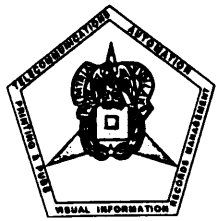
FORT HOOD PAMPHLET 25-11

MOBILE SUBSCRIBER EQUIPMENT OVERVIEW

A USER'S GUIDE TO THE TACTICAL TELECOMMUNICATIONS SYSTEMS

JULY 1994



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Information Management: Telecommunications

MOBILE SUBSCRIBER EQUIPMENT OVERVIEW

HISTORY. This is the first printing of this pamphlet.

SUMMARY. This pamphlet provides user information on the Mobile Subscriber Equipment (MSE) communications network. It also provides instructions on how to use the most common equipment over MSE.

APPLICABILITY. This pamphlet applies to all users of the III Corps MSE communications equipment.

INTERIM CHANGES. Interim changes to this pamphlet are not official unless they are authenticated by the Directorate of Information Management (DOIM). Users will destroy interim changes on their expiration date unless sooner superceded or rescinded.

SUGGESTED IMPROVEMENTS. The proponent of this pamphlet is the ACofS, G6. Users are invited to send comments and suggested improvements to the Commander, III Corps and Fort Hood, ATTN: AFZF-CE-CD, Fort Hood, TX 76544-5056.

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following procedure for verification of an individual LAN cable section.

(1) Make a visual inspection of the entire cable section for possible breaks or kinks in the cable section. Make certain both connectors are securely attached to the cable section.

(2) If you are familiar with ohmmeters and one is available, you may conduct the following test:

(a) Disconnect the LAN cable from any computers.

(b) Disconnect the terminators from the TCP/AC. For each terminator, measure the resistance of the terminator between the center conductor and the metallic outer part of the terminator. The resistance should be between 48 and 52 ohms. If the measurement falls outside the acceptable range, replace the terminator.

(c) To check the LAN cable section, attach a terminator to one end of the LAN cable section. At the free end of the cable section, measure the resistance between the center conductor and the shield conductor of the LAN cable. This will measure the resistance of the LAN cable plus the resistance of the terminator at the far end of the cable. The resistance should be between 48 ohms and 62 ohms. If the measurement falls outside the acceptable range, your cable section is defective.

MOBILE SUBSCRIBER EQUIPMENT OVERVIEW

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c. G6 HELP. Dial the G6 representative at either the Corps TAC, MAIN, or REAR.

3. COMMON TYPES OF MSE VOICE TELEPHONES.

a. DIGITAL NONSECURE VOICE TERMINAL (DNVT) (Figure 2). This telephone provides normal voice service in the MSE net. All traffic within the MSE network is protected to the SECRET Level.

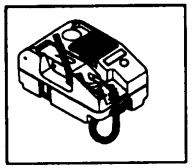


Figure 2 - DNVT

b. DIGITAL SUBSCRIBER VOICE TERMINAL (DSVT) or KY-68 (Figure 3). This telephone provides additional security for those individuals who need it and is commonly found as part of the Maneuver Control System (MCS) or the MSE mobile terminal. Prior to affiliation or use, this type of phone must be "filled" with TWO electronic COMSEC keys: the "M" key, a common key across the corps, and the "U" key which is different for different types of subscribers. You must have the correct "M" and "U" keys to use the phone. If you borrow the wrong key, your phone will not work. Check with your Signal Officer to obtain the correct COMSEC keys.

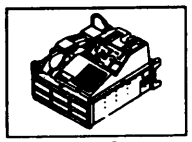


Figure 3 - DSVT

c. MOBILE SUBSCRIBER RADIO TERMINAL (MSRT) or VRC-97. The MSRT is MSE's version of a cellular telephone. It is basically a DSVT connected to a radio (called an RT-1539). MSRTs enter the MSE network through equipment called a Radio Access Unit (RAU). RAUs are interspersed across the MSE backbone to cover as much territory as possible. In addition to loading TWO keys in the DSVT portion of the mobile subscriber radio terminal (see above), you must also load an "M" key into the radio. The radio must also be filled with an electronic "FREQUENCY PLAN" which tells the radio which frequencies to transmit and receive on. Current frequency plans can be obtained from your Signal Officer - or by driving to the nearest RAU.

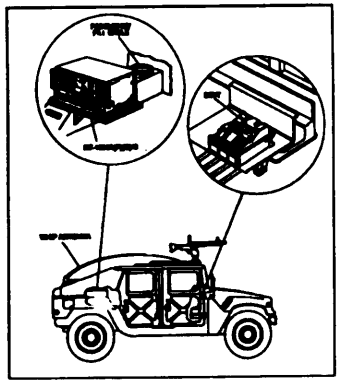


Figure 4 - MSRT

4. MSE TONES. MSE uses various tones to communicate what it is doing to the user. It is difficult to portray in writing how

(14) Disk ON LINE indicator not lit or blinking.

- No power to disk drive.

(15) Tape BUSY and FAULT indicators do not light then go out.

- Tape drive turned off.

(16) CPU POWER indicator not lit.

- Check CPU power cables.

- Check CPU POWER indicator light.

(17) Activity indicator light on flexible drive does not light.

- Flexible disk drive turned off.

- No power to monitor.

b. LAN TROUBLESHOOTING.

- The LAN must have 50-ohm terminators at each end.

- The MCS LAN must be grounded at only one point in any LAN configuration. This is done from a LAN terminator plug to a ground point.

- Sections may be joined by barrel connectors. Each connection may be 150 feet (45 meters), as issued, or shorter.

- A network can have a maximum of 600 feet or 185 meters of cable total.

- A maximum of up to 31 devices can be on one 600-foot (185-meter) LAN.

- The minimum LAN cable length is 1.62 feet or 0.5 meters.

- Don't cut the LAN cable into lengths that are multiples of 5 meters (16.4 feet).

- Don't configure LAN cable segments in a closed loop or have any branch segments.

If messages abort when transmitted to another (second) MCS device on the LAN, possible causes include:

(1) The second device is turned off. Solution: Make sure the second device is turned on.

(2) The nodal address is incorrect. Solution: Verify your SYSTEM INITIALIZATION and request verification of the distant node's SYSTEM INITIALIZATION.

(3) The LAN system at your device or the second device is defective. Solution: Follow these steps on each device:

(a) Select the SYSTEM INIT FFK.

(b) Select the LAN REINIT VFK. System alert LAN HW BEING REINITIALIZED should appear.

(c) Clear the alert. If system alert LAN HW REINIT SUCCESSFUL appears, LAN is okay. If system alert LAN HW MISSING OR FAILED appears, either your device is defective or the LAN has been disrupted.

(d) To check your device, disconnect the LAN cables and connect a terminator to each of the LAN connectors.

(e) Select the LAN REINIT VFK. System alert LAN HW BEING REINITIALIZED should appear.

(f) Clear the alert. If system alert LAN HW REINIT SUCCESSFUL appears, your device is okay. If system alert LAN HW MISSING OR FAILED appears, the LAN has been disrupted. Continue with the following.

(4) The LAN has been disrupted. Solution: Follow these steps:

(a) Starting with a known good device at one of the terminated ends of the LAN segment, add devices one at a time to the LAN (terminate the LAN at the added device each time).

(b) Transmit a message from the device at one end of the LAN to the device just added.

(c) If the message aborts, the last added device or cable is faulty. To check the cable, follow the directions in the LAN Cable Section/Troubleshooting Section. To check the TCP or AC, follow the directions in #3 above for that device. After the fault has been isolated to a single cable section, use the

1. MSE NETWORK OVERVIEW.

a. AN AREA COMMUNICATIONS SYSTEM (Figure 1). Mobile Subscriber Equipment (MSE) is an area communications system. This system consists of a backbone network of electronic switching centers (called node centers) into which local switchboards are connected. These local switchboards provide customers telephone service and are called Large Extension Nodes (LENs) and Small Extension Nodes (SENs).

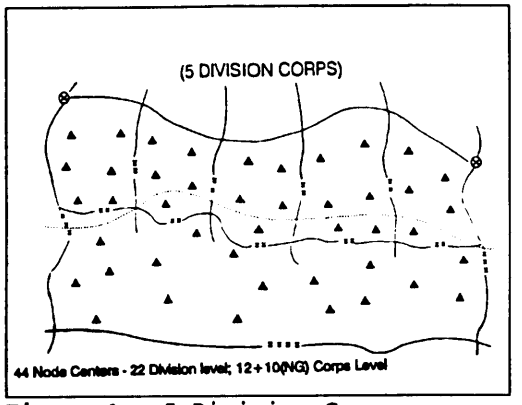


Figure 1 - 5 Division Corps MSE Network

b. TELEPHONE NUMBERS AND TELEPHONES. Telephone numbers in MSE are not associated with telephones, but rather individual people or organizations. Any telephone can be assigned or "affiliated" with any telephone number. (There are restrictions here - some telephone numbers can be used only with secure telephones. See your Signal Officer for details.) Instructions on how to affiliate and disaffiliate your telephone are summarized below. Once you affiliate with a telephone, the system routes all your calls to that telephone.

c. USER RESPONSIBILITIES. The use of MSE requires each user to fully understand how to hook a telephone up, log the telephone into/out of service (affiliate/ disaffiliate), complete call, and do basic troubleshooting. The information in this directory outlines the direct dial capabilities of the MSE system which resemble those of a commercial telephone company. Any changes or additions to the tactical telephone directory should be directed to the Corps G6 at 458-4322.

2. TELEPHONE ASSISTANCE. Persons experiencing telephone difficulties that cannot be resolved after following instructions in this pamphlet can gain assistance by:

a. OPERATOR ASSISTANCE. Dialing 0 for the MSE operator.

b. HELP DESK. Dial telephone assistance at 458-9011.

a. LAYING THE WIRE (WF-16). Lay WF-16 field wire from J-1077 Junction Box or Remote Multiplexer Combiner to your telephone. Leave several feet of slack in the line. At each end tie a loop of the wire around a stationary object - this prevents damage to the equipment should someone trip over or unexpectedly pull the line. TAG BOTH ENDS OF THE LINE with wire tags using the following format:

UNIT: III CORPS G3
SUBSCRIBER: G3 PLANS SEC
TEL #: 2603340
SWITCH: L07 This is the switchboard designator which appears on the Junction Box.

b. CONNECTING WIRE TO J-1077 or RMC. Connect the WF-16 field wire to either a J-1077 Junction Box or a Remote Multiplexer Combiner (RMC).

(1) J-1077, JUNCTION BOX. (Figure 5)

(a) GREEN wires will be used to TRANSMIT and will always be connected to the top or ODD numbered pair of the quad (i.e., 1, 3, 5, 7, etc.).

(b) BROWN wires will be used to RECEIVE, and will always be connected to the bottom or EVEN numbered pair of the quad (i.e., 2, 4, 6, 8, etc.).

(2) REMOTE MULTIPLEXER COMBINER (RMC) (Figure 6)

(a) GREEN wires will be used to TRANSMIT, and will always be connected to the Right or IN pair of the quad, which is labeled "CHAN 1, 2, 3, 4, 5, 6, 7, 8".

(b) BROWN wires will be used to RECEIVE, and will always be connected to the Left or OUT pair of the quad, which is labeled "CHAN 1, 2, 3, 4, 5, 6, 7, 8".

c. CONNECTING WIRE TO TELEPHONE. Connect the WF-16 field wire to the DNVT or DSVT.

