UNITED STATES MARINE CORPS
FIELD MEDICAL TRAINING BATTALION
Camp Lejeune, NC 28542-0042

FMST 306

Field Communications

TERMINAL LEARNING OBJECTIVE.

1. Given a SL-3 complete filled VHF radio, a preprogrammed net ID, and a distant station, while wearing a fighting load, operate a VHF field radio to establish communication with the distant station. (HSS-MCCS-1014)

ENABLING LEARNING OBJECTIVES

1. Without the aid of reference, and given a list, **identify VHF radio assembly procedures**, within 80% accuracy, per MCRP 3-40-3_ Multi-Service Communications Procedures. (HSS-MCCS-1014a)

2. Without the aid of reference, and given a list, **identify the procedures for conducting a radio check**, within 80% accuracy, per MCRP 3-40-3_ Multi-Service Communications Procedures. (HSS-MCCS-1014b)

1. **PHONETIC ALPHABET AND NUMERALS.**

   a. **The Phonetic Alphabet is Used to**:

       (1) The phonetic alphabet identifies spoken letters through a set of easily understood words in order to prevent the miscommunication of letters.

       (2) Each of these words begins with the letter being identified.

       (3) Transmit isolated letters such as "E7C", which is transmitted "ECHO 7 CHARLIE".

       (4) Transmit each letter of an abbreviation such as "MCT", which is transmitted "MIKE, CHARLIE, TANGO".

       (5) Spell unusual or difficult words such as "HOSE", which is transmitted "HOTEL OSCAR SIERRA ECHO".

   b. Each letter of the alphabet has the following corresponding pronunciation:

       (1) A=ALPHA

       (2) B=BRAVO

       (3) C=CHARLIE

       (4) D=DELTA

       (5) E=ECHO

       (6) F=FOXTROT

       (7) G=GOLF

       (8) H=HOTEL

       (9) I=INDIA

       (10) J=JULIET

       (11) K=KILO

       (12) L=LIMA

(13) M=MIKE

(14) N=NOVEMBER

(15) O=OSCAR

(16) P=PAPA

(17) Q=QUEBEC

(18) R=ROMEO

(19) S=SIERRA

(20) T=TANGO

(21) U=UNIFORM

(22) V=VICTOR

(23) W=WHISKEY

(24) X=XRAY

(25) Y=YANKEE

(26) Z=ZULU

c. **Phonetic Numerals**

(1) A specific pronunciation for numerals has also been established in order to avoid miscommunication.

(2) Numbers, such as those that make up the six-digit grid coordinates you used in your land navigation training are critical communication elements that must be clearly understood. The following are the pronunciations of the phonetic numerals 0 through 9:

(3) One **-** WUN

(4) Two - TOO

(5) Three - TREE

(6) Four - FOW-ER

(7) <u>Five</u> - FIFE

(8) <u>Six</u> - SIX

(9) <u>Seven</u> - SEV-EN

(10) <u>Eight</u> - ATE

(11) <u>Nine</u> - NINER

(12) <u>Zero</u> - ZE-RO

2. **<u>PROCEDURAL WORDS</u>**.

    a. Procedural words are words or phrases that have been assigned a meaning for the purpose of expediting tactical communication. Proper utilization of procedural words reduces the time required to communicate a message and helps to ensure concise communications. The following are essential procedural words and their definitions:

    (1) **<u>"TO…"</u>**. Indicates to the receivers the intended party for the message.

    (2) **<u>"THIS IS"</u>**. Alerts the receiver as to who is sending the transmission.

    (3) **<u>"OVER"</u>**. Alerts the receiver that the sender has ended his transmission and is awaiting a response from the receiver.

    (4) **<u>"OUT"</u>**. Alerts the receiver that the sender has ended his transmission and requires or expects no response/answer.

      OVER and OUT have different meanings. These two procedural words are never used together.

    (5) **<u>"ROGER"</u>**. Indicates to the sender that the receiver hears and understands the message or question.

