile forces
3. Special operations forces
4. Surveillance, refueling, air defense assets
5. Coast Guard assets
6. Reserve forces in contributory support
7. Allied forces and assets.

The key to the success of these joint operations is continuously tailoring our forces to anticipate and support national needs. This tailoring includes the communications capabilities and connectivity required to ensure mission success.

28.6.3 Employment of Joint Tactical Communications. As indicated in the listing of references, the CJCSM 6231 (series) manual contains definitive guidelines relating to communications concepts and responsibilities in the joint arena. The manual is broken down as follows:

1. CJCSM 6231.01, Joint Tactical Communications Systems Management
2. CJCSM 6231.02, Joint Voice Communications Systems

3. CJCSM 6231.03, Joint Data Communications

4. CJCSM 6231.04, Joint Transmission Systems

5. CJCSM 6231.05, Joint Communications Security

6. CJCSM 6231.051, Joint Communications Security (Classified Supplement)

7. CJCSM 6231.06, Joint Technical Control Procedures/Systems 8. CJCSM 6231.07, Joint Network Management and Control.

28.6.4 Joint Communications Concepts and Responsibilities. Figure 28-5 shows the composition of a generic JTF with its component structure. Specific responsibilities for Navy and Marine Corps forces are described below.

28.6.4.1 Commander, Naval Forces. COMNAVFOR is responsible for:

1. Ensuring that personnel and equipment are available aboard ship to meet the ship-to-shore requirements as defined in the JCP

2. Ensuring that naval special operations forces are equipped with switching, terminal, and transmission equipment that meet the NAVSOF requirements identified in the JCP and tasking OPORDs

3. Ensuring that the NAVSOF provides base and post support to the JCSE and Service or Allied components that have communications terminals or facilities at the NAVSOF HQ

4. Providing management information to the JCCC as required

5. Providing the communications resources required to install, operate, and maintain other portions of the joint communications system as directed by the supported CINC.

28.6.4.2 Commander, Marine Corps Forces. COMMARFOR is responsible for:

1. Ensuring that personnel and equipment are available to the MARFOR HQ to provide the switching, control, terminations, facsimile, and services identified in the JCP

2. The installation, operation, and maintenance of the MARFOR communications equipment and links required to support the JCP

3. Ensuring that base and post support are provided to the JCSE and Service or Allied components that have communications terminals or facilities at the MARFOR HQ

4. Providing management information to the JCCC as required

5. Providing the communications resources required to install, operate, and maintain other portions of

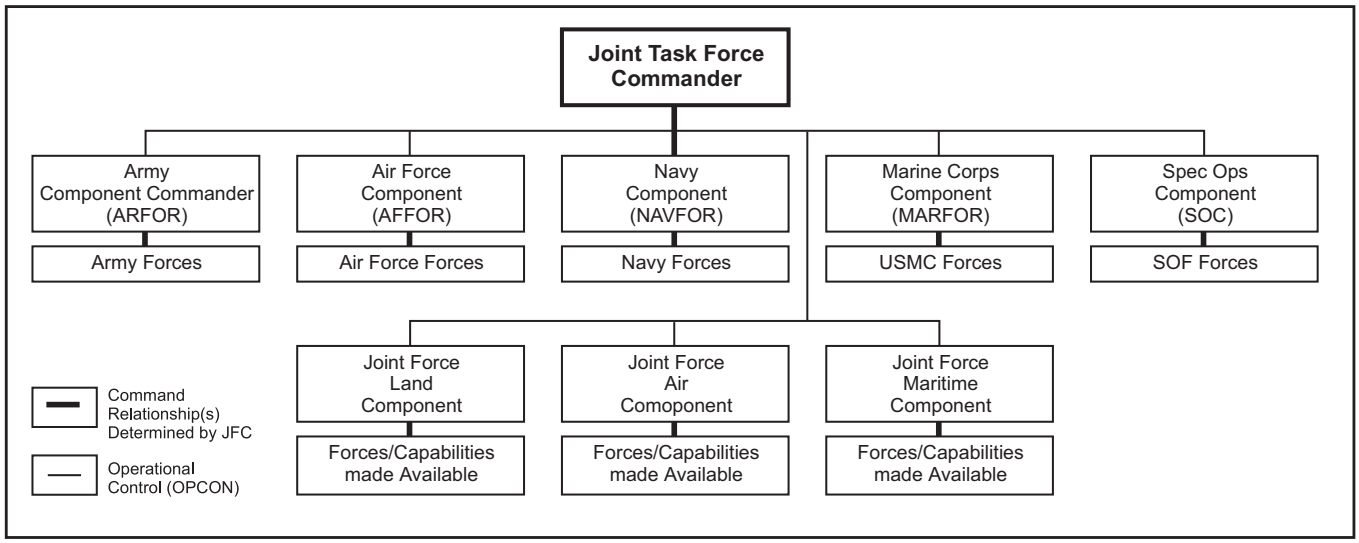

Figure 28-5. Generic Joint Task Force Component Structure

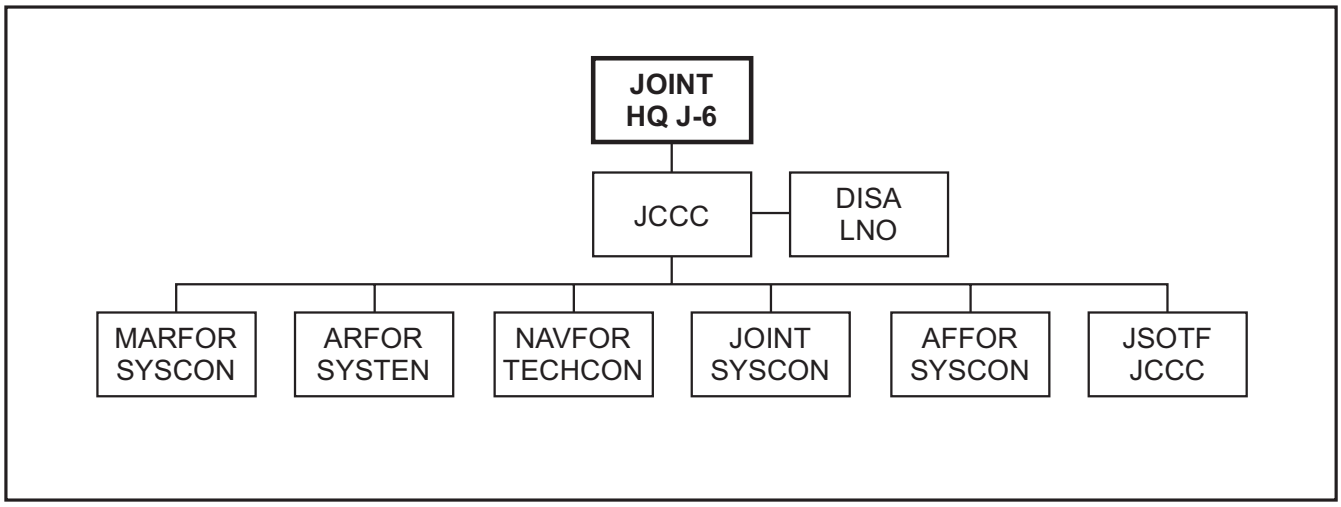

Figure 28-6. Joint Communications Support Infrastructure

the joint communications system as directed by the support CINC.

28.6.5 Joint Communications Management. Successful system integration and operation of diverse communications systems in a joint environment requires that strict technical and management standards be imposed on those networks and their users. Figure 28-6 shows the relationships between the various control entities in a joint environment.

Joint communications management provides for centralized control with decentralized execution. It exercises dynamic technical control over theater communications systems and coordinates required interfaces with the DISN and other combatant or specified command communications systems.