CAUTION Ensure that the bare ends of the wires do not touch each other or yourself. A potential of 56 Volts DC is present on the line.

LEGEND:
DIAL TONE: Tone normally heard by affiliated subscribers when off hook. If number is not dialed within ten seconds, a busy tone is heard.
ERROR TONE: Medium oscillating tone.
DSVT RING: Indicates general alarm, must be on hook.
ASTERISK (*): Not significant in identifying incident.
FL: Flashing
BLACKLISTED: On MSRT occurs after 5 unsuccessful attempts to reaffiliate. Wrong PC used during reaffiliation.

18. MCS TROUBLESHOOTING.

a. GENERAL TROUBLESHOOTING. Possible problems and suggested solutions.

(1) No power to one or more components.

- Power switch is not turned on.

- Cables are loose, dirty, broken, or not connected.

- PCU power switch and/or circuit breaker not on.

- Power source not connected to PCU.

- Bad fuse.

(2) Printer, disk, tape, PCIU not responding.

- Cable connector pins may be bent or crushed.

(3) No display on monitor.

- Monitor not turned on.

- Brightness and contrast improperly adjusted.

(4) Missing dots on printed material.

- Print head dirty. Clean print head.

- Printer cable not tight. Ensure cable connections are tight at both ends.

- Print head defective. Remove print head cartridge and install new one.

(5) Print is too light.

- Print head cartridge running out of ink. Remove print head cartridge and install new one.

- Incorrect paper loaded. Remove paper and install correct type. The standard print cartridge requires Hewlett Packard "JetPaper" for best print quality. There is a plain paper cartridge which will print on plain tractor-feed computer paper.

(6) Printer will not advance paper.

- Paper path jammed or paper feeder holes torn. Remove paper and install correctly.

(7) Improper paper advance.

- Improper pin wheel engagement. Remove paper and install correctly.

(8) Printer indicator not lit.

- Printer turned off.

- Power cable loose. Check power cable.

- No power to printer.

- Check fuse. If fuse is burned out, remove and install a new fuse.

(10) Print head jammed.

- Paper or other foreign object blocking print head path. Turn printer off and remove foreign object.

(11) Large spot of ink on page.

- Print head carriage did not return to home position. Turn printer off then back on. Printer head carriage should return to home position.

(12) Power indicator not lit on PCIU.

- PCIU turned off.

- No power on PCIU.

(13) Disk FAULT indicator did not light then go out.

- Disk drive turned off.

these sound, but the section below provides a brief description of each.

a. DIAL TONE. This is a steady mid-pitch tone. The system is ready for you to dial a number.

b. WAIT TONE. This is a steady low-pitch tone. The system is processing your call or searching for the subscriber you dialed. Sometimes this can go on for 30 seconds or more.

c. RING BACK TONE. This sounds similar to a ring tone on commercial systems, but the pitch is the same as a dial tone. It indicates the dialed phone is ringing.

d. BUSY TONE. This sounds like a normal busy signal, but the pitch is also the same as the dial tone.

e. ERROR TONE. This is a series of rapidly alternating high and low pitch tones. It indicates either your phone is not affiliated, or that a problem was encountered completing your call.

f. NONSECURE WARNING TONE. This is a high pitch 1/2 second tone or click heard every 6 seconds when one of the subscribers is calling from a nonsecure terminal, such as a commercial phone interfaced to the MSE system. Discuss only unclassified information when this tone is heard.

g. PREEMPT TONE. (DNVT ONLY) This is a dual pitched tone that lasts from 1 to 3 seconds. It indicates your call has been preempted. You should re-initiate the call.

h. CALL FORWARDING TONE. This is a high pitch continuous tone that is heard for 10 seconds after the subscriber enters "2C + DIR number" on the telephone keypad to initiate call forwarding (See the subscriber features section for a description of call forwarding). The subscriber can still make outgoing calls, and will hear call forwarding tone when off hook. After entering "2C + DIR number" for telephones off a SEN, you will receive a busy error tone. The subscriber can still make outgoing calls off a SEN and a RAU, and will hear dial tone when off hook.

i. CONFERENCE DISCONNECT TONE. This is a 1 second continuous tone heard when a conference is being disconnected.

5. TELEPHONE INSTALLATION INSTRUCTIONS (DNVT/DSVT).

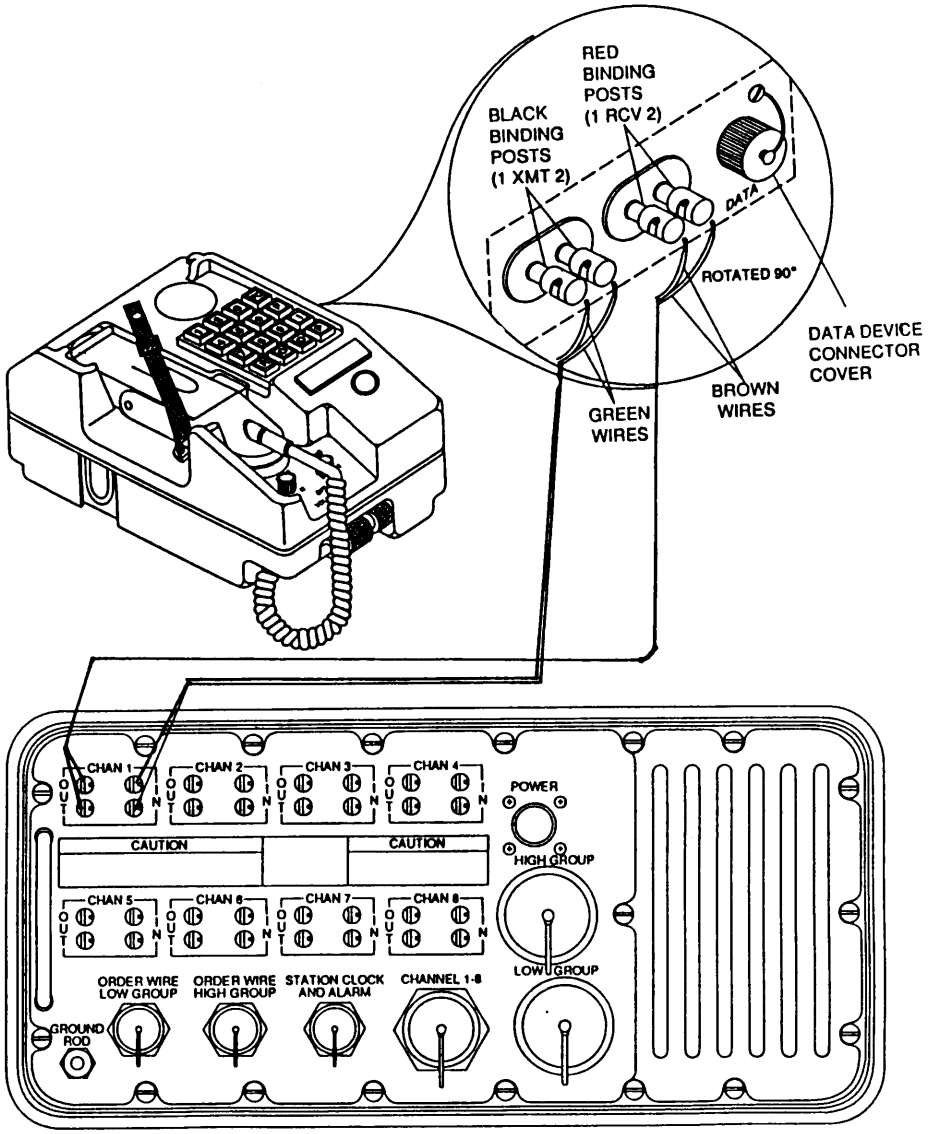


Figure 6 - Connections to RMC

Signal Officer to ensure that communications are up and ready for MCS to re-initialize the MPN software.

(6) For all of the above: If the MSE Packet Network cannot be established or re-established, you should switch to the Standard LAN configuration to continue operations within the local CP.

16. DSVT TROUBLESHOOTING.

a. PLACE A VOICE CALL. If the voice call is not successful, proceed as follows:

(1) Make certain the DSVT function switch is in the "OP" position.

(2) Center the variable storage switch.

(3) Check the fill battery for proper installation and charge.

(4) Make certain the COMSEC keys are loaded (see DSVT COMSEC troubleshooting procedures).

(5) If sound is not heard in the headset and the lamps on the top of the phone do not come on when the handset is lifted, the wireline from the phone to the switchboard is out. Check the wireline connectors, both at the DSVT and at the junction box.

(6) Check the wireline for shorts/breaks.

(7) If the dial tone is not heard, the DSVT is not affiliated. If unable to affiliate, call the MSE switch operator.

b. FOR MCS OPERATIONS. If the voice call is successful, also check the following:

(1) Check the DSVT-TCP cable connection.

(2) Check the MCS channel code and, if necessary, reconfigure the channel.

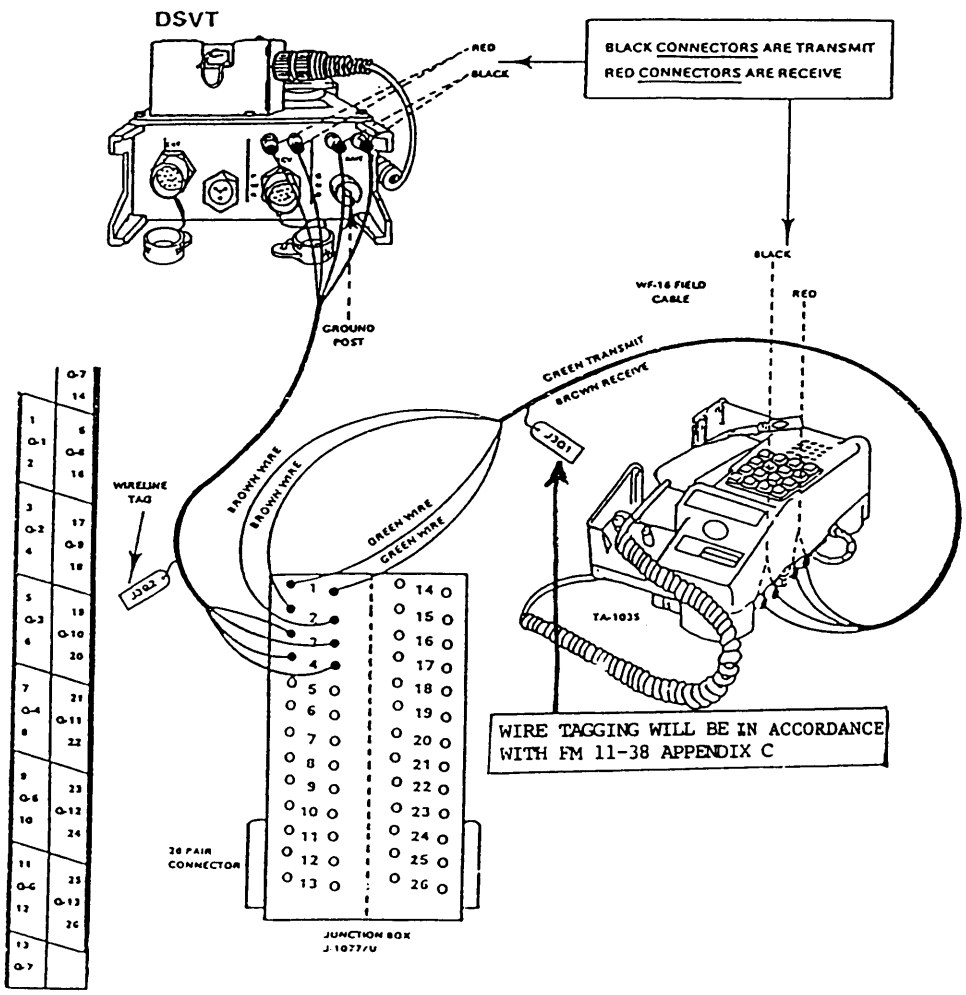
(3) Verify that phone numbers and nodal addresses are correct.

