Chapter 5

Multichannel Control System

5-1. System Description

a. With multichannel TACSAT communications terminals in use by the Army, Air Force, and Marine Corps, the DSCS controller cannot accommodate the increased number of users. The ground mobile forces satellite communications (GMFSC) system operates as a subnetwork providing its own control system. This prevents interference degradation for other users of the DSCS SHF satellites.

b. The GMF satellite communications control centers (GMFSCCC), AN/MSQ-114 and AN/FSQ-124, provide mobile and fixed control facilities. The USAISC'S operation and control procedures contain specific information and instructions on GMFSC planning control, management, and terminal user procedures. (These procedures are currently being revised.)

c. Specially trained US Army GMF controllers provide GMFSC control for the terminals deployed by the multiservice (Army, Air Force> and Marine Corps) GMFSC system. The GMF controllers continuously monitor the downlink signals for all terminals in their networks to control uplink signals. They direct changes as necessary. The controller ensures that all terminals operate within the proper limits of frequency, power, and channel capacity. Should any discrepancies take place, the controller communicates by orderwire to initiate the changes necessary.

d. The GMFSCCC operates in the SHE frequency range of 7.9 to 8.4 GHz transmit and 7.25 to 7.75 GHz receive. Orderwire and AJ/CM units are used for communicating with terminals under their control. The satellite automatic monitoring system (SAMS) is used to monitor downlink frequencies of all terminals. This provides control over uplink power and frequency.

5-2. Deployment

The AN/MSQ-114 is usually deployed one unit per theater of operation. Since the AN/MSQ-114 is a limited production item, its deployment is rigidly controlled. The AN/MSQ-114 can support forward deployed forces, nonforward deployed forces, or contingency operations. Nonforward deployment usually refers to the home location of the GMFSSCCC (either AN/MSQ-114 or AN/FSQ-124). The control system must be within the respective satellite footprint, which usually is the NC/AC antenna footprints for DSCS II or the GDA footprint for the DSCS III satellites. (See Figures 5-1 through 5-4.) Using DSCS II, a GMFSCCC located in Korea can control GMF terminals in CONUS, provided the control system and GMF terminals are within the NC/AC footprints on that satellite. (See Figure 5-3.) On DSCS III, the control system and GMF terminals must be within the GDA footprint. If the NC/AC or GDA footprint is moved to support a mission so that the control system falls outside the footprint, the AN/MSQ-114 would be deployed into a footprint to allow control coverage of the GMF mission.

5-3. Employment

a. In their normal employment, the AN/MSQ-114 and the AN/FSQ-124 can control a number of GMFSC terminals. The exact number of terminals being controlled depends on the network configuration and the mission requirement. A point-to-point configuration is used when connectivity between two low capacity terminals is desired. The hub-spoke configuration uses a multichannel terminal as the hub. Up to four low capacity terminals are used as the spokes. When at least two hub terminals are connected by communications and each operates with up to three spoke terminals, a hybrid configuration is derived. The control terminal can monitor and control any configuration that may be active within the control area.

b. In the networks designated for control by an AN/MSQ-114 terminal, the controller--

- Coordinates satellite access data with the GMF manager.
- Establishes positive GMFSC subnetwork satellite control.
- Evaluates and determines satellite link parameters.
- Establishes and reconfigures approved satellite networks.
- Conducts antijamming operations.

The first step in the start procedure after the AN/MSQ-114 is on station at a new location is to activate the control orderwire to the DSCS controller. Frequencies to be transmitted and received are authorized by the GMF manager from an allotment granted to the GMFSC system by DCA. Other system parameters that are determined prior to start are transmit power, number of channels, and type of modulation coding priority. The GMF controller accesses each tactical terminal using the control terminal (CT) orderwire. The controller then directs the adjusting of transmit power to achieve planned link performance. Measurements are made and entered into the SAMS for real-time monitoring of the link.