    (7) **<u>"SAY AGAIN"</u>**. Indicates to the sender that the receiver did not receive or understand that last transmission and requests the transmission be repeated.

(a) The receiver may use the procedural words "ALL AFTER…" or "ALL BEFORE…" to communicate to the sender the specific portions of the transmission to be repeated.

(b) Do not substitute "REPEAT" for "SAY AGAIN". "REPEAT" is a procedural word specific to call for fire and should not be used in other contexts.

(8) **"I SAY AGAIN".** This alerts the receiver that the sender is resending the transmission or the portion requested.

(9) **"WAIT OVER".** This alerts the receiver that there will be a pause in the transmission and that he should wait for a few seconds.

(10) **"WAIT OUT".** This alerts the receiver that the sender requires a longer pause and that the receiver should stand-by for further communication from the sender.

(11) **"READ BACK".** This indicates to the receiver that he should resend the entire transmission back to the sender.

(12) **"I READ BACK".** Indicates to the sender that the receiver is reading back the transmission previously sent.

(13) **"CORRECTION".** This command alerts the receiver that the sender has made an error in his transmission. The sender will continue the transmission with the last word correctly sent.

b. **"RADIO CHECK".** This alerts the receiver that the sender requests a response indicating the strength and readability of his transmission. Conducting radio checks is necessary before any operation and should be conducted throughout the operation to ensure that both sender and receiver can communicate clearly to one another.

(1) To conduct a radio check, the sender will begin by calling the receiver and saying "Radio check, over."

(2) A response of "ROGER" indicates the transmission is loud and clear.

(3) A response of "WEAK BUT READABLE" indicates that the transmission is weak but can be understood.

(4) A response of "WEAK AND GARBLED" indicates that the transmission is weak and unreadable.

(5) A response of "STRONG BUT GARBLED" indicates that the transmission is strong signal but unreadable.

(6) The sender will then end the transmission by saying "Roger, out."

3. **CHARACTERISTICS AND COMPONENTS OF THE AN/PRC-152 FIELD RADIO**.

a. **Description.** The AN/PRC-152 provides multi-band, multi-mode operation. This enables a wide variety of applications for the user, including ground-to-ground, ground-to-air and tactical satellite communications. Over these links the type of communication traffic includes voice and data for command and control application. Since much of this information is highly sensitive, encryption is critical.

b. The AN/PRC-152 frequency range is continuous from 30.0000 MHz to 511.9999 MHz. In addition, some models offer High Band (HB) operation for VHF/UHF line of sight (VULOS) over the range of 512 MHz to 520 MHz and 762 MHz to 870 MHz. The radio supports AM, FM and various data waveforms.

c. The AN/PRC-152 is fully Joint Tactical Radio System (JTRS) compliant. Key JTRS compliance elements are as follows:

(1) Software Communications Architecture (SCA). The JTRS open standard software radio operating environment, Version 2.2.

(2) Programmable Crypto. The ability to load different encryption algorithms into the radio in an NSA certified method.

d. **Modes of Operation**

(1) VHF/UHF Line-of-Sight (VULOS). Provides fixed frequency communications over the VHF and UHR frequency bands. VULOS is also operable over dedicated UHF Satellite Communications (SATCOM) Channels.

(2) SINCGARS FH & SC. Single Channel Ground and Airborne Radio System (SINCGARS) Frequency Hopping operates in the VHF-LOW frequency range (30.0000 MHz to 87.9750 MHz). It

consists of two operating modes, Frequency Hopping and Single Channel.

      (a) <u>SINCGARS Frequency Hopping Net</u>. Uses a MASTER SINCGARS radio as the Net Control Station to maintain Time of Day synchronization and control SINCGARS net operational procedures. All other radios in the net are normally MEMBER stations. All AN/PRC-152 radios in a SINCGARS Frequency Hopping net must have the same VINSON Traffic Encryption Key and SINCGARS Eset programmed to the system preset.