(4) Call the MSE "help" number and verify the voice and data profile.

17. MSRT TROUBLESHOOTING. Please refer to the chart below.

INCIDENT/CORRECTIVE ACTION	RT 1539 INDIACATOR STATUS						
	FREQ PLAN	LOADED DIR NO	LOADED CRYPTO ALARM	ALARM	AFFILIATED	SCANNING	TONE
While attempting to affiliate:							
Used wrong Personal Code (PC). Go on hook, then off hook (error tone in response to affiliation). Verify code and retry.	ON	FL	OFF	OFF	OFF	•	ERROR
Unable to find RAU or Saturation. Reset RT-1539 (turn off, then on within 3 seconds to change Virtual Frequency Plan).	FL	ON	OFF	OFF	OFF	FL	ERROR
M Key Mismatch. Reset RT-1539 (turn off, then on within 3 sec) Reenter PC + DIR NO. If unsuccessful, reload M Key.	ON	ON	FL	OFF	FL	FL	ERROR
Number refused. (Not preaffiliated/ lost). Dial "0" so operator can connect you to trouble number.	ON	ON	OFF	OFF	OFF	ON for 17 SEC, then FL	ERROR
Blacklisted. Contact operator to clear, then reload M Key. Reenter PC + DIR NO.	ON	FL	OFF	•	FL	FL	ERROR
Problem external to radio (while in use or performing BIT). Check radio connections, cable, antenna, DSVT. If unsuccessful, contact maintenance.	ON	•	•	FL	•	OFF	DSVT MAY RING
RAU Presaturated. (Subscriber Affiliated). Only Priority subscribers may place calls. Disaffiliate and attempt reaffiliation.	ON	ON	OFF	OFF	FL	FL	DIAL TONE
Outside RAU Coverage. Wait 3 minutes for radio to reaffiliate. If unsuccessful, move to new location.	ON	ON	OFF	OFF	OFF	FL	ERROR
Low DC Power. Start vehicle to recharge battery.	•	•	•	ON	•	•	DSVT RING

(Legend on next page)



(3) Connect the fill device (usually a KYK-13 or KYX-15. Your COMSEC custodian will have this.) and select the position containing the proper U key. YOU MUST LOAD THE "U" KEY BEFORE LOADING THE "M" KEY.

(4) Set the DSVT "Function Sel" switch to "LDU".

(5) Move the DSVT "VAR/STOR" switch to "Load" (you should hear a short tone) and release it (you should hear the tone again).

(6) Select the position on the fill device containing the proper M key.

(7) Set the DSVT "Function Sel" switch to "LDX".

(8) Again, move the DSVT "VAR/STOR" switch to "Load" (you should hear a short tone) and release it (you should hear the tone again).

(9) Disconnect the fill device.

(10) Set the DSVT "Function Sel" switch to "OP".

(11) Affiliate. On a wire-line DSVT, you can now affiliate the phone (see paragraph 7).

6. MSRT INSTALLATION INSTRUCTIONS.

a. LOAD COMSEC INTO THE DSVT using the steps above.

b. LOAD COMSEC INTO THE RADIO (RT-1539) following these steps:

(1) Connect the fill device to the "fill" connector "J3" on the radio (RT-1539).

(2) Select the position on the fill device containing the proper M key.

(3) Push the RT-1539 "Fill/Zero" switch up four (and only four) times in rapid succession. The "Crypto Alarm" light should go out.

(4) Disconnect the fill device.

c. LOAD THE FREQUENCY PLAN into the radio following these steps:

(If the ping is successful, the following will be displayed on the screen:

10 packets transmitted, 10 packets received, 0% packet loss
round-trip (ms) min/ave/max = 3/3/7

If unsuccessful, the following will be displayed:

Example:

----(nodal address) Ping Statistics---
10 packets transmitted, 0 packets received, 100% loss

(3) Select LAN or MPN comm: This function allows the operator to switch back and forth between the Packet LAN and the Standard MCS LAN without going out of MCS.

(a) Select "D" for the LAN switching function. The prompt "Do you wish to use the Packet Network? (Y or N)" appears. Select "Y" or "N" as appropriate and the LAN will reconfigure to your selection.

(b) Return to the Sys Init screen, "F4". Ensure that channel 4 is open and channel 5 is either blank or closed. Select the "Reinit the LAN" VFK.

(4) Date/Time Synchronization Utility: This function allows operators to synchronize the system clock with the clock of another MCS terminal.

(a) Select "D" for synchronization function. The prompt "Select Host Name of the Master Date/Time Source MCS Terminal: (host name)." Pressing any numbered or letter key will open a window in the lower right corner of the screen with all of the available destinations. All destinations that are registered in the Packet Network will be displayed in the window. The window will only show several destinations at a time, so you will have to scroll through the window using the arrow keys to highlight the destination desired. Highlight the desired destination and press "Return".

(b) Press "F1" to start the process. Notice the message working...synchronizing...". Upon completion a message will be displayed telling you the new Date/Time.

(5) View MPN File Transfer Log: This function will display the file transfer log. Select "V" to view the File

Transfer Log. The name of the file received, the nodal address, and the date/time received will be displayed.

(6) Clear MPN File Transfer Log: This function will clear the file transfer log.

(a) Select "C" and "Return" to clear the message log.

(b) The message log may be restored by selecting "V" before any new file transfers are received. If a new file is received before pressing "V", the message log will be lost.

h. NOTES AND TROUBLESHOOTING MPN.

(1) MCS terminals not up on the MSE Packet Network (MPN) will not be able to receive messages from those terminals that are on the packet. If a message is sent to a terminal that is not on packet, the sender's message will be aborted and an alarm will appear on the sender's terminal. Once the destination terminal comes up on the Packet Network, you can establish communications.

(2) If a "MPN Closed - No IGW" message is observed in the bottom left corner of the screen when trying to initialize the Packet Network, check the LAN connections to ensure they are properly connected and/or check with the SEN/LEN to ensure that communications are up and ready for MCS to initialize the MPN software.

(3) If a "MPN Closed - TNS failed" message is observed in the bottom left corner of the screen when trying to initialize the Packet Network, check the LAN connections to ensure they are properly connected and/or check with the SEN, LEN or Signal Officer to ensure that the communications are up and ready for MCS to initialize the MPN software.

(4) If the MSE Packet Network goes off-line, the software will automatically try to re-establish the MCS terminal back on the Packet Network. Several messages will be observed along the bottom of the screen. "MPN Refresh Error" notifies you that comms may be down or the LAN is broken. Then the software will automatically try to re-establish the link and the "Trying TNS - Pleas Wait" message will be displayed. If successful, the "MPN Open" message will be displayed and operations are restored. If unsuccessful, the "MPN Closed" will be displayed.

(5) If a "MPN Closed" message is observed in the bottom left corner of the screen, check the LAN connections to ensure they are properly connected and/or check with the SEN, LEN, or

(1) When using a DR-8 reel of WF-16 field wire, don't cut the wire. Roll the reel from the J-1077 or RMC to the phone. Then use a small strip of wire from the reel of WF-16 to connect it to the telephone. This method allows you to avoid continuously cutting and splicing wire on the reel every time you install the phone.

(2) Connect GREEN wires to the transmit (XMT) binding posts (BLACK) on the DNVT or DSVT.

(3) Connect BROWN wires to the receive (REC) binding posts (RED) on the DNVT or DSVT.

(4) Pick up the handset (Go off hook).

(5) Error tone will be heard in the handset. If no tone is heard then:

(a) Verify correct wire connections on DNVT/DSVT and J-1077/RMC.

(b) Adjust audio volume control knob.

(c) Verify that the switchboard (Small or Large Extension Node) which is providing you service is operational.

(d) If there still isn't a tone, use another quad on the J-1077 or RMC (if available).

(e) Verify the condition of the wire, replace the wire if it is cut or spliced.

(6) Affiliate. If you hear error tone on a DNVT, you can now affiliate the telephone (See paragraph 7). If you are using a DSVT you must still load the COMSEC into the telephone before affiliating.

d. LOADING COMSEC INTO THE DSVT (KY-68). The DSVT must be loaded with the proper "M" and "U" COMSEC keys prior to use. U keys are different for different users (based upon your subscriber profile). Ensure you have the correct U key before attempting to load the DSVT. Then follow these steps:

(1) Ensure the handset is securely in its cradle.

(2) Move the DSVT "VAR/STOR" switch to "ZERO" and then back to the center.

(FOR EXAMPLE, if your number is 220-1234, you would dial 8-R-220-220-1234 to affiliate your phone.)

DSVT users: The first time you pick up your phone, you may have to wait up to 20 seconds to get dial tone while the switchboard exchanges crypto information with your phone.

b. DISAFFILIATING. Disaffiliating erases the association between the phone you are using and your telephone number. Once you disaffiliate, both your number and the phone you are using become unassigned. To disaffiliate your phone, dial: 8-C-YYY-ZZZ-XXXX.

After dialing this sequence keep the handset off-hook. You will hear a wait tone followed by an error tone. At this point the phone has been disaffiliated.

(FOR EXAMPLE, if your phone number is 220-1234, you would dial 8-C-220-220-1234.)

YOU MUST DISAFFILIATE YOUR PHONE BEFORE TAKING IT OUT OF SERVICE (unhooking it). If you fail to do so, you may be unable to reaffiliate your number in the future (if this happens, call the operator).

8. DIALING ANOTHER SUBSCRIBER. First, ensure you have the correct phone number based on a current telephone directory. Numbers often change between exercises or operations. To dial a number:

a. GO OFF-HOOK, lift the receiver, wait for dial tone.

b. DIAL THE DIRECTORY NUMBER of desired party.

(AAA) ZZZ-XXXX

where:

(AAA) is the area code for subscribers in a different calling area. You do not need to dial an area code to reach subscribers who are in your area code. Generally, all subscribers in III Corps are in the same area code.

ZZZ-XXXX is the subscriber's 7-digit number.

NOTE A wait tone will probably be heard while the network is searching for the directory number.

c. THE CALL IS COMPLETED WHEN:

(a) Open IBP by holding down the "Shift" key and tapping the "Select" key.

(b) Select "1", Integrated Business Package. The Uniplex Main Menu will display on the screen.

(c) From the Uniplex Main Menu, Select "N", "MPN Services" and the following menu will be displayed:

M P N S E R V I C E S

File Transfer	Other Utilities
T - File Transfer	L - List Hosts in Local MPU domain
V - View MPN File Transfer	P - Ping Hosts
C - Clear MPN File Transfer Log	
	! - UNIX Shell
	Q - Quit

(d) From the MPN Services menu, select "T" to transfer files.