28.7 LAW ENFORCEMENT OPERATIONS

In the Fiscal Year 1989 Defense Authorization Act, Congress mandated DOD involvement in the war on drugs. Accordingly, the U.S. Navy, in recent years, has been involved in supporting the drug interdiction effort mounted by the Department of Justice through the DEA. However, because of the Posse Comitatus Act passed in 1878, which precludes the use of the military in carrying out law enforcement operations and which was not reversed by the 1989 Congressional mandate, the Navy's role in drug intervention is limited to detection, monitoring, and technical intelligence gathering (i.e., radio transmission, imagery, etc.). The Navy's usual role involves the use of ships, maritime patrol, and airborne radar aircraft operating in an integrated network with assets from other services and federal agencies. Coast Guard teams operate from Navy ships to board, search, and, if necessary, seize vessels smuggling narcotics and make arrests, which the military are not authorized to do. Joint Pub 3-07.4, Joint Tactics, Techniques, and Procedures (JTTP) for Counter-Drug Operations, provides additional information regarding the actions and methods employed for law enforcement operations relating to drug interdiction and involving Navy or other military assets. The Joint Publication also describes how forces will be employed and the doctrine for the conduct of these operations.

28.7.1 Anti-Drug Network. ADNET is a secure information network (GENSER Secret) that allows rapid transfer and sharing of drug-related detection and monitoring data between units of DOD, USCG, Federal law enforcement agencies, the Intelligence community, Royal Canadian Mounted Police, and the Canadian National Defence Headquarters.

ADNET consists of high-performance workstations running a core set of COTS and GOTS software packages connected, for the most part, by routers to the SIPRNET. OTCIXS gateways exist at USCGPAC and Joint Inter-Agency Task Force East that permit afloat connectivity. Specific responsibility for ADNET program execution is held by DISA Counter-Drug Division

(D64). Detection and monitoring responsibility is assigned to the appropriate unified commander.

28.7.2 Law Enforcement Operations in Connection with Power Projection. Within the context of the redefined mission for the U.S. Navy and Marine Corps, as delineated in "From the Sea" and "Forward From the Sea," the use of joint expeditionary forces to respond to civil unrest in areas where United States interests exist take on the attributes of law enforcement operations efforts. However, unique law enforcement operations communication assets and doctrine, such as those associated with ADNET, would not apply to these operations. Joint or Navy specific operational communications doctrine (i.e., JTF, JSOTF, ARG, etc.) and procedures would apply.

Part VIII — Communications and Operational Security

CHAPTER 29

Communications Security

29.1 DEFINITIONS

Communications security refers to procedures, processes, and those items designed to secure or authenticate telecommunications and the transfer of information. COMSEC includes keying materials, equipment, documents, devices, firmware, and software that embodies or describes cryptographic logic and other items that perform or provide COMSEC functions. The Communications Security Material System Manual (CMS 1) promulgates rules, regulations, and guidance concerning the distribution, transmission, use, handling, accountability, security, control, and disposition of material distributed through the COMSEC Material System.

Signal security is a generic term that includes both COMSEC and ELSEC. Information concerning SIGSEC is contained in NWP 3-13.1 and information concerning ELSEC is contained in NWP 3-51.1. See Figure 29-1 for a definition of basic COMSEC terms.

29.2 IMPORTANCE OF COMSEC

The only complete defense against hostile exploitation of communications is radio silence. Operational considerations usually render this infeasible. The achievement and maintenance of a high state of communications security is the responsibility of all commanders and it is an indispensable element of successful naval operations. COMSEC provides that required security.

29.3 COMSEC POLICY

In order to improve naval communications security and reduce the vulnerability of communications to exploitation, U. S. Navy policy dictates that all tactical communications should be encrypted. Tactical communications, as defined in OPNAVINST 2000.15, are those elements of naval communications normally provided by the organic assets of naval tactical forces in support of assigned tactical missions and can include voice, record, data, facsimile, video, and acoustic forms of communications. Deviation from the above policy may be authorized when crucial to combat situations, when provided for in critical intelligence situations, in situations involving safety, and when required by Allied or Joint directives or international agreement.

29.4 RESPONSIBILITY FOR COMSEC

COMSEC is a command responsibility and extends to every commander having cognizance over communications.

Each command should have a dynamic COMSEC program that includes training on COMSEC matters, recurring review of command practices, and implementation of remedial action to correct any shortcomings noted. Help is available to assist in identifying and correcting COMSEC deficiencies through various COMSEC reports and CMS assist visits. See Figure 29-2. COMSEC training visits, in particular, are a valuable tool for evaluating COMSEC practices and procedures, especially unit CMS readiness, and are required every 18 months.

29.4.1 CMS Incident Reports. These reports are issued when violations of CMS procedures are discovered.

TERM	DEFINITION
CRYPTO SECURITY	The component of communications security which results from the provision of technically sound cryptosystems and their proper use.
TRANSMISSION SECURITY	The component of communications security which results from all measures designed to protect transmissions from intercept and exploitation by means other than cryptoanalysis.
EMISSION SECURITY	That component of communications security which results from all measures taken to deny unauthorized persons information of value that might be derived from intercept and analysis of compromising emanations from telecommunications systems.
PHYSICAL SECURITY	The component of communication security which results from all physical measures thereto or observation thereof by unauthorized persons.
OPERATIONAL SECURITY	The component of communication security which results from all measures taken to protect sensitive information which might be derived from unclassified sources.

Figure 29-1. COMSEC Terminology

CMS ASSISTANCE	DEFINITION
CMS Advise & Assistance Program	An informal visit to a command to provide on-the-spot advice and guidance to communications and non-communications personnel who handle CMS material. Emphasis is placed on identification and correction of nonsecure COMSEC practices and procedures. Required every 18 months, visits may be conducted more often at the discretion of the commanding officer. CMS 1 refers. COMNAVCOMTELCOM CMS Advise and Assistance (A & A) Teams conduct liaison on all CMS matters as appropriate. Commands are urged to avail themselves of the technical knowledge and experience of these personnel. The same personnel are available, on request, to conduct training lectures and provide guidance on CMS matters.

Figure 29-2. COMSEC Assistance

CHAPTER 30

Operational Security

30.1 DEFINITION

Operational Security is defined as a systematic process by which the U.S. Government can deny to potential adversaries information about capabilities and intentions. OPSEC is performed by identifying, controlling, and protecting generally unclassified evidence of the planning and execution of sensitive government activities. For the scope of this publication, OPSEC is performed by COMSEC surveillance and monitoring.

30.2 COMSEC ANALYSIS REPORTS

These reports are promulgated to commands specified by the Fleet CINCs, COMNAVSECGRU, and CNO. Recipient commands shall disseminate the reports as required within the command. These reports summarize information that could have been obtained from naval communication systems because of poor COMSEC practices, in order that commanders may assess the impact of such loss on command operations, initiate corrective measures and identify communication circuits (including I-DSN) requiring additional security.

30.3 COMSEC SURVEILLANCE AND MONITORING

The national COMSEC instruction, NACSI 4000, establishes mandatory guidelines for conducting COMSEC surveillance activities and defines COMSEC surveillance and monitoring.

30.3.1 COMSEC Surveillance. COMSEC surveillance is the systematic examination of telecommunications to determine the adequacy of COMSEC measures, identify COMSEC deficiencies, provide data from which to predict the effectiveness of proposed COMSEC measures, and confirm the adequacy of such measures after implementation.

30.3.2 COMSEC Monitoring. COMSEC monitoring is the act of listening to, copying, or recording transmissions and data of one's own official telecommunications and automated information systems to provide material for analysis in order to determine the degree of security being provided to those transmissions and data processes. It is one of the techniques of COMSEC surveillance.