      (b) <u>SINCGARS Single Channel Net</u>. Operates on a single fixed frequency in the VHF-LOW frequency range (30.0000 MHz to 87.9750 MHz.) This net can be used for Analog FM voice operations in Plain Text (PT), and Cipher Text (CT) voice operations.

   e. **Frequency Range**. The Frequency Range of the AN/PRC-152 is 30.0000 MHz to 511.9999 MHz with 1 Hz spacing per channel. The AN/PRC-152 has a planning range of up to 5 miles depending on varying factors such as atmospheric conditions, terrain considerations and environmental build up.

     (1) VHF Low Band- 30.0000 MHz to 89.9999 MHz

     (2) VHF High Band- 90.0000 MHz to 224.9999 MHz

     (3) UHF Band- 225.0000 MHz to 511.9999 MHz

   f. **Features**

     (1) Up to 99 programmable system presets (numbered 01-99) containing user-specified frequencies and operating parameters.

     (2) Built-In Test (BIT) for operational test, battery check, display firmware and hardware versions.

     (3) Internal Hold-Up Battery (HUB) to maintain programmed information when the AN/PRC-152 main battery is removed.

     (4) Automatic Scan Operation of both Cipher Text and Plain Text channels on Line-of-sight (LOS) fixed frequency or dedicated UHF SATCOM channels.

(5) Emergency Beacon Broadcast (90 MHz-511.9999 MHz) sends out emergency signal when you use this feature.

(6) This radio can be hand held or vehicle mounted.

g. **Components of the AN/PRC-152**

(1) <u>AN/PRC-152 Radio Assembly</u>. This Part of the Radio has the connectors, switches and buttons for programming the radio. It is the Receiver-Transmitter Unit (RTU)

(2) <u>Rechargeable Li-Ion Battery</u>. The Lithium-Ion Battery has a quick twist mount for easy connect and disconnect. Do not expose the battery to temperatures above 160 degrees as the battery can explode if it becomes too hot. Lithium-Ion Batteries should not be exposed to acid because this will contaminate the battery and damage it making it inoperable.
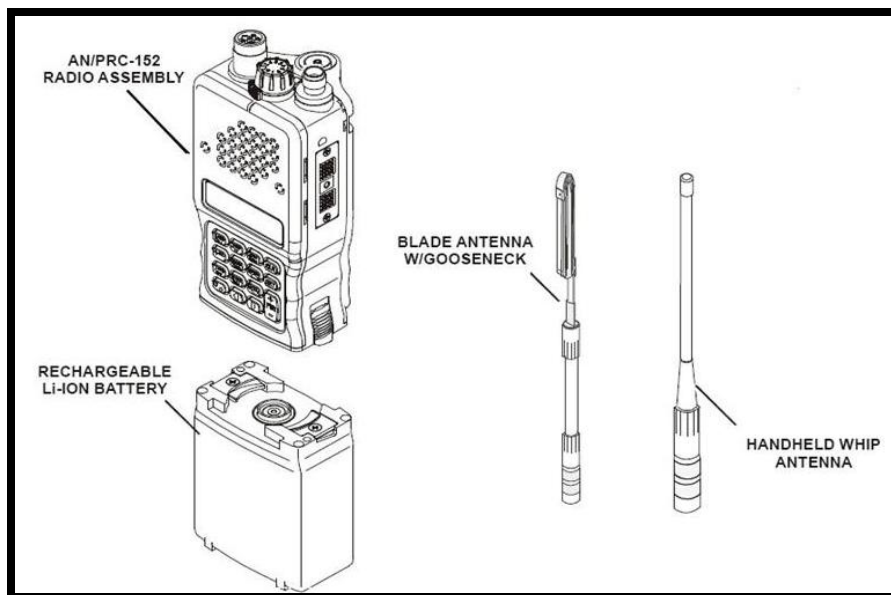

(3) <u>VHF/UHF or VHF Blade Antenna</u>. All antennas attach to the radio via the Threaded N-Connector (TCN) antenna connector. The VHF/UHF Blade Antenna is 45 inches in length and operational over VHF/UHF 30 MHz to 512 MHz frequency range. The VHF Blade Antenna is also 45 inches in length and operational over VHF 30 MHz to 108 MHz frequency range.