(e) The next prompt will ask "Select Host Name of Destination MCS Terminal". Pressing any numbered key or letter key will open a window in the lower right corner of the screen with all the available destinations. All destinations that are registered on the Packet Network will be contained in the window. You may have to scroll through the window using the arrow keys to find the destination desired. Highlight the desired destination and press "Return".

(f) The Nodal Address may be entered, if known, thus making the scrolling process unnecessary.

(g) On the same screen there is a second prompt, "Select Type of File Transfer". Select "IBP" or "DOS".

(h) Select "F1" to process.

(i) The next screen will prompt "Select File to Transfer". Pressing any numbered key or letter key will open a window in the lower right corner of the screen with all of the available files. Highlight the file to be transferred and press "Return".

(j) Once the desired file has been entered, select "F1" to process/transmit.

(k) Watch the screen and it will tell you if the file was received or not.

(2) Receiving IBP MPN File Transfers:

(a) When a file transfer is received the MCS machine will beep and the status message "New File Received" will appear in the lower right corner of the screen.

(b) Selecting "V" from the Network Services Main Menu will display the MPN File Transfer Log and list the name of the file received, the nodal address of the sender and the date/time received.

(3) Reading a Packet File Transfer: To view or edit a file transfer, follow the same procedures as opening a MCS wordprocessing or spreadsheet file.

g. MCS/MPN UTILITIES.

(1) Lists Hosts in local MPU domain: This function will list all of the destinations that are up on the MSE Packet Network.

(2) Ping Hosts: The most useful function under utilities will probably be the "Ping" function. This allows a terminal to find out if the destination terminal is up and operational. (The same as making a phone call to see if they are up only now it can be done electronically.)

(a) Select "P" for the Ping Host function. The prompt "Enter remote host name or IP address you wish to ping--?" will be displayed. Enter the nodal address of the destination you want to ping and press "Return".

(b) MCS will send an electronic check over the network to the nodal address you selected. The following will appear on the screen:

PING (nodal address): 64 byte packets, 10 packets

Then the following will appear on the screen 10 times if your MCS terminal is able to ping the nodal address you selected:

Example:

64 bytes from 170.170.166.149: icmp_seq.1 time=7. ms

(1) Connect a "fill cable" to the "Remote Control" connector (J4) of the radio to be loaded.

(2) Connect the other end of the "Fill cable" to one of the following:

(a) An operational RAU (ask the operator to show you where to connect it).

(b) The "Remote Control" connector (J4) of another RT-1539 that has the correct frequency plan.

(3) Lift the handset of the DSVT. Make sure the "Depress Lock" switch is rotated (counterclockwise) away from the "Lock" position and springs up.

(4) Dial 8-C-F-R-8-F-F-R.

(5) Wait for dial tone followed by error tone.

(6) The "Loaded Freq Plan" light should illuminate.

(7) Hang up the handset.

(8) Affiliate. You can now affiliate your MSRT (see paragraph 7).

7. AFFILIATION AND DISAFFILIATION.

a. AFFILIATING. When you pick up your phone for the first time, you will hear the error tone. This indicates the phone is not affiliated with a telephone number. You must affiliate the phone prior to attempting any calls with it. To affiliate your phone dial the following sequence:

8-R-YYY-ZZZ-XXXX

YYY is your PERSONAL CODE. In III Corps, this is normally the same as the first three digits (ZZZ) of your phone number. After you have entered the MSE network, you must use the same code any time you want to disaffiliate or reaffiliate your number with another telephone.

ZZZ-XXXX is your telephone number.

After dialing the affiliation sequence, hang up the receiver and WAIT FOR AT LEAST 20 SECONDS. The next time you pick up the phone, you should hear dial tone.

one-time basis even if you don't have this feature. A progressive conference call is initiated by keying in the sequence:

(a) [P] C [AAA] ZZZ-XXXX where:

P is an optional precedence,

C tells MSE you want to make a conference call,

[AAA] ZZZ-XXXX is the directory number for the first party you want to call.

(b) After the first party answers, tell them to standby for a conference call. Key "C" and wait for another dial tone.

(c) Dial the directory number for the second party in the conference.

(d) Repeat steps 2b and 2c for each subsequent party you want in the conference.

(e) As long as the originator of the call stays on the line, other parties can hang up without interrupting the conference. Once the originator of the call hangs up, the conference call will be terminated. If you are using precedence, only key it in on the first party called.

(2) PREPROGRAMMED CONFERENCES. MSE allows a very limited number of "preprogrammed" conference calls to be set up in advance. These are normally reserved for Division or Corps Commanders or G3s. Check the exercise directory to see which lists are available and who can initiate them. There can be up to 14 subscribers on a conference. To use this feature dial: [P] "6C" LL

- where [P] is an optional precedence

- 6C tells MSE you want to initiate a preprogrammed conference.

- LL is the two digit preprogrammed conference list number. Preprogrammed conference lists can be found in the exercise directory.

c. CALL FORWARDING. This service is similar to the call forwarding feature offered by commercial phone companies. To forward your phone, dial: "2C" [AAA] ZZZ-XXXX.

(3) If a message aborts over channel 4 (the Local Area Network channel), perform LAN Troubleshooting Procedures in the MCS Quick Reference Guide.

15. MCS ON THE MSE PACKET NETWORK (MPN)

a. CONNECT MCS TO MPN.

(1) Use the normal LAN cable. Connect one end of the cable to the packet network port on the SEN/LEN shelter.

(2) Connect the other end of the cable to the normal MCS channel 4 port. If there are other MCS terminals on the LAN, connect all of the terminals the same way as the normal MCS LAN (Daisy Chain). All open LAN ports must be capped with a 50 ohm terminator plug. One terminator plug in every individual LAN must be a ground plug.

b. POWER UP MCS DEVICES. The system is powered up in the same manner as you have always done in the past.

c. INITIALIZE MCS/MPN.

(1) Bring the system to the MCS Main Menu. Select number "1", "Maneuver Control System".

(2) Answer the PCIU prompt for your machine configuration "Do you wish to use the PCIU (Y or N)?" (NOTE: AC's will not have this prompt and will have only the prompt in paragraph 3c).

(3) Notice the next question: "Do you wish to use the Packet Network?" Select "Y" to use the Packet Network.

(a) After selecting the Packet Network there will be a yellow status message "Trying IGW - Please Wait" in the bottom left corner of the screen.

(b) Once the trying IGW function is complete there will be a green status message "XX NNN.NN.HHH.SSS" in the center of the screen. This message identifies the unique Host Name and Internet Protocol (IP) Address given to the MCS terminal. XX NNN.NN.HHH.SSS means the following:

XX = two digit nodal address
NNN.NN = MSE Network ID
HHH = MCS Host Terminal ID
SSS = MSE Packet Switch ID

(c) You will next see a status message "Trying TNS - Please Wait".

(d) Once the TNS function is completed there will be a green status message "MPN Open" in the bottom left corner of the screen.

(e) From the System Init Page select the "Channel Status" VFK and ensure that channel 4 is "open" and channel 5 is "closed". If not configure channel 4 and close channel 5.

d. SETUP DESTINATION TERMINAL PAGE. Setup the Destination Terminal Page for MSE Packet Network communications.

(1) The Destination Terminal Page is set up the same as the normal MCS channel 4 configuration, i.e., Unit ID "ZZ 1ID DMAIN G3 OPS", Destination Nodal Address "ZZ", Channel "4", Destination Nodal Address "ZZ".

Example: **ZZ 1ID DMAIN G3 OPS ZZ 4 ZZ**

(2) Channel 4 is used the same as the MCS LAN only now the MCS LAN is extended throughout the MSE communications system.

(3) You can also use the List 1 - 4 function on the Destination Terminal Page to send a message to multiple addressees at the same time. (NOTE: This is an enhanced feature that did not work on the circuit switch network.)

e. SEND MESSAGES. You are now ready to send messages over the MSE Packet Network (MPN).

(1) All messages are prepared and transmitted the same way as with the standard MCS LAN configuration. The one exception is the file transfer. All file transfers must be done from IBP when on the Packet Network. Do not use the MCS Format Directory for file transfers.

(2) All messages except file transfers can only be sent to those destinations contained in the Destination Terminal Page.

NOTE: File transfers can be sent to any terminal on the Packet Network and will be explained below.

f. IBP FILE TRANSFERS.

(1) Sending IBP file transfers:

(1) The called party answers the phone.

(2) A busy tone is heard.

(3) A computer voice tells you that "the number you are calling is not assigned or out of service".

9. SUBSCRIBER FEATURES. Several calling features, described below, are available in MSE. Due to system limitations, however, these features are often restricted to high priority users. Authorization for each calling feature is determined by your "subscriber profile" set by the corps G6 or division signal office. See your Signal Officer to find out your profile features. The operator can generally provide you one-time access to a calling feature, if required.

a. PRECEDENCE.

Using precedence allows you to preempt calls of a lower precedence when you have mission critical traffic. The precedences available in MSE are:

Highest	: Flashoverride	- "FO" Button on the phone
	: Flash	- "F" Button on the phone
	: Immediate	- "I" Button on the phone
	: Priority	- "P" Button on the phone
Lowest	: Routine	- All normal calls are routine by default.

Use precedence only when the message warrants its use and use the lowest possible level required to get the message through. The system will not allow you to dial a number at a higher precedence than your user profile allows. If you attempt to do so, you will receive a recorded message telling you the precedence of your call is being downgraded to the appropriate level allowed. To use precedence with a phone call dial:

[P] [AAA]-ZZZ-XXXX

where P is the Precedence key.

b. CONFERENCE CALLS.

(1) PROGRESSIVE CONFERENCES. This feature allows you to speak to more than one party simultaneously. It is similar to commercial conference calling. Only those subscribers whose user profile authorizes conferencing will be able to direct dial a conference call. Your operator can set up a conference call on a

NOTE: MSE operators will not process unofficial calls. The caller must provide NAME, RANK, and UNIT and the post/commercial/DSN number desired.

(2) COMMERCIAL OR DSN TO MSE. To place a call from a post, commercial, or DSN phone to a MSE phone dial one of the local telephone numbers listed in the chart at the back cover of the directory and give the operator the MSE phone number of the party you want to call.

IMPORTANT: You must know the MSE telephone number you want to call. MSE operators do not have the capability to look up phone numbers.

10. ECHELONS ABOVE CORPS (EAC) INTERFACE. To call into the TRITAC network dial the EAC area code and the telephone number of the party you wish to call. For example, dial: (AAA)-ZZZ-XXXX where:

- AAA is the area code

- ZZZ-XXXX is the telephone number of the EAC subscriber you want.

11. PROFILES. "User profiles" are used in the MSE system to group subscribers who are part of the same organization and to define which system features a subscriber is authorized to use.

a. PROFILE MATRIX DEFINITIONS. Use the following to read the matrix in subparagraph b.

PR = PROFILE = The number of the profile being defined.

TT = TERMINAL TYPE = Defines the type of instrument. (13 = DNVT, 3 = DSVT)

NRI = NET RADIO INTERFACE = A yes entry indicates this terminal can be configured as a net radio interface terminal.

SEC = SECURITY = Determines whether the supported instrument is protected by physical security (P) or end to end encryption (E).

MOD = MODE = Determines whether the terminal is used for voice only (V), data only (D), or both (M).