OPNAVINST 2305.14 series contains guidance on COMSEC monitoring requests, resources, and tasking directives. All U.S. Government personnel and all personnel with access to U.S. Government-furnished communications must be notified by regulation or directive that U.S. Government communications systems and facilities are subject to COMSEC monitoring and that use of the official communications system constitutes consent to COMSEC monitoring.

Prior to initiating COMSEC monitoring, the monitoring organization must obtain approval for the monitoring from a responsible senior official, such as the Fleet CINC for fleet units, FMF for USMC elements, or COMNAVSECGRU for all other naval activities, of the department or agency to be monitored. A determination must also be obtained from the general counsel of the department, agency, or component to be monitored that sufficient notice has been given within the organization that use of official communication systems constitutes consent to COMSEC monitoring.

U.S. Government communication systems or facilities as used herein, are considered to be DON tactical, nontactical, encrypted, and unencrypted circuits, as well as common user DOD telephone systems. However, pay telephones, telephones routinely used by the press, and telephones in individual and private residences and intended for private use are not subject to COMSEC monitoring.

All naval activities shall comply with actions delineated below regarding notification of COMSEC monitoring.

30.3.3 General Notification. Use the following statement in appropriate directives and for briefings.

"Telecommunications systems or facilities of the U.S. Government are subject to communications security (COMSEC) monitoring at all times. The use of these official communication systems by an individual constitutes his/her consent to COMSEC monitoring."

30.3.4 Common User DOD Telephones. Ensure the following information is prominently displayed on the covers of all official USN and USMC command telephone directories.

"Do not discuss or pass classified information over nonsecure telephone lines. DOD telephones are subject to monitoring for communications security purposes at all times. DOD telephones are provided for the transmission of official government information only and are subject to COMSEC monitoring at all times. Use of official DOD telephones constitutes consent to communications security monitoring in accordance with current regulation."

In addition to the telephone directory notice, further notify users of official DOD telephones and telephone systems that discussion of classified information over nonsecure circuits is prohibited, that official DOD telephones and telephone systems are subject to COMSEC telephone monitoring at all times, and that use of such telephones and telephone systems constitutes consent to COMSEC monitoring. Additional forms of notification include, but are not limited to the following:

1. Written notification and consent of individual users

2. At least two of the following: decals attached to the telephone (DOD Form 2056), POD notices, notices placed on bulletin boards or near telephones, initial briefing of new personnel and periodic re-briefing, and periodic special memorandums from commanders and commanding officers to telephone users.

Since all radio transmissions are susceptible to enemy direction finding and interception, officers in command shall exercise positive control of all radio facilities under their cognizance, taking particular care at advanced/overseas bases and staging points. Equipment calibrated to emit on VHF and above bands, remembering that reception over distances can occur, should be used in preference to HF and below bands. If HF communications are essential, LRI transmission methods can be used on AN/URT-23 transmitters with a HF modification kit to limit and control power output to reduce skywave and long-range propagation.

Similarly, the use of flashing light or other easily intercepted plain language visual systems must be restricted to areas where interception is unlikely. During darkness, the use of infrared signaling equipment is preferred. The OTC may prescribe visual silence when appropriate. Underwater sound communications are nonsecure and must be carefully controlled.

Part IX — U.S. Navy and Marine Corps Frequency Management

CHAPTER 31

U.S. Navy and Marine Corps Frequency Management

31.1 SPECTRUM CERTIFICATION

Spectrum certification is one of many steps that must be taken to obtain an authorization to develop or procure telecommunication equipment for operation in a given radio frequency band or bands. It is national and DOD policy that funds shall not be obligated for development and/or procurement of telecommunications equipment until spectrum certification authority has been obtained. Spectrum certification authority must be obtained from CNO (N61F) prior to moving from one phase of the system/equipment acquisition cycle to the next. Failure to apply the certification process on a timely basis can make obtaining frequency support difficult. It can also result in denial of spectrum support, undesirable limitations on desired support, or in costly system redesign with resultant waste of time and funding.

For the above reasons, radio spectrum certifications must be approved by CNO (N61F) prior to the development and procurement of Navy and Marine Corps communications-electronics equipment that will radiate and/or receive electromagnetic energy, i.e., Hertzian waves.

31.2 FREQUENCY ASSIGNMENT

IRAC obtains authority from DOC/NTIA for use of radio frequencies by U. S. Government agencies within the United States and its possessions. IRAC authority by itself, however, does not constitute authority for actual frequency use by Navy and Marine Corps forces and activities. Navy and Marine Corps users must also request specific frequency assignments from appropriate military authorities before actual use.

COMNAVCOMTELCOM, through NAVEMSCEN, develops and promulgates technical guidance and direction for radio frequency assignment matters to DON. NAVEMSCEN is a third echelon activity under the command of COMNAVCOMTELCOM. Within the parameters of the IRAC frequency allocation process, NAVEMSCEN assigns all radio frequencies for Navy and Marine Corps activities in CONUS. Assignments for use outside CONUS are made in accordance with ACP-190 US SUPP-1. NAVEMSCEN also assigns certain frequencies to naval area frequency coordinators, usually located at the Fleet CINC location, who, after coordination with NAVEMSCEN, may further assign these frequencies to area Navy and Marine Corps activities with short-term frequency requirements.

The frequencies assigned by NAVEMSCEN are used for operation of Navy and Marine Corps communications-electronic equipment physically located on Navy and Marine Corps installations or on installations belonging to other Services and also for communications-electronic operations of joint or shared facilities on Navy and Marine Corps installations (e.g., a joint communications center or a Navy or FAA facility). NAVEMSCEN normally does not obtain frequencies in support of other military or nonmilitary tenants on Navy and Marine Corps shore-based installations unless the activities are shared or jointly operated with those agencies.

Unified commanders make frequency assignments in their areas of responsibility in coordination with the JFP of the USMCEB. NAVEMSCEN participates in the JFP frequency assignment/ coordination process. Except for low power tactical operations, DON activities request authority for use of radio frequencies from unified commanders within their areas of responsibility. The military departments, however, have been authorized use of certain radio frequency bands, provided there is no interference with established radio services.

31.3 FREQUENCY ALLOCATION FOR ELECTRONIC COUNTERMEASURES OPERATIONS IN THE UNITED STATES AND CANADA

Frequency authorizations for certain bands to be used in ECM operations in the United States and Canada are established for U.S. military units on a standing basis. Frequency authorization for ad hoc ECM operations are satisfied through special coordination.

Commanding officers who use communications-electronic equipment must ensure that all radio frequencies are authorized and used in the correct manner. Host commanders shall prepare host-tenant agreements for tenant activities that use frequencies on their installations. The agreement will stipulate that the tenant shall cease, modify, or change a frequency should the need arise and that the tenant will coordinate his/her frequency requirements with appropriate naval authorities outlined herein. A listing of instructions that govern Navy frequency management and application matters is provided in Figure 31-1.

Figure 31-2 shows the security classification of frequencies when used alone and when associated with various designators. Figure 31-3 shows the radio astronomy frequency bands for the United States and it's possessions. Information on interpreting frequency assignments is found in NTP 6.

31.4 GEOGRAPHIC COORDINATION

Fleet CINCs will coordinate the use of radio frequencies within their areas of responsibility and also with commanders of unified and specified commands, when appropriate. The use of such frequencies by fleet units within or adjacent to the contiguous United States and Alaska or Hawaii shall be coordinated with the responsible command as listed below.

31.4.1 Eastern United States and Gulf Coast. JFMO LANT, Norfolk, VA is responsible for coordination of fleet frequency matters in the eastern and Gulf Coast areas of the United States, including the states of Minnesota, Iowa, Kansas, Oklahoma, Texas, and all states eastward. It will also coordinate with AFWTF Puerto Rico, as necessary, for frequency operations in that area. JMFO LANT will report to CINCLANTFLT in matters relating to this function.