(4) VHF/UHF/HB Hand Held Antenna. This antenna attaches to the radio via the Threaded N-Connector (TCN) antenna connector. The VHF/UHF/HB Hand Held Antenna is 13 inches in length and is operational over the 30 MHz to 870 MHz frequency range.

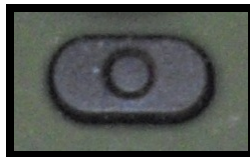(5) Picture of the AN/PRC-152 Components

(6) Accessory Carrying Bag. The accessory carrying bag is utilized to store accessories. Modular straps are sewn to the back to allow attachment to a pack, flak jacket or sapi plate carrier.

4. **CONTROLS, CONNECTORS, INDICATORS AND THEIR FUNCTIONS**.

   a. **Controls**

      (1) <u>Squelch Button</u>. Toggles squelch on and off when
pressed and released so the radio operator can listen to traffic
or noise that is present on the current frequency.

      (2) <u>Push To Talk (PTT) Button</u>. This button is used to key
a voice transmission for the radio. If the current waveform is
configured for voice, the radio will continuously transmit RF
over the air while the button is pressed. This button is still
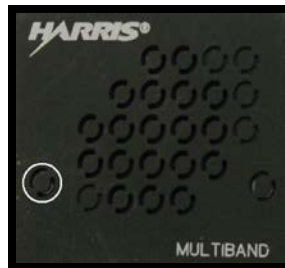functional even if a handset is connected to the radio.

      (3) <u>Volume Control</u>. Use the "up" arrow to increase the
volume. Use the down arrow to decrease the volume. This button

is not lockable. The volume "up" button will also initiate a
zeroize when the function knob is in the [Z] position.

    (4) <u>Microphone</u>. The AN/PRC-152 has a built in microphone
located next to the speaker.

    (5) <u>Cipher Switch</u>. The Cipher Switch has three options:
PT, LD, and CT.

        (a) <u>Plain Text (PT)</u>. This places the radio in Plain
Text, non-encrypted mode.

        (b) <u>Load (LD)</u>. This places the radio off-line,
ready to load COMSEC and Transmission Security (TRANSEC)
variables from an external Type-1 fill device.

        (c) <u>Cipher Text (CT)</u>. This places the radio in the
Cipher Text encryption mode.

    (6) <u>Functions Knob</u>. The Functions Knob has nine
selections on it; they are OFF, 1, 2, 3, 4, 5, S, F and Z.

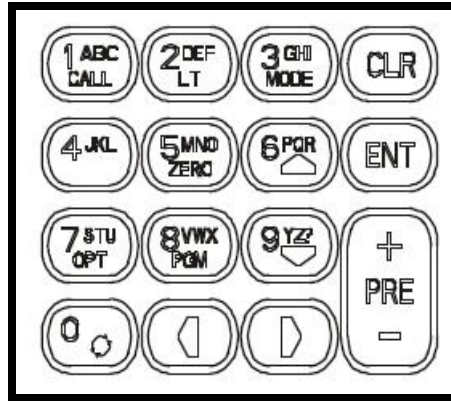   (a) [OFF] turns the radio off.

        (b) [1, 2, 3, 4, 5] selects system presets 1 through
5.

        (c) [Scan (S)] places the Radio in Scan Operation.

(d) [Front Panel (F) or (FP)] places the radio in Front Panel Mode, permitting access to all system presets and keypad functions.