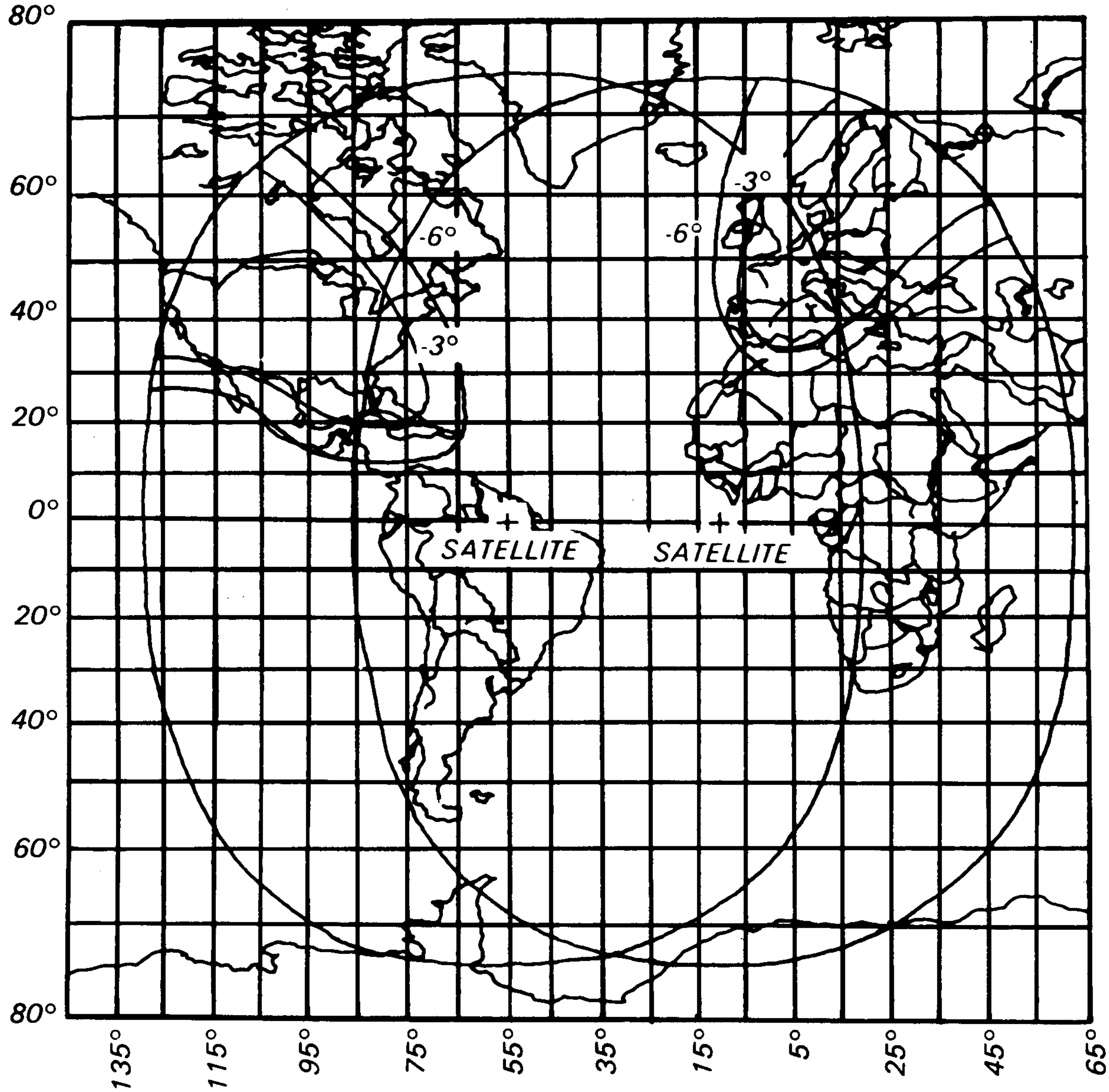

Figure 5-1. Western Atlantic (WESTLANT) and Eastern Atlantic (EASTLANT) satellite areas.

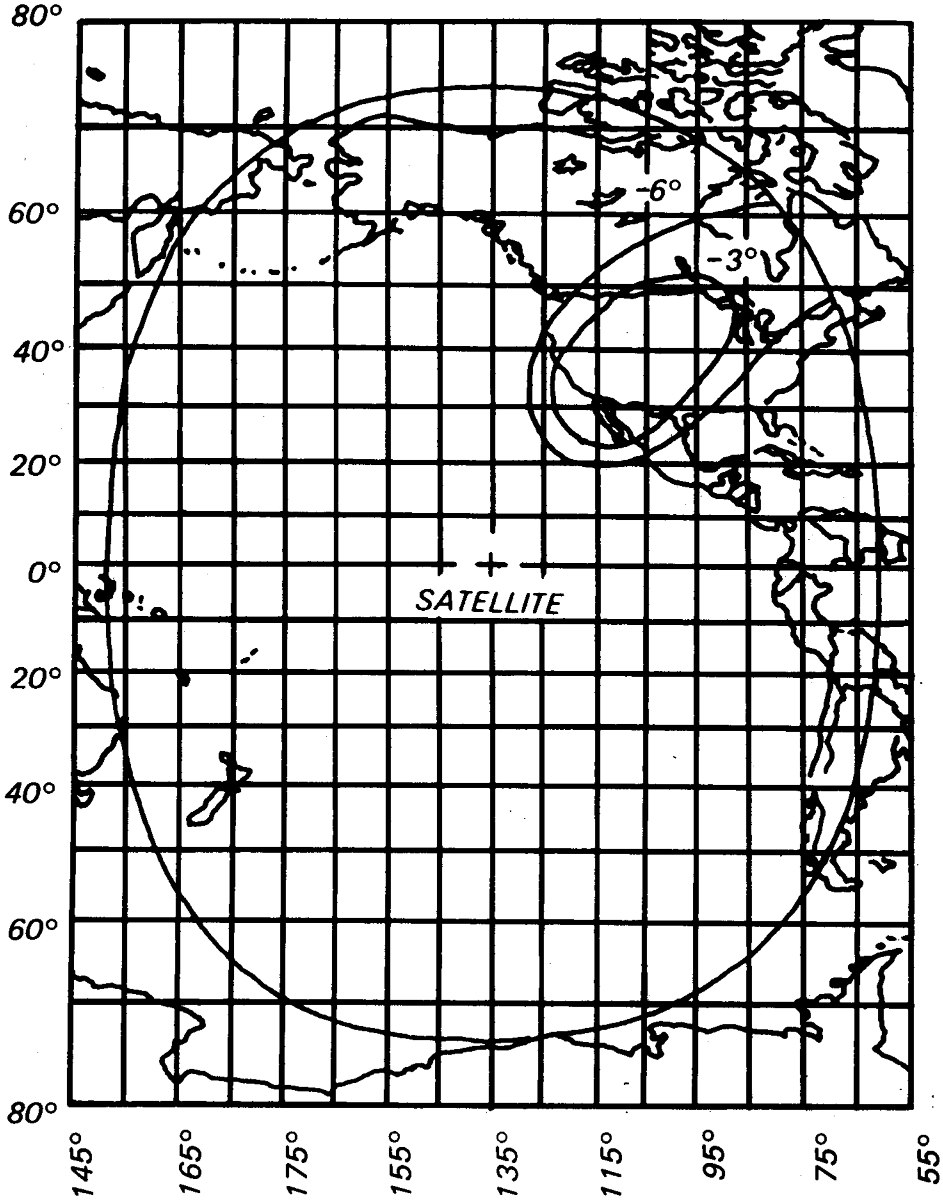

Figure 5-2. Eastern Pacific (EASTPAC) satellite area.