31.4.2 Western U.S. COMPACMISTESTCEN, Point Mugu, CA is responsible for fleet frequency coordination matters, less frequencies used by NCTAMS EASTPAC for ship-shore-ship, air-ground, and fleet broadcast, in the Western area.

31.4.3 Hawaii. NCTAMS EASTPAC, Honolulu, HI is responsible for managing and coordinating tactical and nontactical frequencies assigned by NAVEMSCEN and JFMOPAC and will report to JFMOPAC matters pertaining to this function. When appropriate, NCTAMS EASTPAC will coordinate with frequency managers at area NAVCOMTELSTAs, who serve as NCTAMS EASTPAC area representatives. This coordination is especially important for resolution of frequency interference problems.

31.4.4 Alaska. JFMO Alaska has the responsibility for coordination of tactical and nontactical frequency matters, less matters involving NCTAMS EASTPAC ship-shore-ship, air-ground, and fleet broadcast functions, in the state of Alaska.

31.4.5 Other Areas. Fleet CINCs and/or area frequency coordinators will coordinate frequency usage within all other areas.

31.4.6 DOD Area Frequency Coordination. The USMCEB has approved terms of reference for a DOD radio frequency coordination system for national and service test and training ranges. Naval activities and forces that conduct operations within the geographic area of cognizance of AFCs will complete the actions required by these terms of reference.

31.5 REQUESTS FOR FREQUENCIES

Prior to the operation of any device intentionally radiating electromagnetic waves, a radio frequency authorization will be obtained from competent authority. Routine requests for frequencies should be forwarded to NAVEMSCEN via the appropriate naval area frequency coordinator and — in the case of naval tenant activities — via the installation host commander at least 90 days prior to commencement of the usage requirement if within the United States or its possessions. At least 120 days is required if the requirement is outside the United States and its possessions, using the format prescribed in NTP 6, Annex J.

If a CONUS shore-based activity operates in local police, fire, or emergency networks, the frequency request shall list the specific frequency and include a letter of concurrence from the local civil agency.

When there is a requirement for a frequency at a station located on any land or reservation under the

INSTRUCTION OPNAVINST UNLESS SPECIFIED	TITLE
2400.1	Frequency Allocation Plan for the 225 to 400 MHz Band
2400.10	Use of Voice Calls and VHF/UHF Frequencies for Aeronautical Air Traffic Control and Emergency Communications
2400.12	Memorandum of Understanding between the National Aeronautics and Space Administration and the Department of Defense Regarding the Assignment and Protection of Radio Frequencies for NASA Project Requiring DOD Support
2400.13	Government and Non-Government Narrowband Operations
2400.14	Frequency Allocation Plan for the 4400 to 5000 MHz Band
2400.15	Development, Procurement and Installation of Radio-Communications Equipment in the Frequency Range 14 kHz to 30 kHz
2400.16	Development, Procurement and Installation of Radio-Communications Equipment Operating In the Frequency Band 225 to 400 MHz (UHF)
2400.17	Development and Procurement of Radio-Communications Equipment Operating in the Frequency Range 30 to 100 MHz
2400.18	Guidance for Development of Navy Fuze Devices Which Employ the Radio Frequency Spectrum
2400.19	Frequency Tolerance Applicable to Navy and Marine Corps Communications-Electronics Equipment
2400.20	Coordination, Assignment and Use of Radio Frequencies
2401.1	Mobilization Plan IX-2
2401.3	Frequency Provision for Radio Command and Drone Control Devices
2410.1 (SECNAVINST)	Electromagnetic Compatibility Program Within the Department of the Navy
2410.12	Operation of Naval Radar Equipment in the Frequency Range 200 to 40,000 MHz
2410.15	Frequency Provisions for Air/Space Ground Telemetering
2410.19	Coordination and Use of Non-Government Allocated Frequency for Military Tactical and Training Purposes
2410.20	Classified Subject
2410.22	Communications Electromagnetic Compatibility Program-Reporting of U.S. Military Electronic Equipment Environment Data
2410.24	Frequency Provisions for Tactical Data Systems
2410.29	Analytical Services and Data Available From the DOD Electromagnetic Compatibility Analysis Center
2410.30	Development, Procurement and Operation of Restricted Devices and Industrial, Scientific and Medical Equipment in the Radio Frequency Spectrum
2410.31	Electromagnetic Compatibility Within the Department of the Navy
2410.33	Radar Interrogators Operating on 1030 MHz; Frequency Authorization for
2600.3	Publications Published by the International Telecommunications Union, Geneva and the Federal Communications Commission
5400.29	Radio Frequency Coordination Procedures for Use at National and Service Test and Training Ranges and Downrange Sites
5420.21	Navy Department Frequency Allocation Board
ACP -190 US SUPP-1	Guide to Frequency Planning
NTP 6	Spectrum Management Manual

Figure 31-1. Reference List for Frequency Management

1. A frequency, when not coupled with either an OPORD designator or circuit title, is unclassified unless otherwise dictated by the tactical situation.

2. An OPORD designator, when not coupled with either frequency or circuit title, is unclassified.

3. The combination of a frequency with its OPORD designator and/or circuit title is classified except in those cases where a particular circuit function has been widely promulgated as unclassified information (for example, distress frequencies, aeronautical radio ranges, etc.). The combination of a frequency with a Navy frequency list designator is unclassified since these designators are used to indicate families of frequencies.

Figure 31-2. Security Classification of Frequencies

BAND		USAGE
kHz	2495 to 2505	Secondary to standard frequency (2500 kHz)
	4995 to 5005	Secondary to standard frequency (5000 kHz)
	14,990 to 15,010	Secondary to standard frequency (15000 kHz)
	19,990 to 20,010	Secondary to standard frequency (20000 kHz)
MHz	24.99 to 25.01	Secondary to standard frequency (25.0 MHz)
	38.0 to 38.16	Low power military tactical and training operations may use this band. To the extent practical, such operations will be adjusted to relieve interference to radio astronomy observations. ITU Region 2 only
	73.0 to 74.6	Secondary to military communications and aeronautical radio-navigation (glidepath),
	322 to 329	
	404 to 406	Secondary to meteorological aids-radiosonde.
	610 to 614	ITU Region 3 only
	1400 to 1427	None
	1660 to 1670	Shared on a coequal basis with meteorological-satellite and meteorological aids (radiosonde). In peacetime meteorological-aids radiosonde will, to the maximum extent practical, be operated in 1670 to 1700 MHz band. To operate radiosonde in 1600 to 1670 MHz band, request authority from CNO (N6l) with justification and time period required.
	2690 to 2700	None
	4990 to 5000	None
GHz	10.68 to 10.7	None
	15.35 to 15.4	None
	19.3 to 19.4	None
	31.3 to 31.5	None
	88.0 to 90.0	None

Figure 31-3. Radio Astronomy Frequency Bands (United States and Possessions)

jurisdiction of the Forest Service of the Department of Agriculture or the Bureau of Land Management of the Department of the Interior, the date of notification for permission to make the installation on the subject land or reservation and the land office from which the notification was received must be included with the frequency request and forwarded to NAVEMSCEN.

Requests for renewal of temporary frequency assignments shall be forwarded to reach NAVEMSCEN 90 days prior to expiration.

Except under emergency conditions, any requirements for FCC radio monitoring, direction finding, or related services shall be submitted to NAVEMSCEN.