MSG = MESSAGE SWITCH COMPATIBLE = Identifies whether the terminal is required to interface with an automatic message switch.

CML = COMMERCIAL ACCESS = Identifies subscribers authorized to initiate post/commercial/DSN calls.

g. POWER-UP PROCEDURES.

(1) Make sure Power Conversion Unit (PCU) ground connection is tight.

(2) Turn OFF PCU master power switch, PCU AC output circuit breaker and all other unit power switches.

(3) Connect PCU to power source. Power input light should come on.

(4) Turn ON PCU master power switch. Green MASTER POWER indicator lights up. Yellow UPS ON indicator lights up.

(5) When green AC output indicator light comes on, and fan starts, turn ON PCU AC output circuit breaker. Caution: DO NOT turn on AC output circuit breaker before light comes on. This may damage CPU.

(6) Check UPS ON indicator light. If lit, STOP. Unit is operating on backup power. Troubleshoot.

(7) Has system software been loaded? If NO, STOP. Get assistance in tape loading procedure. If YES, continue.

(8) Turn ON the power switch on the PCIU. Observe that the POWER light comes on. (TCPs ONLY)

(9) If disk/tape unit was not turned on in step g, turn the switches ON now. ON LINE indicator lights up.

(10) Turn ON line switch on flexible disk drive (on Display Unit). Observe activity indicator light flashing.

(11) Turn ON monitor power switch on Display Unit.

(12) Turn ON power switch on rear of printer. Observe that POWER indicator light comes on.

(13) Turn ON power switch on CPU. Observe that POWER indicator light comes on.

RESULT: System boots MCS program and begins loading from hard disks.

(14) System asks "Is the address <<____>> correct (Y or N, default: Y)." If your nodal address is correct, enter Y; if not, enter N and then correct address. You can find the correct

nodal address either under the "User Name" column in the telephone number listing of this directory or on one of the MCS Architecture charts in the record traffic section of the directory.

(15) System asks "Is the date _____ correct? (Y or N, default: Y)." If date is correct, enter Y; if not, enter N and then new date/time.

h. VERIFY MCS INITIALIZATION DATA.

(1) After initializing the MCS device, select the PRINT ALL Variable Function Key (VFK) to print a copy of the initialization data. This data should include the following pages:

(a) System Initialization

(b) Destination Terminal Identification

(c) Telephone Directory

(d) Communications Channel Code Definition

(e) Channel Status

(f) Database Initialization

(2) Compare the printouts with the Destination Terminal Page given for that device, the MSE telephone directory and the Database Initialization pages given for that device.

(3) Each MCS operator will maintain a current copy of their System and Database initialization pages. They will also save them on floppy disk.

i. VERIFY MCS/MSE COMMUNICATIONS.

(1) After you have completed system and database initialization, construct a free-text message with "COMMO CHECK" in the subject field. Address this message to each device, one at a time, listed in the Destination Terminal Identification page.

(2) If a message aborts over channel 1 or channel 2 (DSVT dial-up channels), perform Tactical Communications Troubleshooting Procedures in the MCS Quick Reference Guide.

- 2C tells the switch to forward your phone calls

- [AAA] ZZZ-XXXX is the phone number to which you want your calls forwarded.

You will still be able to make outgoing calls from your phone, but all incoming calls will be routed to the other phone. To cancel call forwarding, dial "2C" and YOUR directory number. This must be done from the original phone.

d. POST PHONE SYSTEM/DSN ACCESS. In some cases MSE will be tied in with the local Post Dial Central Office (DCO) telephone service.

(1) MSE TO POST PHONE SYSTEM, COMMERCIAL OR DSN.

(a) To access this service dial "5C". If you are authorized DCO access and you are connected to a SEN or LEN terminating post phone lines, you will get a commercial dial tone. (To determine your profile, check the exercise directory. Then match the profile with the matrix in paragraph 13 of this pam) You may then dial the number you wish to call. For example: To reach a Fort Hood number dial: "5C" (dial tone) 287-XXXX or 288-XXXX where:

- 5C tells MSE you want to place a call to a commercial phone.

- (dial tone) - indicates you must wait for a commercial dial tone

- 287-XXXX (288-XXXX) is the Ft. Hood telephone number you wish to dial.

(b) To reach a local off-post, dial: "5C" (dial tone) 9 + local number.

(c) To access DSN, dial: "5C" (dial tone) 88 + DSN number.

(d) If you are not connected to a SEN or LEN terminating post phone lines or are not authorized commercial access, the operator will intercept your call and place the post, commercial or DSN call for you if the lines are available. You can also dial one of the SENS that is terminating post phone lines and ask the operator to place the call for you. See the chart inside the back cover of the exercise phone directory for a list of SENs with post phone lines.

b. PROFILE MATRIX

PR	IT	NRI	SEC	MOD	MSG	CML	CON	FWD	EUB	KEY	TLC	PRE	CD	ZN	DAS	
01	3	N	P	V	N	Y	Y	Y	Y	03	1	FO	1	0	N	COMMON
02	3	N	P	V	N	Y	Y	Y	Y	03	1	F	1	0	N	MSRT-DSVT
03	3	N	P	V	N	Y	Y	Y	Y	04	1	I	1	1	N	CD 1
04	3	N	P	V	N	Y	Y	Y	Y	05	1	P	1	2	N	
05	3	N	P	V	N	Y	Y	Y	Y	06	2	R	1	4	N	
06	3	N	P	V	N	N	Y	Y	N	07	5	R	1	5	N	
07	3	N	P	V	N	Y	Y	Y	Y	08	1	F	2	0	N	COMMON
08	3	N	P	V	N	Y	Y	Y	Y	09	1	I	2	1	N	MSRT-DSVT
09	3	N	P	V	N	Y	Y	Y	Y	10	1	P	2	2	N	CD 2
10	3	N	P	V	N	Y	Y	Y	Y	11	2	R	2	4	N	
11	3	N	P	V	N	N	Y	Y	N	12	5	R	2	5	N	
12	3	N	P	V	N	Y	Y	Y	Y	13	1	I	1	1	N	2D AD
13	3	N	P	V	N	Y	Y	Y	Y	13	1	P	1	2	N	GROUP 1
14	3	N	P	V	N	N	Y	Y	N	13	5	R	1	5	N	
15	3	N	P	V	N	Y	Y	Y	Y	14	1	I	1	1	N	2D AD
16	3	N	P	V	N	Y	Y	Y	Y	14	1	P	1	2	N	GROUP 2
17	3	N	P	V	N	N	Y	Y	N	14	5	R	1	5	N	
18	3	N	P	V	N	Y	Y	Y	Y	15	1	I	1	1	N	4TH ID
19	3	N	P	V	N	Y	Y	Y	Y	15	1	P	1	2	N	GROUP 3
20	3	N	P	V	N	N	Y	Y	N	15	5	R	1	5	N	
21	3	N	P	V	N	Y	Y	Y	Y	16	1	I	1	1	N	50TH AD
22	3	N	P	V	N	Y	Y	Y	Y	16	1	P	1	2	N	GROUP 4
23	3	N	P	V	N	N	Y	Y	N	16	5	R	1	5	N	
24	3	N	P	V	N	Y	Y	Y	Y	17	1	I	1	1	N	49TH AD
25	3	N	P	V	N	Y	Y	Y	Y	17	1	P	1	2	N	GROUP 5
26	3	N	P	V	N	N	Y	Y	N	17	5	R	1	5	N	
27	3	N	P	V	N	Y	Y	Y	Y	18	1	I	1	1	N	MSRT
28	3	N	P	V	N	Y	Y	Y	Y	18	1	P	1	2	N	GROUP 6
29	3	N	P	V	N	N	Y	Y	N	18	5	R	1	5	N	
30	3	N	P	V	N	Y	Y	Y	Y	19	1	I	1	1	N	1ST ID
31	3	N	P	V	N	Y	Y	Y	Y	19	1	P	1	2	N	GROUP 7
32	3	N	P	V	N	N	Y	Y	N	19	5	R	1	5	N	
33	3	N	P	M	Y	N	N	N	Y	20	2	F	0	6	N	MSRT/DSVT
34	3	N	P	M	Y	N	N	N	Y	21	2	I	O	6	N	DATA
35	3	N	P	M	Y	N	N	N	Y	22	3	P	0	6	N	
36	3	N	P	M	Y	N	N	N	N	23	3	R	0	6	N	
37	3	N	P	V	N	N	N	N	Y	24	1	I	0	0	Y	DSVT DAS
38	3	Y	P	V	N	N	N	N	Y	25	1	I	0	0	N	NRI
39	3	N	E	M	Y	N	N	N	N	26	1	I	1	0	N	TS/SCI
40	3	N	E	M	Y	N	N	N	N	27	1	I	1	0	N	USERS