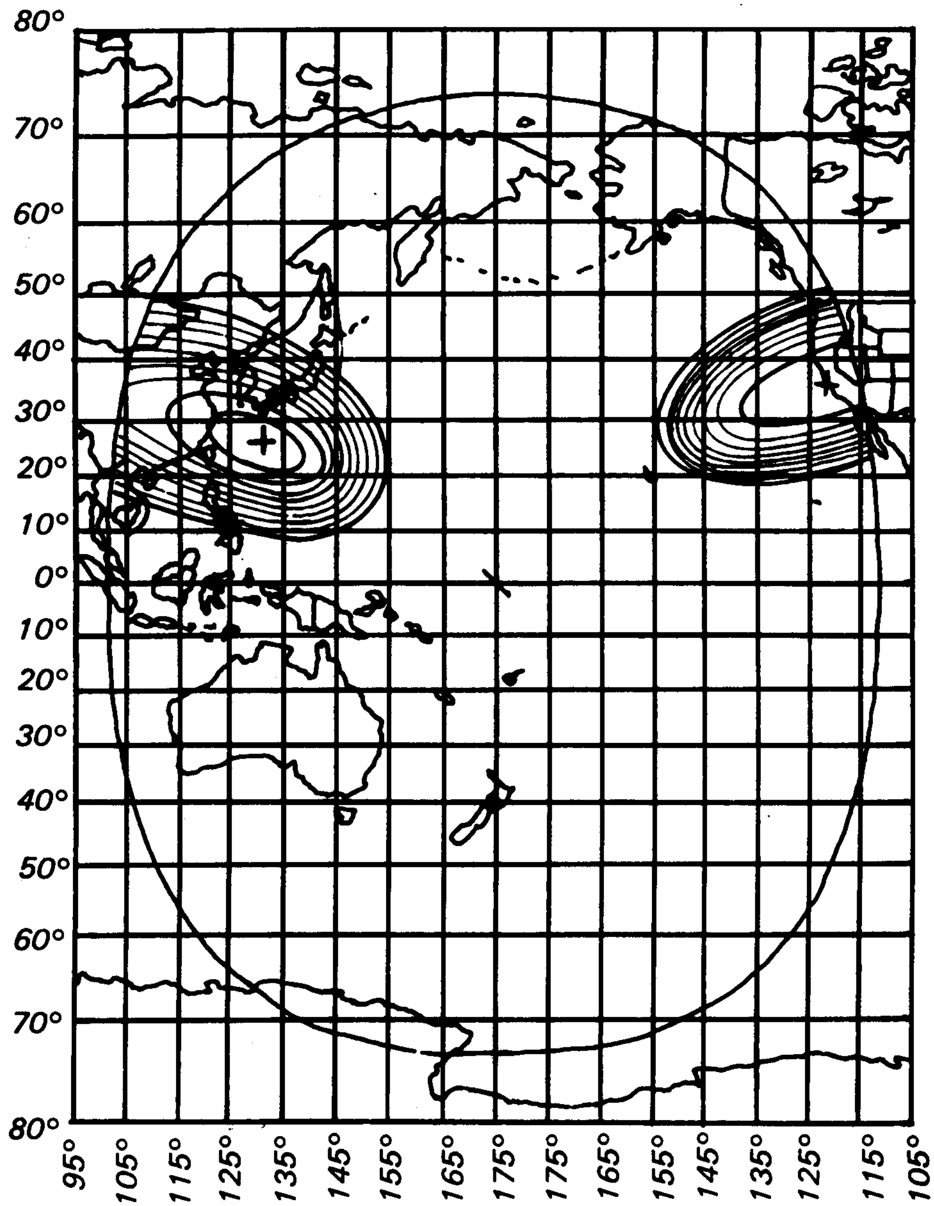

Figure 5-3. Western Pacific (WESTPAC) satellite area.