31.6 SPECIAL FREQUENCY USAGE REPORTS

Special reports are required when unfavorable findings of frequency assignments are returned by the IFRB because of the probability of harmful interference to assignments of other countries on the same or adjacent channels. These frequency assignments may be resubmitted for inclusion in the International Frequency List provided they are used for 60 days without complaint of harmful interference. Maximum use, for at least 60 days, during periods of favorable propagation for at least 60 days is required immediately after assignment.

31.7 PROTECTION OF CERTAIN FREQUENCY BANDS

The following bands are allocated exclusively for aeronautical mobile communications, primarily civil aviation (all in kHz):

2850 to 3025	8815 to 8965
3400 to 3500	10,005 to 10,100
4650 to 4700	11,275 to 11,400
5450 to 5480 (region 2)	13,260 to 13,360
5480 to 5680	17,900 to 17,970
6525 to 6685	

Frequencies within these bands shall not be used for any other purpose unless specifically authorized by NAVEMSCEN.

Unauthorized use is potentially hazardous to the safety of life and property. Precautions shall also be taken when using frequencies with harmonics in these bands, to ensure that the harmonics are properly suppressed. For example, the second harmonic of 2744 kHz falls within the 5480 to 5680 kHz band.

31.8 HARMFUL INTERFERENCE AND ELECTROMAGNETIC INTERFERENCE

Chapter 15 explains the rules regarding harmful interference. The format for reporting harmful interference is contained in OPNAVINST 3430.18.

31.9 RESTRICTIONS ON OPERATION OF CERTAIN EQUIPMENT

Special restrictions are imposed on operation of certain equipment to avoid the effects of harmful interference.

31.9.1 Shipboard Radar. AN/SPS-49 shipborne radars have caused harmful interference to authorized users of the 850 to 950 MHz frequency band in the United States and its possessions, according to FCC reports. Within coastal waters of other nations, AN/SPS-49 operating frequencies must be carefully selected to avoid harmful interference to foreign users in the affected frequency band. No restrictions apply to the use of the AN/SPS-49 radar outside the interference range of coastal areas.

The AN/SPY-1 air search shipboard radar has caused harmful interference to authorized users of the M3100 to 3500 band and caused major outages to commercial computer systems. As a result it should not be energized when within 25 miles of the United States and its possessions. Ships should consult with the applicable NCTAMS prior to operating the AN/SPY-1 within 25 miles of host countries. When in port the AN/SPY-1 radar should only be energized in the maintenance mode with the antennas pointed straight up.

31.9.2 Electronic Countermeasures. ECM should not be conducted within 150 miles of the United States and its possessions without first consulting with current Joint ECM directives. When conducting ECM training missions it is important to plan well in advance due to the lengthy coordination time required (45 days minimum) to obtain special clearance. Clearance of national, formerly referred to as restricted, bands must be submitted via local AFCs. Tactical and local FCC designated bands require a similar time period and are also submitted to the applicable AFC. ECM may not be conducted without proper clearance.

31.9.3 Global Positioning Satellite Testing and Jamming. GPS testing and jamming on M1227.6 and M1575.42 are not authorized without proper clearance. Requests for clearance must be submitted to the applicable AFC with sufficient lead time (60 days minimum) to coordinate use.

31.9.4 Link 16 Use. Link 16 operates on 51 frequencies within the M969 to 1215 band. This band is internationally allocated for aeronautical radio navigation and has several limitations imposed on its use within 200 miles of the United States, its possessions, and host countries. Link 16 will not be energized within this range without an authorized frequency assignment and compliance with applicable restrictions and limitations.

PART X — MISCELLANEOUS

CHAPTER 32 — Navy-Marine Corps Affiliate Radio System and Other Amateur Radio

CHAPTER 32

Navy-Marine Corps Affiliate Radio System and Other Amateur Radio

32.1 THE NAVY-MARINE CORPS MARS SYSTEM

The Navy-Marine Corps MARS program, for which COMNAVCOMTELCOM is responsible, has been active since 1963. The program's mission is to provide Navy-sponsored emergency communications on a local, national, and international basis as an adjunct to normal naval communications. Functions of the Navy/Marine Corps MARS program are to:

1. Provide MARS support for JCS wartime communications as identified in Appendix C of the National Military Command system, DOD Emergency Communications Plan

2. Provide support to the NCS Shared Resources (SHARES) HF program in support of national security and emergency preparedness activities

3. Provide auxiliary communications to military, civil, and/or disaster officials during periods of emergency

4. Assist in effecting normal naval communications under emergency conditions

5. Handle official, quasi-official, and morale voice, data, and message communications for Armed Forces and authorized U.S. Government civilian personnel stationed throughout the world

6. Create interest and furnish a means of training members in naval communications procedures

7. Provide a potential reserve of trained radio communications personnel for military duty when needed

8. Conduct, in conjunction with the MARS programs of the Army and Air Force, an appropriate amateur radio program as part of the annual celebration of Armed Forces Day.

The MARS program supports and encourages amateur radio activity within the Navy but does not jeopardize the independent prerogatives of individual amateurs. Cooperation is effected with the Army and Air Force, as well as official amateur organizations and the FCC. Amateur licenses issued by the FCC or other competent authority are recognized. Details on the MARS program appear in COMNAVCOMTELCOMINST 2093.1. MARS operating procedures are contained in NTP 8. Inquiries concerning MARS programs should be addressed to COMNAVCOMTELCOM (N33). Figure 32-1 shows Navy MARS districts.

32.1.1 MARS Support of Emergency Communications. A function of Navy-Marine Corps MARS is to provide auxiliary communications to military, civil, and/or disaster officials during periods of emergency. It is CNO policy that the support of emergency communications will be provided by MARS under the provisions of COMNAVCOMTELCOMINST 2093.1.

Incorporating MARS into area/regional disaster preparedness is encouraged; however, all emergency communications plans that involve MARS must be approved by appropriate authority before implementation. To assist naval reserve activities during emergency operations, reserve communications networks will, insofar as is feasible, combine with Navy-Marine Corps MARS and function as a part of that system.

When otherwise not needed in support of naval communications requirements, MARS may support civil disaster officials in providing emergency communications facilities. Such services shall complement and not substitute for the services of other communications facilities.