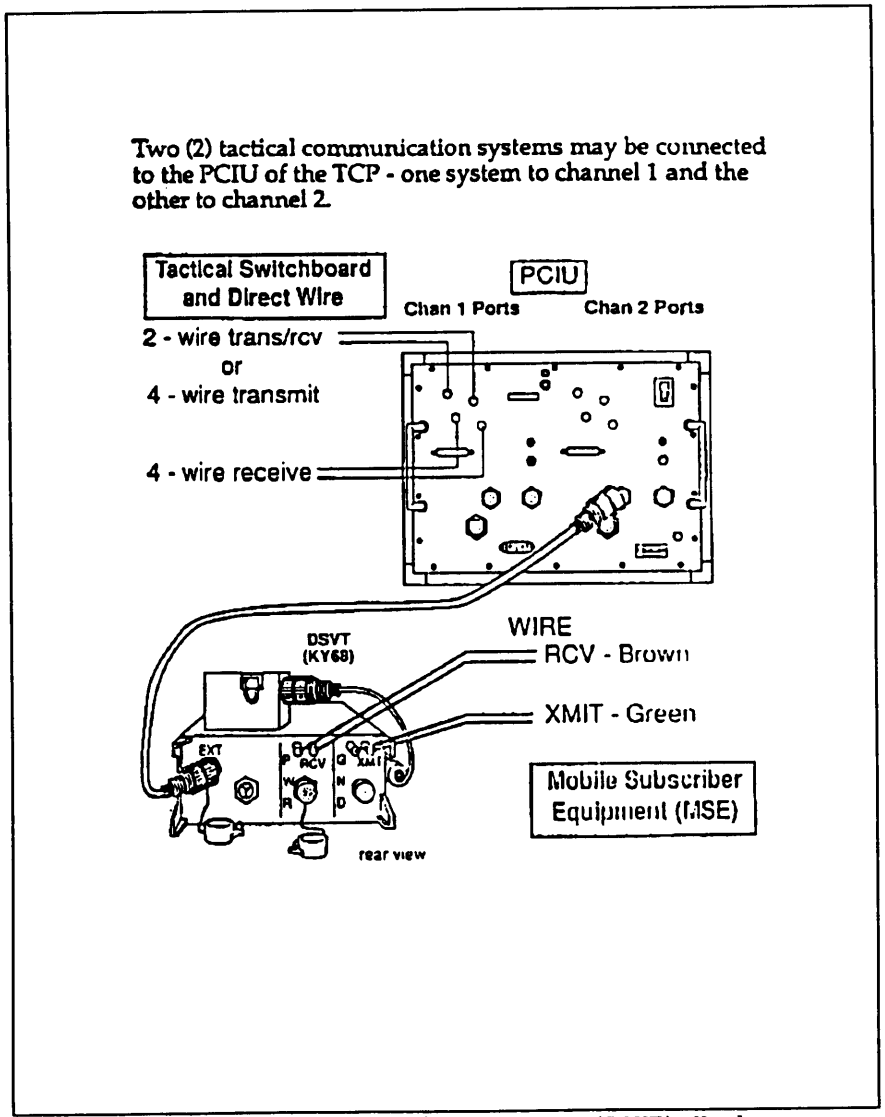


Figure 14 - MCS to MSE Wireline - KY-68 (DSVT) Hookup

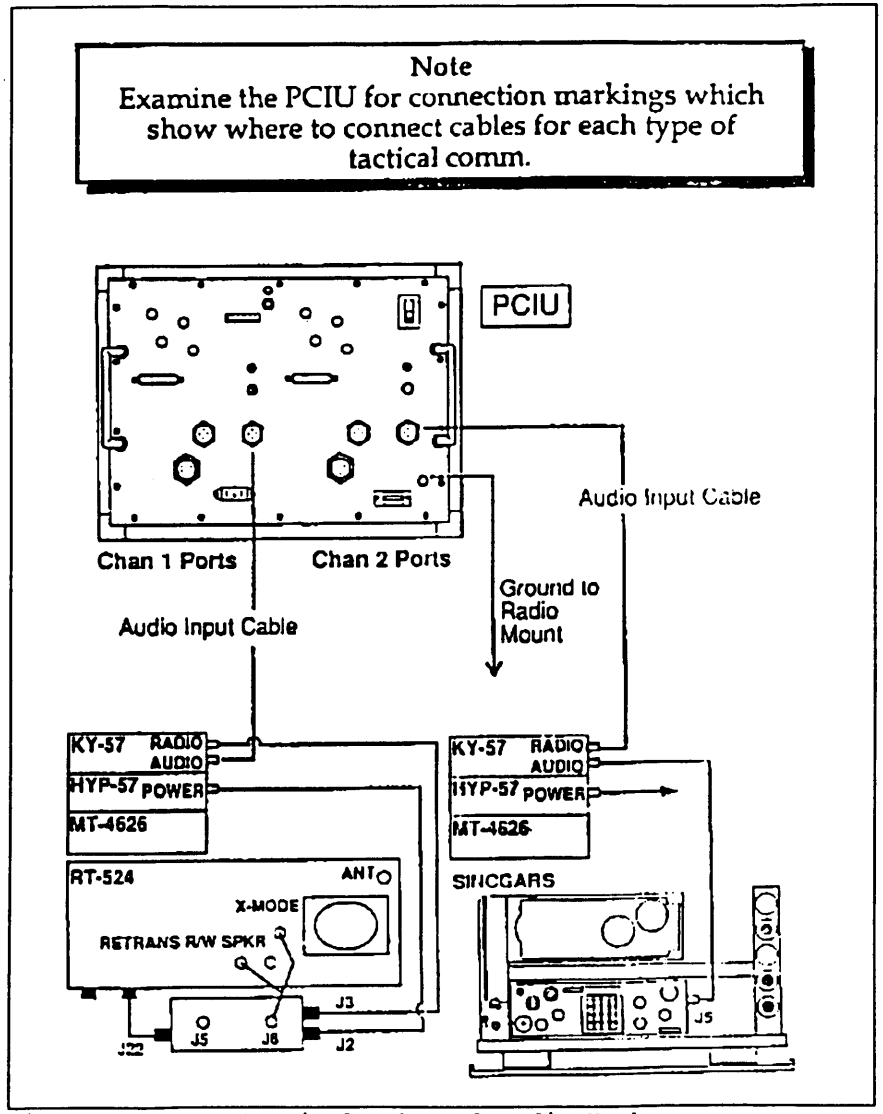


Figure 15 - MCS to Single Channel Radio Hookup

FWD = CALL FORWARDING = A YES indicates the subscriber may use the call forwarding feature.

EUB = ESSENTIAL USER BYPASS = Identifies subscribers who are added to the essential user bypass list.

UKEY = U KEY = Identifies the DSVT unique encryption key for the subscriber.

TLC = TRAFFIC LOAD CONTROL = Indicates what level of use the subscriber has when traffic load control is implemented.

PREC = PRECEDENCE LEVEL = Identifies the maximum authorized precedence level for the subscriber. R = Routine; P = Priority; I = Immediate; F = Flash; FO = Flash Override.

CD = COMPRESSED DIAL LIST = Identifies the compressed dial list the subscriber is authorized to use.

ZON = ZONE RESTRICTION LIST = Indicates which zone restriction list the subscriber is assigned to. (0 = No Zone Restriction)

DAS = DIRECT ACCESS = a YES indicates these telephones will automatically ring another designated instrument when the receiver is lifted.

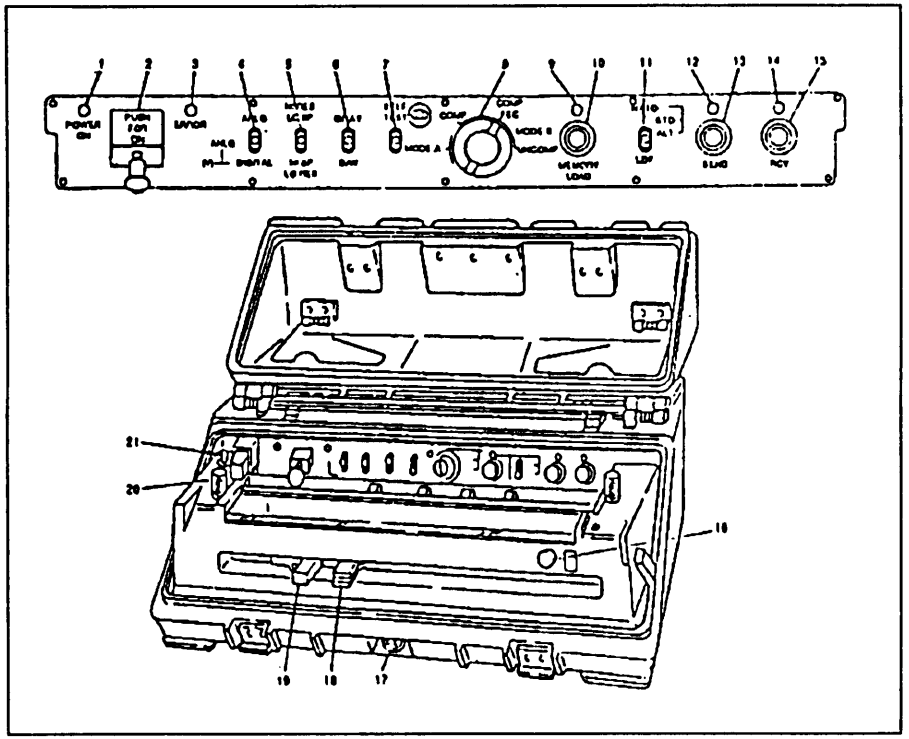


Figure 7 - UXC-7 Fax Controls

c. CONFIGURE THE FAX (Figure 7):

(1) Unlock carriage handle.

(2) Turn the Mode switch to any B position.

(3) Turn the Analog/digital switch to digital.

(4) Select HI RES-LO SP/HI SP-LO RES as needed by document.

(5) Select GRAY-B/W as needed (The normal setting is B/W).

d. LOCAL AREA NETWORK (LAN) SETUP.

(1) Safety. Because of the existence of electrical hazards associated with LAN cabling, adhere to the following steps for the safety of personnel when working with the LAN.

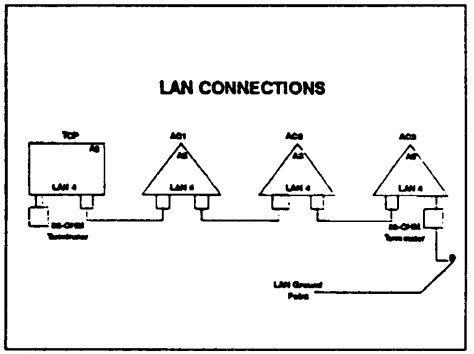


Figure 13 - MCS LAN Connections

(a) Ensure the LAN is grounded at one point in the system by a LAN terminator plug to a ground point.

(b) Ensure that equipment is properly grounded.

(c) Ensure that the vehicle is properly grounded.

(d) Do not use cabling with exposed or broken wiring.

(2) Precautions. Most MCS LAN problems can be prevented by following these simple steps.

(a) When initially powering up the MCS system, ensure that both LAN terminator plugs (50 ohm resistor plugs which reflect the signal flow) are installed. The terminator plugs are supplied with the unit and should hang off small chains on the left side of the central processing unit.

(b) Ensure that LAN cables are placed out of the way of foot and vehicular traffic. Because of the brittle nature of the LAN cable, the preferred method of removing the cable from the threat of vehicular traffic is overheading.

(c) Do not run LAN cables through doorways, since closing the doors may short or cut the cable.

(d) Do not place LAN cables near power cables.

(3) LAN Setup (Figure 13, LAN Connections)

(a) Remove one terminator plug from a LAN 4 connector on one of the MCS devices. Take one end of the coaxial LAN cable that comes with each Analyst Console, and connect it to the LAN 4 connector.

(b) Attach the other end of the LAN cable to a LAN 4 connector of a TCP or AC in the LAN.

(c) Repeat steps 1 and 2 until all devices in the LAN are connected as shown in Figure 13.

(d) Ensure the MCS LAN is grounded at only one point in the LAN configuration. Do this by using a LAN ground terminal point on only one unit.

(e) Ensure terminator plugs are installed on the two LAN connections that are not hooked up.

e. TACTICAL COMMUNICATIONS HOOKUPS.

(1) Examine the Programmable Communications Interface Unit (PCIU) (A6 or lower right box of TCP) for connection markings that show where to connect cables for each type of tactical communications device.

(2) Two (2) tactical communications systems may be connected to the PCIU of the TCP - one system to channel 1 and the other to channel 2. See Figures 14 and 15.

f. CONNECTION TO MSE.

(1) A common hookup in the field is the KY-68 DSVT to MCS. The port on the PCIU for connecting the cable from the DSVT is clearly marked (Figure 14). Be sure not to use the one for the KY-57. This is for a tactical radio hookup (Figure 15).

(2) See the general MSE instructions for hooking up, loading COMSEC, and affiliating a KY-68 DSVT.

(3) Attach the "DSVT" (JA) end (female connector) of a TCIU(PCIU)/DSVT modem cable to the external data connector (marked "EXT") of the KY-68. Attach the other end (marked "TCT/PCIU" - male connector) to the PCIU port marked "KY-68". See Figure 14.