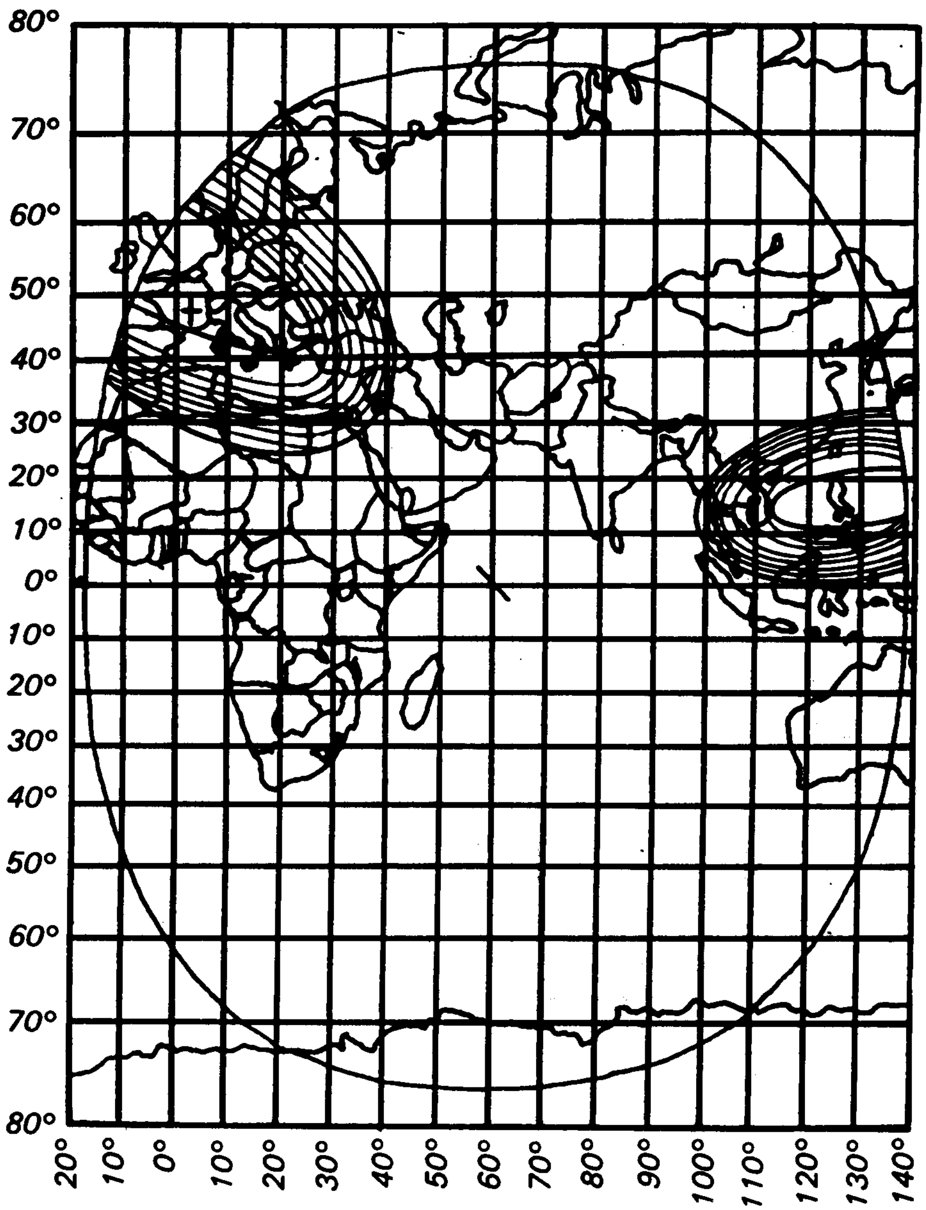

Figure 5-4. Indian Ocean (IO) satellite area.

c. To evaluate link parameters, the SAMS monitors the network for out of tolerance conditions. Manual spectrum analyzers and user reports are also used to evaluate link parameters. Bad weather, equipment, operator errors, satellite problems, and intentional or unintentional interference may cause problem conditions. The GMF controller detects and analyzes network problems. The next step is to direct work-around solutions. These solutions may be temporary power adjustments, reduction-in-link capacity (drop out by priority) or instructions to operators. In some cases, it may be necessary to interrupt service for major maintenance actions. The GMF controller maintains a log of all problems and terminal faults. A network status display printout is also maintained. The status display printouts that are available in the SAMS data base are status and statistics reports. These reports are available as a hard copy, a cathode ray tube (CRT) display, both on command, or at regularly timed intervals.

(1) The status report displays the condition of authorized carriers under control of the AN/MSQ-114. This is done by a measured carrier to noise temperature ratio (C/KT) reading, a calculated energy per bit to noise density ratio (Eb/No), an operating noise temperature, an authorized C/KT and a percentage of satellite allocated power for each terminal. A summary page of the status report shows--

- Measured percentage of transponder power.
- Allocated percentage of transponder power.
- Measured percentage of GMF power.
- Measured transponder C/KT.

(2) The statistics report is generated for a given start and stop time frame with an established number of samples taken. For each terminal under control of the AN/MSQ-114, the report shows--

- Mean C/KT (dB).
- Authorized C/KT (dB).
- Departure from authorized C/KT (dB).
- Highest C/KT and time measured.
- Lowest C/KT and time measured.
- Number of samples taken.

d. Often, during network operations, it may be necessary to reconfigure a real-time link or the whole network. Some of the causes for reconfiguration are:

- Rapid terminal relocation.
- Enemy action.
- Degradation of a link.
- Changes in communication requirements.

e. Reconfiguration by adding or deleting terminals is done by the GMF controller. This involves changes to the SAMS data base and coordination with the tactical terminal by orderwire. Terminal relocation requires immediate action by the controller to coordinate the movement. New system parameters and look angles must be provided and the SAMS data base updated. Adding a new type earth terminal and using a new satellite also requires reconfiguration. The GMF controller has the authority to reconfigure the network until changes in satellite power or new frequency assignments are required; then, the GMF manager must be informed of the change required. The DSCS controller is responsible for the DSCS satellite communications network. Since the GMF network is only a subnet, the GMF controller must interface with the DSCS controller when any action that takes place might impact on network performance. Coordination is normally required--

- Before GMFSC terminals come on the air.
- When changes in GMFSC transmit power are required.
- When serious link degradations occur that cannot be isolated by the GMF controller.

f. A more serious condition is when the DSCS controller informs the GMF controller that violations have taken place in the GMFSC network. As mentioned previously, a major duty of the GMF controller is to monitor the uplink and downlink characteristics of the GMFSC network for out of tolerance conditions. The result of this monitoring is to help TACSAT communications terminal operators find stations that are at fault and correct the problems. In severe cases, such as satellite failure or interference, the DSCS controller must help pinpoint and rectify the problem. The GMF controller, closely coordinating with the DSCS controller, directs and implements network antijamming plans.