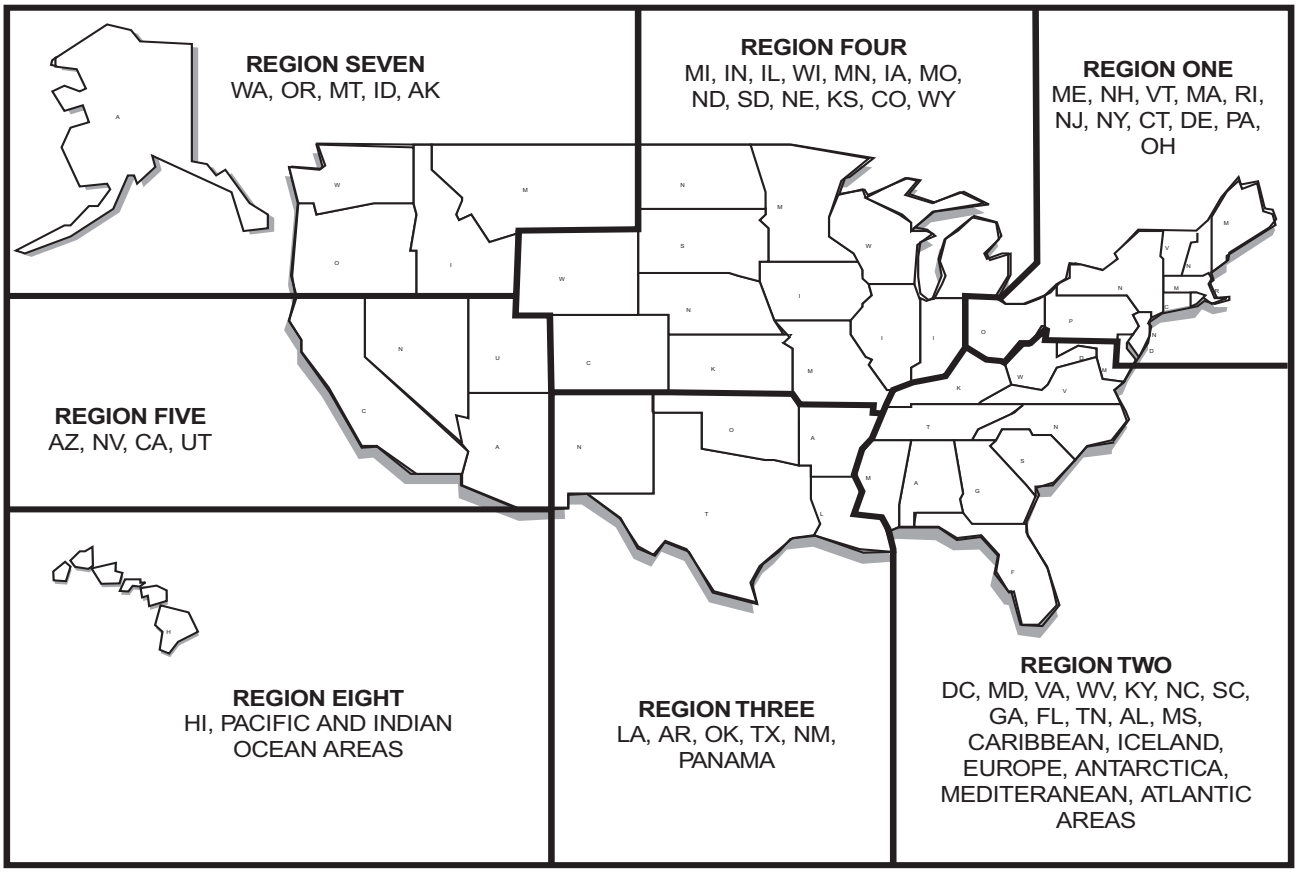

Figure 32-1. Navy-Marine Corps MARS Regions

Commanding officers and officers-in-charge of Navy and Marine Corps Reserve training centers, Navy Reserve training centers, and Navy Reserve training facilities shall encourage membership in Navy-Marine Corps MARS.

32.1.2 MARS Consensual Monitoring. SECDEF has granted Navy the authority to engage in consensual monitoring of MARS communications for COMSEC purposes. To satisfy the consent requirements of COMSEC monitoring, as outlined in various directives, it is necessary that at least one party to every MARS communication be aware that use of the system constitutes consent to being monitored. To ensure there is no question in this regard, each MARS station will retain on file for a period of 1 year a consent form signed by prospective MARS users that states: "I understand that periodic COMSEC monitoring of MARS conversations will occur and that use of MARS equipment constitutes consent to such monitoring." These consent forms shall be retained with MARS circuit logs and afforded the same protection/retention as those logs. Additionally, the following sign shall be displayed in full view of MARS users: "MARS communications are subject to communications security monitoring at all times. Use of MARS constitutes consent to communications security monitoring."

COMSEC monitoring of MARS will be conducted only as specifically authorized by Fleet CINCs. The authority to conduct COMSEC monitoring of the MARS system does not alter the mission and functions of the MARS organization and should not reduce the morale value of the system. It is not the intent of this authority to jeopardize the privacy or civil liberties of the private citizens using the MARS network. The granting of this authority allows consensual COMSEC monitoring of MARS transmissions to ascertain and reduce its security vulnerabilities and to ensure the continued availability of a significant morale enhancement operation.

32.2 OTHER AMATEUR RADIO

Shipboard amateur radio authorization and operation will be in accordance with the policies, directives, and operations orders of the appropriate fleet commander. Only individual type amateur radio stations will be used

CLASS	FREQUENCY (MHz)	USE
A	460 to 470	Citizen's Band
B	460 to 470	Citizen's Band
C	26.96 to 27.23 27.255 72 to 76	Radio Control Radio Control of Model Aircraft
D	26.96 to 27.23 27.55	Citizen's Band (R/T only)

Figure 32-2. Citizens Band Frequency Allocations

for shipboard amateur radio activity. Afloat commands authorized amateur radio privileges must meet the requirements of COMNAVTELCOMINST 2070.1 and Vol. VI, Part 97 of FCC Regulations.

Operators shall be directed not to divulge classified movements or other classified information through the use of amateur radio. Commanding officers are responsible for requiring strict adherence to the criteria of all applicable EMCON orders by amateur radio operators aboard their vessels.

Amateur radio installations on board U.S. Navy ships must conform to good engineering practices and be so configured that compliance with EMCON restrictions is ensured.

Commanding officers may authorize the use of installed radio transmitters and receivers for amateur use if the installation of a commercially procured amateur radio station is not practical because of space limitations, funds, or similar restrictions. All requirements of COMNAVTELCOMINST 2070.1 must be adhered to.

32.2.1 Citizen's Band Radio. Citizen's band radio equipment will be operated in accordance with the rules outlined in Vol. VI Part 95 of FCC Regulations. Figure 32-2 shows authorized citizen's band frequencies and their usage.

Appendices

APPENDIX A

General Message Types and Distribution

A.1 GENERAL MESSAGE TYPES AND DISTRIBUTION

General message procedures are covered in Chapter 17. Figure A-1 contains information on types and distribution of general messages. Figure A-2 shows general message routing.

SHORT TITLE	ORIGINATOR	CONTENT	DISTRIBUTION AND NOTES
ALCOAST	Commandant Coast Guard	U.S. Coast Guard. Equivalent of NAVOP.	All Coast Guard ships, commands, and activities and CNO. The Navy is responsible for delivery to Coast Guard units operating directly within the Navy. ALCOASTs are not normally distributed to BASEGRAM delivery authorities except during national emergencies and wartime.
ALCOM	CNO	Policy matters on naval communications.	All Navy and Marine Corps commands and activities; COMSC and all MSC commands and offices ashore; MSC ships (see NTP-10); Coast Guard Commandant; Coast Guard area and district commanders; CINCPAC; and CINCLANT.
	COMNAVCOMTELCOM	COMMPUB corrections and administrative communication matters.	Same as CNO ALCOM.
	COMNAVSECGRU	Cryptographic matters (CMS, etc.).	Same as CNO ALCOM.
ALCOMLANT “A”	CINCLANTFLT	A subdivision of the ALCOM series for the Atlantic and Mediterranean areas.	All Navy and Marine Corps commands and activities in the Atlantic, Mediterranean and Middle East areas; COMSC and all MSC commands and offices ashore in the Atlantic, Mediterranean, and Middle East areas; MSC ships (see NTP-10); CINCPACFLT; Coast Guard Commandant; Coast Guard area and district commanders in the Eastern area; and CNO.