PR	IT	NRI	SEC	MOD	MSG	CML	CON	FWD	EUB	KEY	TLC	PRE CD		ZN	DAS	
41	13	N	P	V	N	Y	Y	Y	Y	0	1	F0	1	0	N	DNVT 1
42	13	N	P	V	N	Y	Y	Y	Y	0	1	F	1	0	N	
43	13	N	P	V	N	Y	Y	Y	Y	0	1	I	1	1	N	
44	13	N	P	V	N	Y	Y	Y	Y	0	1	P	1	2	N	
45	13	N	P	V	N	N	Y	Y	Y	0	1	P	1	3	N	
46	13	N	P	V	N	Y	Y	Y	Y	0	2	R	1	4	N	
47	13	N	P	V	N	N	Y	Y	N	0	5	R	1	5	N	
48	13	N	P	V	N	Y	Y	Y	Y	0	1	F	2	0	N	DNVT CD 2
49	13	N	P	V	N	Y	Y	Y	Y	0	1	I	2	1	N	
50	13	N	P	V	N	Y	Y	Y	Y	0	1	P	2	2	N	
51	13	N	P	V	N	N	Y	Y	Y	0	1	P	2	3	N	
52	13	N	P	V	N	Y	Y	N	Y	0	2	R	2	4	N	
53	13	N	P	V	N	N	Y	N	N	0	5	R	2	5	N	
54	13	N	P	M	N	N	N	N	Y	0	2	F	0	6	N	DNVT DATA
55	13	N	P	M	N	N	N	N	Y	0	2	I	0	6	N	
56	13	N	P	M	N	N	N	N	Y	0	3	P	0	6	N	
57	13	N	P	M	N	N	N	N	N	0	3	R	0	6	N	
58	13	N	P	V	N	N	N	N	Y	0	1	I	0	0	Y	DNVT DAS
59	248	N	N	V	N	N	N	N	N	0	1	I	2	1	N	ANALOG
60	248	N	N	V	N	N	N	N	N	0	1	P	2	3	N	
61	248	N	N	V	N	N	N	N	N	0	5	R	2	5	N	
62	16	N	P	M	N	N	N	N	Y	0	1	FO	0	0	N	LG-1 DTA
63	15	N	P	D	N	N	N	N	Y	0	1	FO	0	0	N	

12. FAX SETUP AND OPERATION. The UXC-7 Facsimile machine can be used over the MSE network by following the steps below. You will need a special fax modem cable (provided with the UXC-7) to hook the fax machine to an MSE telephone (either a DNVT or DSVT).

a. AFFILIATE THE TELEPHONE. Ensure that your telephone is affiliated.

b. PROPER CONNECTIONS. Ensure that the FAX is properly connected to your telephone. Attach the FAX/DNVT(DSVT) modem cable (09-2735236) to the external data connector (marked "DATA") on the telephone. Attach the other end to the data port on the right rear of the fax.

(5) Press the REC button to print out the message.

(6) When the received message spools off the drum, press the paper release button to remove the message and carbon.

g. TO MAKE A COPY.

(1) Load the original into memory as if you were going to send a Fax.

(2) Insert copy paper into the FAX (if using carbon, place it on top of your blank, carbon side facing the paper, and insert both).

(3) Press SELF TEST switch.

13. AN/UGC-144 COMMUNICATIONS TERMINAL (CT) SETUP PROCEDURES

a. REFERENCE. Detailed information on CT setup and operation can be found in TM 11-7025-267-12, OPERATOR'S AND UNIT MAINTENANCE MANUAL. Additional information can also be found in the "CT Cookbook" which is produced and distributed by the Automation Division, III Corps G6. The "CT Cookbook" contains information condensed from the TM as well as trouble-shooting information gleaned from past field exercises. This document is also very important as it contains the III Corps standard setup for the SYSTEM and Single Subscriber Interface (SSI) Setup Tables.

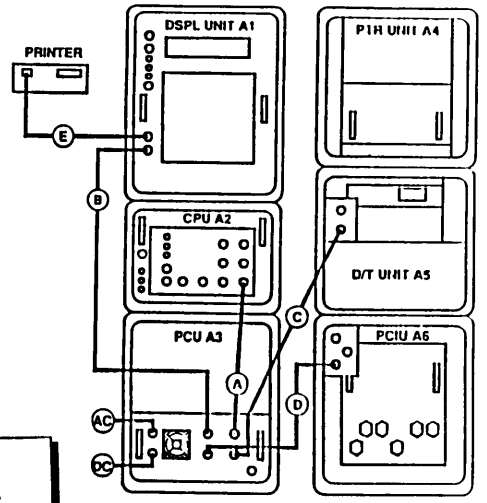
b. CONNECTION TO MSE. All III Corps record traffic is transmitted over the MSE network via the DSVT (KY-68). Use the CT DSVT/DNVT (A3096907) interface cable. Ensure the DSVT has the proper COMSEC keys loaded and is affiliated. Instructions for installing a DSVT can be found in Section 5.

c. CABLING INSTRUCTIONS. All connections are made on the rear of the CT and Printer. See Figure 8.

(1) Install 115 VAC CT power cable (A3096904) to the connector marked J4-PWR.

(2) Install 115 VAC Printer power cable (A3096912) to connector on rear of printer marked POWER.

(3) Install a DSVT/DNVT cable (A3096907) to the connector marked SSI J1 and the other end to DSVT.



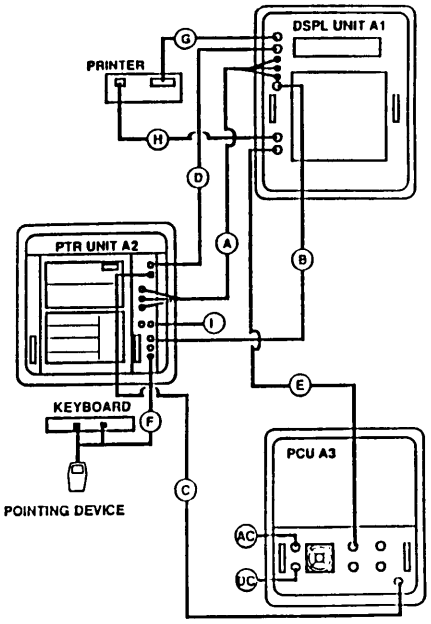
Note
Cables are number coded to match the box to which they are connecting. Example: A3-3 connects to A1-1.

Diagram Code	Part Number	From Unit	From Connector	To Unit	To Connector
A	A3057746-1	A2	7	A3	4
B	A3057746-4	A3	3	A1	4
C	A3057746-2	A3	6	A5	2
D	A3057746-1	A3	5	A6	2
E	A3057741	A1	5	Printer	

WARNING
DO NOT connect the main power cable until all other cables are connected and the system is propery grounded.

AC	A3057419	A3	AC Pwr Outlet	AC Power
DC	A3057418	A3	DC Pwr Outlet	DC Power

Figure 11 - MCS TCP Power Wiring



Note
Cables are color and number coded to match the box to which they are connecting. Example: Brown A2-9 from the Central Processing Unit connects to Yellow A1-7 on the Display Uniy.

Diagram Code	Part Number	From		To	
		Unit	Connector	Unit	Connector
A	A3057738	A2	RGB	A1	RGB
B	A3057717	A2	7	A1	6
C	A3057446	A2	8	A3	9
D	A3057745-3	A2	9	A1	7
E	A3057746-5	A1	4	A3	3
F	A3057728	A2	5	Keyboard	
G	A3057742	A1	8	Printer	
H	A3057741	A1	5	Printer	
I	MS-2581-R3	A2	LAN1	LAN	

WARNING
DO NOT connect the main power cable until all other cables are connected and the system is propery grounded.

AC	A3057449	A3	AC Pwr Outlet	AC Power Source
DC	A3057448	A3	DC Pwr Outlet	DC Power Source

Figure 12 - MCS AC Signal and Power Wiring

(6) Set the NATO switch to the LDF position.

d. TURN THE POWER ON (push in the power switch).

e. SENDING A FAX.

(1) Press the paper release lever and insert paper to transmit slot. Place paper text side up length wise into the FAX.

(2) Set margins by sliding the margin tabs to both edges of the document.

(3) Press memory load button.

(4) When the scan is finished, remove the paper, verify that the memory load indicator is lit.

(5) Call the telephone number of the receiving fax machine.

(6) Ensure that the distant station has all FAX switches set in the same position as the sending machine.

(7) Instruct the distant station to press the REC button. At this time, press the SEND button.

f. RECEIVING A FAX.

(1) Ensure that the switches on your facsimile machine are set the same as those on the transmitting station's machine.

(2) Upon direction of the transmitting station, press the REC button on your facsimile machine.

(3) When transmission is completed and the message is received in the memory of your facsimile machine, you are ready to print the document.

(4) Use a piece of facsimile paper, or place a piece of carbon paper on top of a piece of plain white paper (carbon side facing the white paper).

(5) Press the paper release button and insert carbon and paper into the machine.

(6) Press the paper load button to load the paper onto the drum of the facsimile machine.

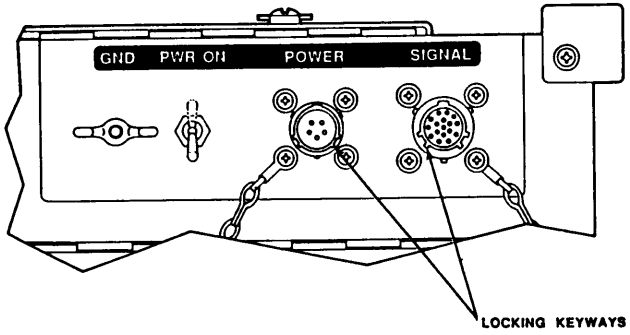
Printer Rear Connector Panel.

GND -- Terminal for ground wire.

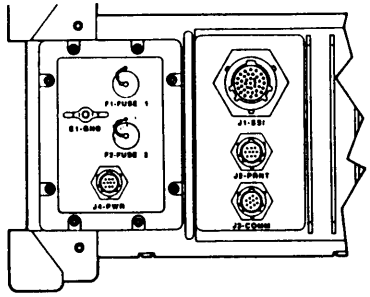
PWR ON -- ON/OFF power switch.

POWER -- Connector for 1W3 power cable.

SIGNAL -- Connector for 1W4 printer signal cable to terminal.



Terminal Rear Connector Panel.



J4-PWR -- Connector for 1W1 power cable

E1-GND -- Grounding stud for attachment of ground wire

F1-FUSE 1/F2-FUSE 2 -- Protective power fuses for the Terminal Assembly.

J1-SSI -- Connector for I/O device.

J2-PRNT -- Connector for printer signal cable 1W4.

J3-COMM --Auxiliary communications port -- used during loopback test.

Figure 8 - UGC-144 Connections

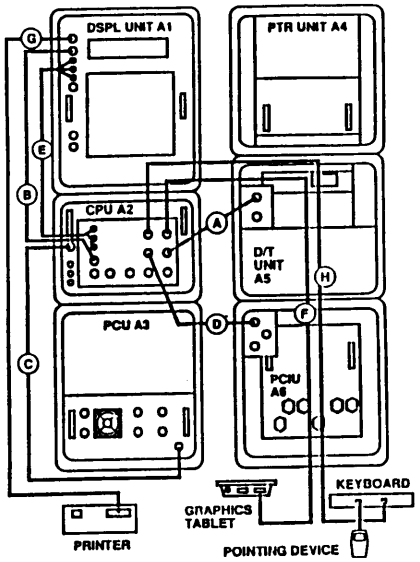
can usually be obtained from your Signal Officer or your supporting SENS team chief.