5-4. Control and Management

TACSAT communications links are not independent, unlike conventional radio communications such as HF or LOS. All links in a network use the same satellite transponder. Each of the users must carefully configure their link with reference to other users and keep uplink power within an allotted level. Failure to follow these guidelines will have harmful consequences on all other users. The increase of power on one link improves the quality of that link but intermodulation products increase and cause interference on the other links. A large increase in power causes the downlink carriers on other links to be suppressed. Control of all links using the same satellite transponder is important. While the GMF controller is a major player in the operation, overall control is distributed among six activities. Those responsible for controlling the GMF/TACSAT communications resources are described in the following paragraphs.

a. The planner plans the action and provides the following information when establishing a communications link using a DSCS satellite:

- Types of terminals and locations.
- Connectivity of the network (for example, terrestrial, switchboard, and direct interface).
- Channel requirements.
- Duration of exercise.
- Priorities for individual links.
- Backup communications.

b. The GMF manager is responsible for managing the satellite resources allocated to the GMFSC. The manager combines all requests and coordinates any conflicting requirements by--

- Apportioning a share of the satellite resources to each requester.
- Designating uplink and downlink frequencies, transmit power levels, data rates, C/KT and bit error rates, link margins, and detailed equipment settings.
- Issuing orders for reconfiguring the system due to changing requirements.
- Maintaining logs of system and station failures, interference problems, and violations by the users.

- Interfacing with the DSCS controller to determine proper operation.

- Negotiating for extra power for the GMFSC users as the situations warrant.

c. The DSCS controller is responsible for the DSCS network. This encompasses all users including GMF terminals working a particular satellite. The DSCS controller--

- Closely coordinates with the GMF controller during start and antijamming procedures.

- Informs the GMF controller when violations occur on the GMFSC network.

- Links up with the GMF controller on the control orderwire.

d. The GMF controller operates under the direct supervision of the GMF manager. The controller operates and maintains the control and monitoring equipment. The GMF controller--

- Establishes a positive control with each terminal over the control orderwire.

- Starts communications links within parameters provided by the GMF manager.

- Monitors systems and link performance.

- Controls adjustments of links to satisfy performance requirements.

- Instructs violators to operate within assigned parameters and reports willful violations.

- Analyzes system and station malfunctions.

- Maintains orderwire link with GMF operators and DSCS controllers.

- Analyzes jamming signals and interference to determine corrective actions.

- Determines frequency compatibility when terminals are relocating.

- Assigns previously cleared frequencies to another user when interference in the network is present.

e. The TACSAT communications terminal operator interfaces directly with the GMF controller. The user or operator follows instructions and reports status and performance of the TACSAT communications terminal. The operator--

- Operates and maintains the TACSAT communications terminal.

- Follows the GMF controller's instructions and coordinates during link start for reconfiguration, and at the same time isolates system malfunctions.

- Monitors uplink power, downlink signal levels, and bit error rate (BER).

- Relocates TACSAT communications terminal on proper command.

- Notifies the GMF controller of the move time and new terminal location.

- Interfaces with technical control of the subscriber.

5-5. System Configuration

a. The GMFSCCC is deployed in a number of different system configurations depending on the mission and theater of operations. The simplest configuration is point-to-point, where the GMF controller monitors over two TACSAT communications terminals each used as a point. The slightly more complex network is the hub-spoke configuration. Each low capacity terminal becomes one of the spokes operating with either the AN/TSC-85( ) or AN/TSC-100A. The hybrid configuration deals with a number of hub-spoke configurations with the hubs communicating with each other as well as the spokes in their configuration. A DSCS terminal (a fixed station satellite communications facility called gateway) can replace a low capacity GMF terminal. In these configurations, the AN/MSQ-114 has an orderwire control link with all the TACSAT communications terminals and a monitor link to the satellite. The AN/MSQ-114 can communicate with a DSCS terminal via the terrestrial critical control circuit (TCCC) network using either an established terrestrial link or a communications circuit via the satellite. To make DSCS terminals compatible with GMFSC terminals, additional equipment must be included in the digital communications subsystem (DCSS) of the DSCS terminal. The GMF contingency rack 20 low rate initial production (LRIP) and GMF contingency rack 20A are single racks giving limited operational capabilities to the DSCS terminals in the GMF network. To enhance the capabilities, additional racks are added to produce the DSCS/GMF gateway racks. Included are encryption devices, antijamming modems, LRMs, and patch panels. The complement of racks is increased to six in this configuration.

b. The AN/MSQ-114 terminal consists of an environmentally controlled 34-foot semitrailer, two power generators, a 20-foot parabolic antenna, prime movers, and a shelter for maintenance and storage of spare parts. The AN/FSQ-124 consists of four electrical racks, a roll-around cart, and a control console in the facilities of the host terminal.

c. The AN/MSQ-114 antenna is a 20-foot parabolic antenna type AS-3199/TSC. It has a limited motion of ±l0° cross elevation and a full 90° in elevation. Antenna control can be from inside of the van or remote. The modes of operation provided are manual, acquisition, and auto-track. To acquire a satellite, the antenna must be implaced with the azimuth look angle very close to the bore sight of the feed system.

(1) The receive subsystem consists of redundant antenna mounted low noise amplifiers (LNAs) with 37-41 dB gain each and the down-converters. The receive signal is processed from the LNA to a power divider that provides an eight-way split. Two of the outputs from the divider are dedicated to the SAMS equipment. Five are connected to five down-converters. The eighth is reserved for future addition of a sixth down-converter.