Figure A-1. Common Types of General Message (Sheet 1 of 3)

ALCOMPAC "P"	CINCPACFLT	A subdivision of the ALCOM series for the Pacific area.	All Navy and Marine Corps commands and activities in the Atlantic, Mediterranean, and Middle East areas; COMSC and all MSC commands and offices ashore in the Atlantic, Mediterranean, and Middle East areas; MSC ships (See NTP-10); CINCLANTFLT; Coast Guard Commandant; Coast Guard area and district commanders in the Western area; and CNO.
ALDIST	Commandant Coast Guard	Instructions, including those of policy level or information of limited application, primarily to Coast Guard district commanders.	All Coast Guard area commanders, district commanders, headquarters units, and CNO.
ALDODACT	SECDEF	Disseminate unclassified information to all installations and activities throughout DOD.	As appropriate.
ALFOODACT	Commander, Defense, Personnel Support Center	Hazardous food and drug information.	All U.S. military activities worldwide.
ALLANTFLT	CINCLANTFLT	Equivalent of NAVOP for commands within CINCLANTFLT.	All commands and activities under CINCLANTFLT. Also CINCPACFLT, Coast Guard Commandant, COMLANTAREA COGARD, COMSC, CINCACOM, USCINCSO, and CNO.
ALMAR	CMC	Matters concerning the functions of the Marine Corps commands.	Marine Corps commands and Navy commands as appropriate.
ALMILACT	JCS	JCS matters affecting all military activities.	All U.S. activities worldwide.
ALMSC	COMSC	MSC matters.	See NTP-10.
ALNAV	SECNAV	Matters concerning the functions of the naval establishment, including the Marine Corps. (ALNAVs are normally unclassified).	All Navy and Marine Corps commands and activities; COMSC and all MSC commands and officers ashore; MSC ships (use NTP-10); Coast Guard Commandant; CINCPAC; CINCLANT; and all commands and activities with Navy and Marine Corps personnel assigned.
ALNAVEUR	CINCUSNAVEUR	Equivalent of NAVOP or NAVADMIN for commands within NAVEUR.	All commands under CINUSNAVEUR.

Figure A-1. Common Types of General Message (Sheet 2 of 3)

ALNAVSTA	SECNAV	Similar to ALNAVs. (Are usually be unclassified).	All Navy and Marine Corps commands and activities located ashore including shore-based elements of the operating forces, COMSC, all MSC commands and officers ashore, Coast Guard Commandant and CNO.
ALPACFLT	CINCPACFLT	Equivalent of NAVOP or NAVADMIN for commands within CINCPACFLT.	All commands and activities under CINCPACFLT. Also CINCLANTFLT, Coast Guard Commandant, COMPACAREA COGARD, COMSC, CINCPAC, USCINCSO, and CNO.
ALSAFE	COMNAVSAFECEN	Disseminates hazard and safety advisory information.	All Navy, Marine Corps, and Coast Guard activities.
ALSVACT	JCS	A general message assigned to the JCS for the imposition of Minimize or for the dissemination of other instructions on a classified basis that have worldwide application.	All U.S. activities worldwide that use military communications.
JAFPUB	USMCEB	Corrections to communication publications.	All U.S. military activities.
LANTADMIN	CINCLANTFLT	Equivalent of NAVADMIN for commands within CINCLANTFLT.	All commands and activities under CINCLANFLT. Also CINCPACFLT, Coast Guard Commandant, COMLANTAREA COGARD, COMSC, CINCACOM, USCINCSO, and CNO.
NAVACT	SECNAV	See ALNAV.	Same as ALNAV less Marine Corps.
NAVADMIN	CNO, CNP	Provides policy implementation guidance of Navy-wide interest.	All Navy activities.
NAVNEWS	CHINFO	U.S. Navy News.	Same as SECNAV/ALNAV.
NAVOP	CNO	Promulgate policy of Navy-wide interest.	All Navy activities.
NAVPUB	COMNAVDOCCOM	Publication information — status, changes, and cancellations.	All Navy, Marine Corps, and Coast Guard activities.
PACADMIN	CINCPACFLT	Equivalent of NAVADMIN for commands within CINCPACTFLT.	All commands and activities under CINCPACTFLT. Also CINCLANTFLT, Coast Guard Commandant, COMLANTAREA COGARD, COMSC, CINCACOM, USCINCSO, and CNO.
PACOMACT	CINCPAC	Minimize implementation. May be used for other purposes. Do not duplicate with Navy-originated message.	Same as ALCOMLANT plus JCS, CSA, CSAF, CINCLANT, CINCEUR, STRATCOM, CINCRED.

Figure A-1. Common Types of General Messages (Sheet 3 of 3)

MESSAGES	INSTRUCTIONS
ALNAV ALCOM ALCOMLANT “A” ALCOMPAC “P” ALLANTFLT ALMAR ALPACFLT ALSAFE LANTADMIN NAVACT NAVADMIN NAVNEWS NAVOP NAVPUB PACADMIN	The originator will route the message to a collective routing indicator (lists AUTODIN subscribers concerned with that general message) plus CINCUSNAVEUR, COMUSNAVCENT, naval force commanders, all NCTAMS and all NAVCOMTELSTAs located outside CONUS. Fleet broadcast originating stations are responsible for placing the message on their respective broadcasts. Distribution authorities (fleet commanders and naval force commanders) are responsible for further distribution of general messages to those activities within their area of responsibility that are not AUTODIN/DMS subscribers by: 1. Maintaining an up-to-date routing guide on non-AUTODIN/DMS subscribers in their areas of responsibility for each general message. 2. Rerouting general messages into AUTODIN/DMS as appropriate. 3. Delivering by other means when required and authorized (as determined by the distribution authority). 4. Mailing, delivering over-the-counter or by FAX or MODEM (appropriately covered if classified traffic is passed) to those addressees who do not receive 4. messages by electrical means or who cannot receive classified 4. messages electronically.
ALNAVSTA ALNAVEUR	The originator will route the message to all AUTODIN/DMS subscribers concerned with that type of general message plus distribution authorities (fleet commanders and naval force commanders) who were not included as AUTODIN/DMS subscribers. Distribution of these general messages is as noted for ALNAVs and so forth.

Figure A-2. General Message Routing

APPENDIX B

Key Naval Computer and Telecommunications Activities

B.1 ATLANTIC AREA

NCTAMS LANT Norfolk, VA

NAVCOMTELSTA Cutler, ME

NAVCOMTELSTA Iceland

NAVCOMTELSTA Jacksonville, FL

NAVCOMTELSTA Pensacola, FL

NAVCOMTELSTA Roosevelt Roads, PR

B.2 PACIFIC AREA

NCTAMS PAC Wahiawa, HI

NAVCOMSTA Stockton, CA

NAVCOMTELSTA Diego Garcia

NAVCOMTELSTA Far East Yokosuka, JA

NAVCOMTELSTA Guam

NAVCOMTELSTA Puget Sound

NAVCOMTELSTA San Diego, CA

B.3 EUROPEAN AREA

NCTAMS MED Naples, IT

NAVCOMTELSTA Sigonella, Sicily

NAVCOMTELSTA Bahrain

APPENDIX C

Communications Readiness Check-off List

AT LEAST TWO MONTHS PRIOR TO DEPLOYMENT	
	Spare parts allowance checked and action initiated to bring it up to required level.
	Major combatants shall request visit by Communications Assistance Team (CAT).
	Perform maintenance checks in accordance with the Planned Maintenance Subsystem (PMS).
	Ensure all equipment (cyrpto, reproductive, teletype, etc.) NEC/repair school/training requirements for personnel have been met.

AT LEAST SIX WEEKS PRIOR TO DEPLOYMENT	
	All transmitters and transceivers completely checked in all modes of operation.
	All teletype equipment cleared and adjusted.
	All receivers checked in all modes of operation and aligned for maximum security.
	All PCs and related software applications used as part of communications suites checked for currentness. Also ensure that sufficient numbers of personnel are trained on application use.
	All antenna patch boards and patch cord connectors thoroughly cleaned and checked for loose connections.
	All antennas and antenna couplers inspected in accordance with PMS requirements and applicable EIBs (i.e., EIB 42, 780, 785, 791, 810, 812 and 896).
	Perform maintenance checks in accordance with PMS requirements.
	Inform servicing CMIO of date of departure. Submit request for CMS material that will be required for out-of-area and/or special operations. Ensure OTAR/OTAT devices and SOPs for deployment areas are held. Ensure EHF TRANSEC keys are ordered for each AOR in which operations are anticipated.
	Ensure all satellite equipment checked and aligned.
	Obtain current list of publications, directives, and instructions necessary for out-of-area and/or special operations. Ensure all publications, directives, and instructions are held or delivery arranged prior to departure or en route to the deployment area.
	Request CAT visit from NCTAMS.