14. MANEUVER CONTROL SYSTEM (MCS) SETUP PROCEDURES.

a. REFERENCE. Detailed information for setup and operation can be found in TM 11-5895-1348-12-1 for the Tactical Computer Processor (TCP - AN/UYQ-43(V)1) and TM 11-5895-1371-12-1 for the Analyst Console (AC - AN/UYQ-43(V)2). The Maneuver Control System Quick Reference Guide also provides easy-to-follow procedures on the proper setup of the TCP and AC.

b. GROUNDING. Ensure system is properly grounded prior to power-up. Failure to do so may result in personal injury and/or damage to the equipment.

c. CABLING. Cables are coded by color and number to match the box to which they are connected. Do not connect the main power cable until all other cables are connected and the system is properly grounded. See Figures 10, 11, and 12 for proper cabling of the Tactical Computer Processor (TCP) and Analyst Console (AC).



Note
Cables are color and number coded to match the box to which they are connecting. Example: A2-9 connects to A1-7.

Note
Connect the printer, graphics tablet and keyboard after workshelves are installed.

Diagram Code	Part Number	From		To	
		Unit	Connector	Unit	Connector
A	A3057745-1	A2	8	A5	1
B	A3057745-2	A2	9	A1	7
C	A3057743	A2	10	A3	9
D	A3057744	A2	13	A6	1
E	A3057738	A2	RGB	A1	RGB
F	A3057549	A2	6	Graphics Tablet	
G	A3057742	A1	8	Printer	
H	A3057720	A2	5	Keyboard	
I	MH2528Lxx	A2	LAN	LAN	

Figure 10 - MCS TCP Signal Wiring

(4) Install the Printer interface cable (A3096911) to the connector marked PRNT J and the other end to the connector on rear of printer marked SIGNAL.

(5) The connector marked COMM J3 on the rear of the CT is used for loopback testing only.

d. SELF TEST. Prior to bringing the CT on-line, conduct the self-test to insure the CT is operating properly.

(1) Install the three loopback plugs to the SSI J1, PRNT J, and COMM J3 connectors located at the rear of the CT. See Figure 8.

(2) Turn the system on. When the message comes on the screen asking if you want to conduct the self-test, reply "Y" for yes.

(3) Follow instructions on the screen as they occur.

e. THE PRINTER SELF-TEST. The printer self-test is performed by holding down the FORM FEED button while turning on power at the same time. Release the button and one page of test patterns is printed.

f. PREPARING THE CT FOR OPERATION. Refer to Figure 9 for Menus/Commands Flowchart.

(1) Turn on the power switch and reply "N" to self-test message. This will bring up the MAIN Menu screen. From the MAIN Menu select the SETUP Menu (F1).

(2) Select DTU (F1) from the SETUP Menu. Set the date and time. Unless directed otherwise (usually for exercise play), use local time for ZULU time. Messages listed in the directories are listed by date and ZULU time, it is easier to identify messages if using local time. Note, the date/time must be set each time the CT is powered on. Return to the SETUP Menu by pressing the MENU key in the lower right-hand corner of the keyboard.

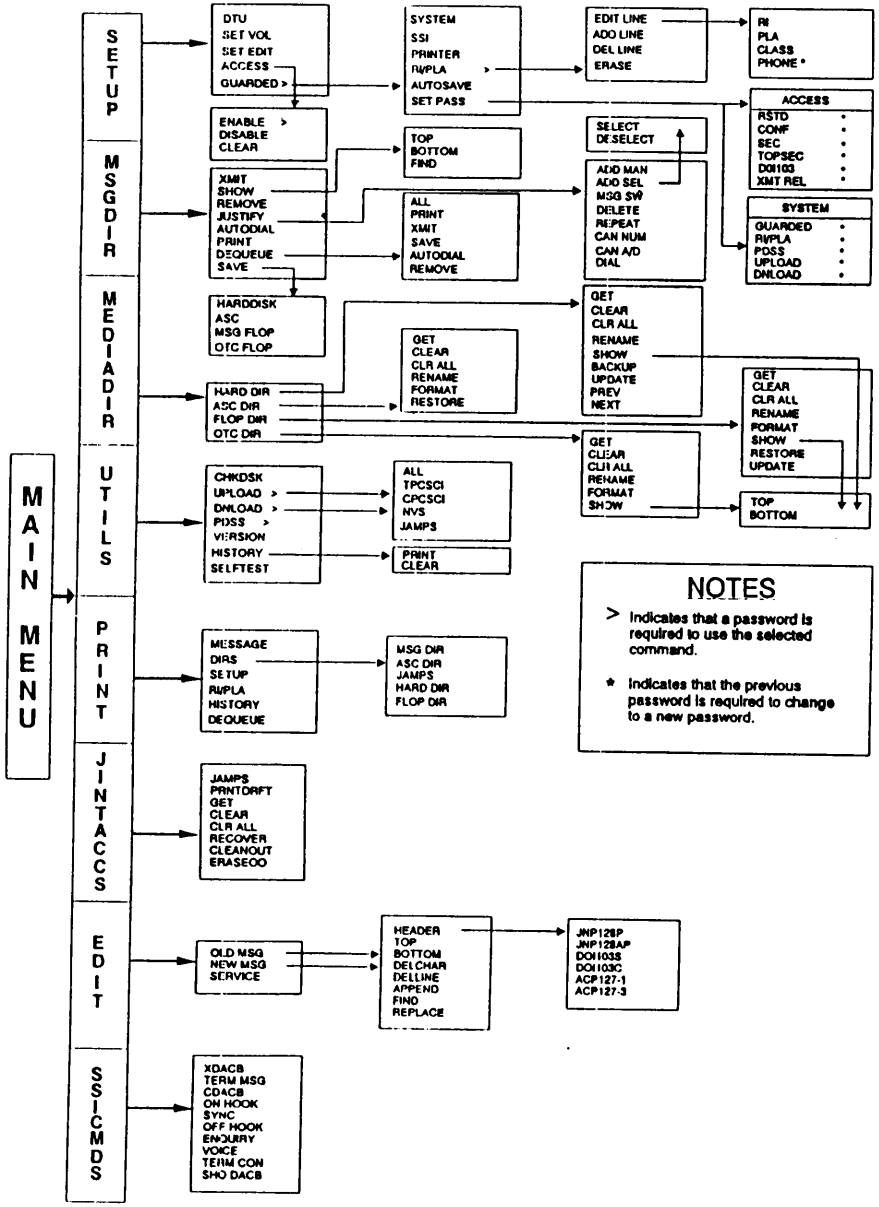


Figure 9 - UGC-144 (CT) Main Menu

(5) Select SSI (F2) from the GUARDED Menu. The SSI SETUP Menu should be set to the entries as shown below (next page). When completed, hit MENU key to return to the GUARDED Menu.

SSI SETUP TABLE

Master/Slave	SLAVE
DACB Protocol	ON
Channel Control	MODE I CONTINUOUS
Message Code/Parity	ASCII ODD PARITY
Loop Rate	16000
Data Rate	2400
Error Control	MULTI-SAMPLING
SSI Interface	DSVT (if that's what you're using)
Auto Resync	OFF
Clock Source	INTERNAL
EXT Clock Polarity	POSITIVE
Transmit Signal Sense	MARK POSITIVE
Receive Signal Sense	MARK POSITIVE
Serial Data Code	NRZ
Number Of Stop Bits	1
Data Mode Control	ON
Mode VI Storage Blocks	NONE
Mode I Answer Timer	DEFAULT

(6) Select RI/PLA (F4) from the GUARDED Menu. This is where the Routing Indicator (RI), Plain Language Address (PLA), and phone numbers are set for the other CT's you will send traffic to during the exercise. This information can be found in the Communications Terminals section of this telephone book. When entering telephone numbers, it is a good habit to include the MSE area code. This is not necessary for users within the same area code but is a good habit since some users may be in another area code. When completed, hit MENU key to return to the GUARDED Menu.

(7) Under the GUARDED Menu there are selections marked PRINTER, AUTOSAVE and SET PASS. It is not recommended that passwords be changed, but if it's necessary to do so, the SET PASS Menu is where that is done. LEAVE PASSWORDS AT THE DEFAULT SETTINGS. The AUTOSAVE Menu is self-explanatory and may be set to personal preference. The PRINTER SETUP Menu should be set as shown below.

PRINTER SETUP TABLE

Baud Rate	9600
Data Bits	7
Stop Bits	1
Parity	ODD
Auto-Opt	Move left-right arrow to choose one of four option; select whether you want the printer to print all messages received, transmitted, or received and transmitted. Select "Off" to leave the automatic print option off.

(8) When completed, hit MENU key to return to the GUARDED Menu, hit MENU key again to go back to the SETUP Menu. When you hit the MENU key again to return to the MAIN Menu a message will appear at the bottom of the screen asking if you want to save your settings. It is a good habit to always reply with a "Y" for yes. When back to the MAIN Menu the CT is now ready for operations.

f. IMPORTANT NOTES to remember:

(1) In order to receive messages there must be a formatted 3-1/2" diskette in the Auxiliary Storage Cassette (ASC) drive. This is the floppy disk drive on the left hand side of the drive bay. If your CT does not have an ASC drive, but has the old data cartridge, it is obsolete and must be modified. Call G6 for further information.

(2) Always insure the KY-68 has the correct COMSEC fill and is affiliated.

(3) When sending a message to multiple addressees, send it to the TYC-39 which in turn will forward the message to all message addressees. This will mean the message is transmitted only once instead of being sent individually to each addressee. In addition, if an addressee is off-line the TYC-39 will save the message and transmit it when the distant end is up.

(4) Diskettes used by the CT *must* be formatted by the CT, diskettes formatted on a PC will not work. The diskette in the ASC drive must be formatted as an ASC diskette.

(5) As mentioned above, it is a good habit to always include the area code when updating the RI/PLA Table, do not assume that everyone is in the same area code. This information

(3) Select ACCESS (F4) from the SETUP Menu. This is where the security classification for the CT is set. Note that Unclassified is enabled and all the rest are disabled. Enable the highest classification authorized for your CT, usually Secret. This should also match the security classification set in the SYSTEM table discussed in the next paragraph. There is one other setting that must be made in this menu, the Enable Transmit. The CT will not transmit messages unless the transmit switch is enabled. When through with this menu, hit the MENU key and return to the SETUP Menu. Note, as with the date/time in the DTU Menu, the ACCESS settings must be reset every time the CT is powered up.

(4) Select GUARDED (F5) from the SETUP Menu. Unlike the DTU and ACCESS Menus, all tables set in the GUARDED Menu will stay in effect until changed by the operator even if the unit is powered down. Select SYSTEM (F1) to update the System Table. The entries for this table are shown in the SYSTEM SETUP Table below.

SYSTEM SETUP TABLE

Terminal Community	R
Content/Comm Indicator	ZYUW
Originator/Destination	LMFAA
Terminal Routing Indicator	This is the specific routing indicator for your terminal. See the CT Section of the phone directory for this information.
Terminal Plain Lang. Addr.	This is the specific plain language address for your terminal. See the CT Section of the phone directory for this information.
Terminal Classification	S-SECRET or U-UNCLASSIFIED
Terminal Phone Number	This is the specific telephone number for your terminal. See the CT Section of the phone directory for this information.
Channel ID	CSA (Cannot change)
EOL Sequence	<CR><CR><LF>
Xmit Start Envelope	
Xmit Stop Envelope	<LF><LF><LF><LF><LF><LF><LF>NNNN
Rcv Start Envelope	
Rcv Stop Envelope	<LF><LF><LF><LF><LF><LF><LF>NNNN

Note: <CR> - Carriage Return key
<LF> - Line Feed key