(2) The down-converters are a double conversion type with a 70 MHz output. Frequency selection for the down-converters is accomplished by front panel controls or by a microprocessor in an associated orderwire modem in the remote mode. Three down-converters can feed the AJ/CM with a beacon/CCC signal, an acquisition signal, and a polling signal.

(3) The cesium beam standard, which is the principal part of the frequency generation subsystem, is also redundant. The on-line unit provides outputs of 5 MHz, and one pulse per second for precise timing to the AJ/CM and other units as needed.

(4) The transmit subsystem consists of up-converters, amplifiers/mixers, and power amplifiers (PAs). Redundancy is presented in the PA, high voltage power supply, and amplifier/mixer assemblies. The PA has a maximum power output of 500 watts with an adjustment range of 20 dB. Three up-converters are provided with a future development for a fourth. They accept a 70 MHz signal from the orderwire or AJ/CM modem. Through a conversion process, the transmit frequencies are presented to the intermediate power amplifier (IPA)/attenuator to be raised to a suitable power level for driving the PA.

d. The AN/FSQ-124 is a component of a DSCSOC which is collocated with a host earth terminal. The host earth terminal can be an AN/GSC-39, an AN/GSC-52, or an AN/FSC-78. The AN/FSQ-124 consists of a remote orderwire console and four equipment racks that contain up- and down-converters, SAMS, IPAs, and orderwire modems. The AN/FSQ-124 is operated and maintained by a specially trained operator who is one of the five individuals normally on shift in the DSCSOC.

5-6. Antijamming and ECCM Techniques

a. The AN/MSQ-114, acting as the NCT, has the AJ/CM (MD-1133) that belongs to a family of spread spectrum modem equipment designed to provide the GMFSC terminals with ECCM capability for operation in a stressed environment. The spread spectrum link provided by the AJ/CM is more difficult to jam. This signal can coexist with the FDMA links by sharing the same frequency spectrum and presenting the appearance of not even being there. This link may well be the last ditch signal available in a stressed environment.

b. The MD-1133 used in the AN/MSQ-114 consists of one chassis assembly, the NCU. The NCU has a control and bus logic which provides functional terminal modem organization, execution, and control. The NCU control processor directs external programmable up-/down-converter synthesizer frequency control. The NCU requires a precise frequency and time reference from an external cesium beam standard. Redundant frequency standards (HP5061A), which are part of the AN/MSQ-114, provide the required time and frequency references. The NCU provides buffering for time and frequency reference signals for computational and code use. Software is modularized to specific terminal operations and functions. Terminal tasks are modularly executed through combinations of software modules, operator control, and fixed microprocessor hardware logic. Network control and status functions are provided on the NCU front panel along with monitor test and fault isolation functions. The AJ/CM replaces the RT-1287 nonsecure FM orderwire. It operates as an orderwire between the NT in addition to its communication's function. In a jammed environment, the AJ/CM equipment provides the antenna tracking signal instead of normal communications tracking.

5-7. Data Entry

a. The SAMS element of the AN/MSQ-114 and the AN/FSQ-124 provides the data base for planning GMF resources. The SAMS also provides the monitor facilities for managing the GMFSC network. The SAMS supports the GMF controller in translating satellite communications (SATCOM) requirements into channel capacities, time schedules, transmitter power, RF frequency assignments, and modes of operation. The SAMS monitors and measures the technical performance of deployed GMF ground terminals. This allows missions to be accomplished with a minimum assignment of available RF power and bandwidth. It also helps determine compliance of GMF ground terminal with assignments.

b. Network management is done by the SAMS software which consists of various resource planning, measuring, calculating, and report generating programs. These programs present to the GMF controller a real-time description of the satellite downlink.

c. The major parameters to be measured and calculated include carrier-to-noise density (analog and digital signals received by the AN/MSQ-114 and AN/FSQ-124 terminals), operating noise temperature, and percentage of satellite power usage. Alarm conditions and statistical data are also presented to the controller as conditions dictate and/or as required. A real-time operating system controls the SAMS software modules and data bases.

d. The SAMS uses all of the hardware, under control of computer programs, to perform the following required functions:

- Plan GMF links.
- Monitor the GMF downlink spectrum.
- Produce summary reports.
- Interact with the operator through a user friendly man-machine interface.
- Maintain a large data base for use in the planning and monitoring function.
- Manage all operations.

e. The GMF controller makes SAMS data base entries which are directly related to the AN/MSQ-114 and the AN/FSQ-124 functions. These functions are monitoring and controlling the GMFSC networks. The information to be entered comes from the DCA planner and the GMF manager in the DSCS-GMF SAA. This information is entered into the SAMS data base via the keyboard or by prepared cassette tape(s). The following examples of an SAR, sample report 1 (Figure 5-5), and DSCS-GMF SAA, sample report 2 (Figure 5-6), are the worksheets from which data to be entered into the SAMS is taken. The SAR must be in accordance with Defense Communications Agency operations center (DCAOC) contingency/exercise plan. (All entries on these worksheets are fictitious although representative of actual data.)