	AT LEAST TWO WEEKS PRIOR TO DEPLOYMENT
	Single sideband transmitter and receiver master oscillators checked by the frequency standard (AN/URQ-9/10).
	Perform operational checks in accordance with PMS schedules.
	Perform operational checks and alignments:
	a. Automated message processing system (e.g., NAVMACS)
	b. AN/SSR-1 satellite broadcast receiver
	c. AN/WSC-3 satellite transceiver
	d. Secure voice equipment
	e. INMARSAT terminal and other commercial satellite equipment.
	Determine higher usage rate for consumables and stock to 90-day fill level in accordance with current directives.
	Overhaul all message reproduction equipment. Ensure repair personnel assigned. Obtain sufficient repair parts for reproductive equipment.
	Review applicable predeployment manuals, LOIs, and OPORDs for area of deployment.
	Ensure guard list is up to date.

AT LEAST ONE WEEK PRIOR TO DEPLOYMENT	
	All antennas thoroughly cleaned and meggered.
	Perform maintenance checks in accordance with PMS.
	Inform servicing Defense Courier Service stations of date of departure and material delivery routing instructions.

PREDEPLOYMENT TRAINING REQUIREMENTS	
	Review doctrine and policy of NCTAMS covering all areas that will be transited and LOIs and OPORDS for areas of deployment.
	Note and train for differences in broadcast alignments, channelization, and anticipated traffic volumes.
	Post frequency assignments for broadcast and ship-to-ship.
	Ensure personnel are familiar with operation and maintenance procedures for any newly installed systems.
	Ensure optimum internal handling procedures are established and practiced to handle increased traffic volume.
	Review procedures for pigeon post and AUTOCAT in conjunction with EMCON and HERO conditions.
	Ensure radio telephone procedures and OTAT/OTAR procedures are established and practiced in accordance with applicable fleet directives.
	Ships deploying to the Mediterranean shall review NATO procedures and requirements.

APPENDIX D

Joint and Naval Communications Publications

JOINT COMMUNICATIONS PUBLICATIONS	
LONG TITLE	**SHORT TITLE**
Doctrine for C4 Systems Support to Joint Operations	JP 6-0
Tactical Digital Information Link (TADIL)	JP 6-01 Series
Joint Doctrine for Operational/Tactical C4 Systems	JP 6-02
Joint Operational/Tactical C4 Systems Overview	JP 6-02.1
Joint Connectivity Handbook	JP 6-02.2
Joint Communications-Electronics Operations Instructions	JP 6-02.3
Joint Spectrum Management	JP 6-02.4
Joint Key Management System	JP 6-02.5
US Message Text Formatting (USMTF)	JP 6-04 Series
Joint Tactical Communication Systems	JP 6-05 Series
JTTP for HAVEQUICK and SINCGARS	JP 6-06 Series

NAVAL COMMUNICATIONS PUBLICATIONS	
LONG TITLE	**SHORT TITLE**
Naval Special Warfare Communications	NWP 3-05.12
Naval Command and Control	NDP 6-0
Command and Control	NWP 6-00.1
Basic Operational Communications Doctrine	NWP 6-01
Battle Group Communications	NWP 6-01.1
Communications	NWP 6-01.2M
Command and Control of Operational Forces	NWP 6-02
Guide to Electromagnetic Interference Control	NWP 6-05.01M
Radio Operator's Handbook	NWP 6-05.02M
Spectrum Management in Joint Environment	NWP 6-05.1M

APPENDIX E

Requesting Services

E.1 GENERAL

Communication support services are requested in several ways depending on the service. All services are requested using a naval message with specified formats. Each Fleet CINC or NCTAMS has specific procedures for requests; therefore, this appendix will discuss them in general terms.

E.1.1 Guard Shift and Termination Requests. When a Navy command changes the method that it sends or receives messages it will submit a Guard Shift and a Termination Request. These are directed to the appropriate NCTAMS. The guard shift advises when the change will take place, what the exact change is (OTC to BCST), and any special requirements. It will also state the type of termination that will be requested. The Termination request will indicate how the ship will send outgoing messages (usually via CUDIX).

E.1.2 UHF Satellite Request. Since all satellite resources are under the authority of the unified commanders, the assignment of channels is usually done by the fleet commander. These requests are usually made by the senior commander of an operation or exercise and are consolidated. The consolidated request is then submitted to the Fleet CINC for assignment of an ICDB and priority number. If the channels are to support a CJTF they are submitted directly to the unified commander. (Priority numbers are in Figure E-1.)

E.1.3 SHF Satellite Request. Requests for DSCS bandwidth are submitted directly to the fleet commander. Since the Fleet CINC has a limited amount of bandwidth, early planning is important. Most routine requests can be filled if planned ahead. If any requirements cannot be met from the Fleet CINC pool, they can be requested from the unified commander.

E.1.4 EHF Satellite Request. EHF was the first system fielded after MOP 37 became effective. Therefore, unified and fleet commander planners made efforts to ensure that MOP 37 would be followed from the very first access request. As a result, all EHF requests for surface ships, aircraft carriers, and shore stations are made to the unified commander via the fleet commander or CJTF. Requests from submarines operating independently are made through the SUBOPAUTH.

E.1.5 Frequency Requests. Communications planners must obtain clearance to use tactical frequencies and air navigation aids. The procedures differ slightly in each ocean area and are found in the Fleet CINC's OPORDER.

E.1.6 Tailored Support Requests. Battlegroup and JTF communication planners may have some specialized shore-related requirements, i.e., a DAMA timeslot for battle group TTY that is related to a channel on the FSB for the battle group broadcast. These requests are made directly to the appropriate Fleet CINC or fleet commander, with an information copy to the area NCTAMS.

E.1.7 Emergency Requests. There are some short notice requests that must be dealt with immediately to ensure continued operations, i.e., activation of additional weather FAX frequencies, activation of a single channel HF broadcast, or to report interference. These requests are made via immediate COMSPOT messages to the appropriate NCTAMS.

E.1.8 Other Requests. There is potential for many additional types of service requests. Procedures for them are found in other doctrine publications, OPORDs, and CIBs.

MILITARY SATELLITE COMMUNICATIONS PRIORITIZATION

Priority	User Category
I	**Strategic Order (Essential to National Survival)**
	a. System Control/Orderwire b. National Command Authorities • Presidential Support • Secretary of Defense Support c. Strategic Warning/Intelligence d. SIOP Requirements
II	**Warfighting Requirements**
	a. Department of State Diplomatic Negotiations b. CJCS c. CINC (Unified Commander) d. JTF/CTF (CTF is Multinational Combined Task Force) e. Component Support f. Tactical Warning/Intelligence g. CJCS Sponsored and Other Selected Exercises h. Counter-Narcotics Operation
III	**Essential Support**
	a. Other Intelligence (e.g., Technical, Economic) b. Weather c. Logistics d. MIJI Support (For Efforts Supporting a Specific User) e. Diplomatic Post Support f. Minimum Circuits for TT&C From Space Vehicles and Primary Circuits for Manned Space Flights g. Other Service Support
IV	**Training**
V	**VIP Support**
	a. Service Secretaries b. Chiefs of the Services and Commanders of Unified and Specified Commands c. Other
VI	**RDT&E**
	a. DOD Test and Demonstration
VII	**Miscellaneous**
	a. DOD Support to Law Enforcement Agencies b. Non-DOD Support c. Non-U.S. Support d. Other

Figure E-1. Military Satellite Communications Prioritization

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