SATELLITE ACCESS REQUEST

FROM: CDR, 152D SIG BN, FORT GORDON, GA
TO: RSSC CONUS WASHINGTON, DC//MOSC-RSS-CO//

PART 1 OF 1
BT
CLASSIFICATION:
SUBJECT: Request for GMF/SHF Satellite Access Authorization

1. LTC Smith/152d Sig Bn/AV xxx-xxxx

2. STORK/TRAINING

3. FROM: 051400Z Jan 87
   TO: 092200Z Mar 87

4. TYPE OF SERVICE:

   FOR AN/TSC-85 ( ) - VF, Composite Data rate 1176 kbps
   FOR AN/TSC-93 ( ) - VF, Composite Data rate 600 kbps
   FOR AN/TSC-93 ( ) - VF, Composite Data rate 600 kbps

5. MISSION PRIORITY: 6

6. TERMINAL TYPE, SIZE ANTENNA and TERMINAL ID:

   AN/TSC-85 ( ) - (8) - ALPHA 1
   AN/TSC-93 ( ) - (8) - ALPHA 2
   AN/TSC-93 ( ) - (8) - ALPHA 3

7. AN/TSC-85( )

   LOCATION: FORT GORDON
   TERMINAL ID: ALPHA 1
   LATITUDE: 33° 24′ 50″ N
   LONGITUDE: 82° 10′ 00″ W
   UTM: LG 915976
   POC: MSG JONES, AV xxx-xxxx

   AN/TSC-93( )

   LOCATION: HUNTER AFB
   TERMINAL ID: ALPHA 2
   LATITUDE: 32° 01′ 00″ N
   LONGITUDE: 81° 10′ 00″ W
   UTM: MF 843417
   POC: SFC WAYMIRE, AV xxx-xxxx

Figure 5-5. Sample SAR.

AN/TSC-93( )

LOCATION:	MACON
TERMINAL ID:	ALPHA 3
LATITUDE:	32° 49′ 05″ N
LONGITUDE:	83° 33′ 32″ W

UTM: KG 605337
POC: SFC PIAZZA, AV xxx-xxxx

8. HUB-SPOKE CONFIGURATION

AN/TSC-85( )	ID NO. ALPHA 1, HUB TERMINAL
AN/TSC-93( )	ID NO. ALPHA 2, SPOKE TERMINAL
AN/TSC-93( )	ID NO. ALPHA 3, SPOKE TERMINAL

No changes will be made during mission.

9. AN/TSC-85( ) ID NO. ALPHA 1, SERVICE ON 051400Z JAN 87
SERVICE OFF 092200Z MAR 87

AN/TSC-93( ) ID NO. ALPHA 2, SERVICE ON 051415Z JAN 87
SERVICE OFF 092145Z MAR 87

AN/TSC-93( ) ID NO. ALPHA 3, SERVICE ON 051430Z JAN 87
SERVICE OFF 092130Z MAR 87

10. AN/TSC-85 ( ) ID NO. ALPHA 1: LALMKAA, 12 CHANNELS, LALNKAA, 12 CHANNELS.
AN/TSC-93 ( ) ID NO. ALPHA 2: LALMKAA, 12 CHANNELS.
AN/TSC-93 ( ) ID NO. ALPHA 3: LALNKAA, 12 CHANNELS.

11. N/A

12. Coded (C) for all terminals.

13. QPSK for all terminals.

14. URDB number.

Figure 5-5. Sample SAR (continued).

CDR7THSIGCOMD FT RITCHIE MD//ASN-OP-OC//
CDR 152D SIG BN FT GORDON GA//ABC-S3//
CDRUSAISC SATCOMSTA CP ROBERTS CA
//ASNA-ORD-CR-MSQ/DSCSOC//
DCA PAC WHEELER AFB, HI//P316//

INFO DCAOC WASHDC//N210.4/N240/B440//
CDRUSAISC FT HUACHUCA AZ//AS-OPS-OO//
19991SS SUNNYVALE AFS CA//DSCSOC//
JFP USMCEB WASHINGTON DC//JFP-FM 046//
CUSA CE SVC OFC WASHDC//AS-OPS-CE-C//
JFMO PAC HONOLULU HI
JFMO KOREA SEOUL KS
JFMO JAPAN YOKOTA ABJA
JFMO PHIL SUBIC BAY RP
JFMO GUAM
DOD AFC WSMR NM//AS-OPS-CE-SS//
DOD AFC AZ FT HUACHUCA AZ
AFC WESTERN US PSF SAN FRANCISCO CA//AS-OPS-CE-SW//
OJCS WASHDC//C3SDO//
USCINCPAC HONOLULU HI//CS3TM16//
CDR7THSIGCOMD FT RITCHIE MD//COC//GMF//

CLASSIFICATION

SUBJ: GMFSCS ACCESS ASSIGNMENT MISSION 869-87 (U)

A. MSG, 1523D SIG BN, ABC-S-3 (U) SUBJ: REQUEST FOR GMF/SHF SATL ACCESS (U) NOTAL.

1. (X) REF A IS A REQUEST FOR SATL ACCESS IN SUPPORT OF OMEGA/TRAINING.

2. (X) ACCESS IS AUTHORIZED ON THE 9443 WEST PAC SATELLITE (BEACON FREQ 7675.1 MHZ) FROM 101300Z THRU 202359Z MAY 87 PROVIDING THE USER OBTAINS FREQUENCY CLEARANCE FROM THE LOCAL BASE/POST AND AREA FREQUENCY COORDINATOR WHERE APPROPRIATE FOR EACH TERMINAL LOCATION TMLS WILL BE OPERATIONAL 24 HOURS DAILY.

3. (U) THIS MSG CONFIRMS AND DOCUMENTS SATL ACCESS REQUEST AND PROVIDES OPERATIONAL AND CONTROL INSTRUCTIONS. THIS IS A PRIORITY ____ MISSION USING ____ PERCENT OF CHANNEL ____ POWER.

4. (X) THE CONFIG FOR THIS MSN IS AN AN/TSC-85 ( ) ____ CHANNEL QPSK-CODED HUB (TML INDIA) LOCATED AT ____ WITH FOUR SPOKES, AN AN/TSC-93 ( ) ____ CHANNEL SPOKE (TML JULIET) LOCATED AT ____, AN AN/TSC-93 ( ) ____ CHANNEL SPOKE (TML KILO) LOCATED AT ____, AN AN/TSC-93 ( ) ____ CHANNEL SPOKE (TML LIMA) LOCATED AT ____, AND AN/TSC-85 ( ) ____ CHANNEL SPOKE (TML MIKE) LOCATED AT ____.

Figure 5-6. Sample SAA.

5. (U) THE CP ROBERTS AN/MSQ-114 WILL PROVIDE PRIMARY SATL ACCESS AND REAL TIME CONTROL FUNCTIONS. TML NAMES INDIA, JULIET, KILO, LIMA, AND MIKE, WHEN SEPARATED FROM GEOGRAPHICAL LOCATIONS, ARE UNCLASSIFIED.

6. (U) 30 MIN PRIOR TO SATL ACCESS TIME THE GMF TERMINALS WILL ACQUIRE THE SATELLITE AND MONITOR THEIR RECEIVE ORDERWIRE FREQ FOR ACCESS INSTRUCTIONS FROM THE GMF CONTROLLER. THE MSQ-114 FM ORDERWIRE TO TML INDIA (HUB) WILL BE ESTABLISHED ON THE RECEIVE FREQ FROM TML JULIET (REF PARA 8 SUB PARA A 2). THE GMF TMLS WILL CONTACT THE GMF CONTROLLER VIA ORDERWIRE WHEN DEGRADATION OCCURS DURING OPS AND WHEN ENDING SATELLITE ACCESS. IF UNABLE TO ESTABLISH ORDERWIRE CONTACT WITHIN 20 MINS, THE NETWORK TMLS WILL CONTACT THE CONTROLLER VIA AUTOVON 312 629-1680 OR COMMERCIAL/FTS 805 238-5056.

7. THE FM ORDERWIRE WILL BE USED FOR CRITICAL CONTROL COMMUNICATION BETWEEN ALL CMF TERMINALS AND THE AN/MSQ-114 CONTROLLER. IF THE FM ORDERWIRE IS NOT OPERATIONAL WITH THE CONTROLLER, THE CONTROLLER AND USER SHOULD USE ANY ALTERNATE MEANS AVAILABLE TO MAINTAIN CONTACT. LACK OF A POSITIVE MEANS OF CONTROL WILL RESULT IN DENIAL OR TERMINATION OF ACCESS.

8. (X) THE FOL OPERATIONAL CRITERIA ARE ESTABLISHED FOR THIS MSN:

A. TML INDIA, UNCLAS NAME LAT LONG (HUB)

(1) TRANSMIT FREQ ____ SAW LT 4
(2) RECEIVE FREQ FM TML JULIET ____ SAW FLT 1
(3) RECEIVE FREQ FM TML KILO ____ SAW FLT 1
(4) RECEIVE FREQ FM TML LIMA ____ SAW FLT 1
(5) RECEIVE FREQ FM TML MIKE ____ SAW FLT 1
(6) TRANSMIT POWER ____ WATTS
(7) DATA RATE ____ KBPS, ____ CH QPSK-CODED
(8) AZIMUTH ____ DEGREES MAGNETIC
(9) ELEVATION ____ DEGREES

B. TML JULIET, UNCLAS NAME LAT LONG (SPOKE)

(1) TRANSMIT FREQ ____ SAW FLT 1
(2) RECEIVE FREQ FM TNL INDIA ____ SAW FLT 4
(3) TRANSMIT POWER ____ WATTS
(4) DATA RATE ____ KBPS, ____ CH QPSK-CODED
(5) AZIMUTH ____ DEGREES MAGNETIC
(6) ELEVATION ____ DEGREES

Figure 5-6. Sample SAA (continued).

C. TML KILO, UNCLAS NAME LAT LONG (SPOKE)

(1) TRANSMIT FREQ _____ SAW FLT 1
(2) RECEIVE FREQ FM TML INDIA _____ SAW FLT 4
(3) TRANSMIT POWER _____ WATTS
(4) DATA RATE _____ KBPS, _____ CH QPSK-CODED
(5) AZIMUTH _____ DEGREES MAGNETIC
(6) ELEVATION _____ DEGREES

D. TML LIMA, UNCLAS NAME LAT LONG (SPOKE)

(1) TRANSMIT FREQ _____ SAW FLT 1
(2) RECEIVE FREQ FM TML INDIA _____ SAW FLT 4
(3) TRANSMIT POWER _____ WATTS
(4) DATA RATE _____ KBPS, _____ CH QPSK-CODED
(5) AZIMUTH _____ DEGREES MAGNETIC
(6) ELEVATION _____ DEGREES

E. TML MIKE, UNCLAS NAME LAT LONG (SPOKE)

(1) TRANSMIT FREQ _____ SAW FLT 1
(2) RECEIVE FREQ FM TML INDIA _____ SAW FLT 4
(3) TRANSMIT POWER _____ WATTS
(4) DATA RATE _____ KBPS, _____ CH QPSK-CODED
(5) AZIMUTH _____ DEGREES MAGNETIC
(6) ELEVATION _____ DEGREES

9. (U) 24HR POC IS THE GMF MANAGER AUTOVON 277-5606 5105. SECURE WB DROP 2137.
DECLAS: OADR

Figure 5-6. Sample SAA (continued).