(e) [Zeroize (Z)] zeroizes all programmed variables, including encryption variables.
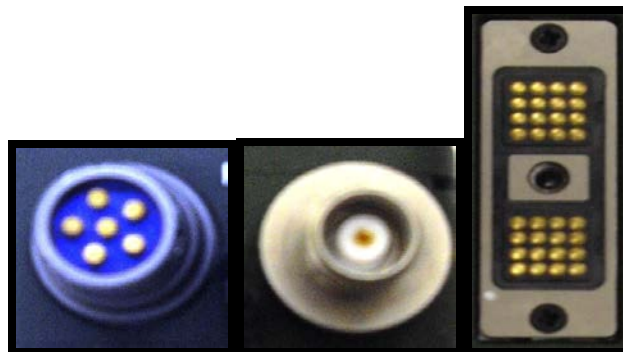
(7) <u>Keypad Layout</u>

b. **Connectors**

(1) <u>6-Pin Audio/Fill Connector</u>. The 6-Pin Audio/Fill Connector provides a connection for an optional H-250 handset or crypto fill device that uses a 6-pin connector.

(2) <u>Antenna Connector</u>. The Antenna Connector provides 50-ohm antenna port.

(3) <u>Side Connector</u>. The Side Connector provides an interface for various data devices.
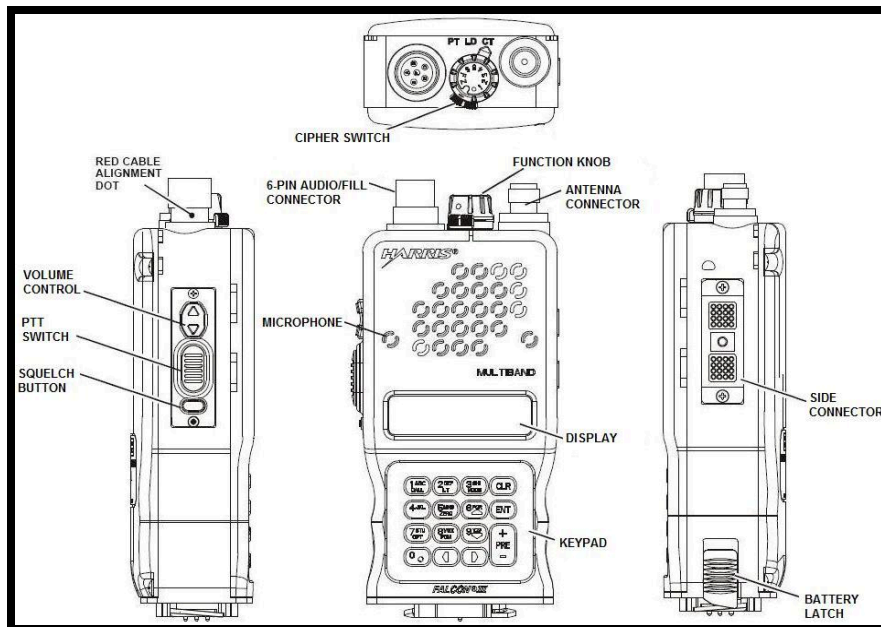

(4) <u>Battery Latch</u>. The Battery Latch slides up to unlock battery for removal from RT.

c. **Display Indicator.** The AN/PRC-152 display shows operational and programming screens.

d. **Picture of Controls, Connectors, Indicators and Functions**

5. **ASSEMBLE PROCEDURES.**

a. **Lithium-Ion Battery**. The Lithium-Ion battery has a quick twist mount for easy connect and disconnect. Attach a charged battery to the transceiver by seating the battery on the base of the radio at an angle to the base, and then twist the

battery into position in a clockwise direction as viewed from the bottom of the battery. The battery latch on the side of the radio snaps into the lock position when the battery is properly positioned on the radio.

b. **Antenna**. Screw either the whip or blade antenna to the TNC antenna connector. If operating in Satellite Communications mode (SATCOM), connect the optional SATCOM antenna cable to the AN/PRC-152 TNC antenna connector, and deploy the SATCOM antenna according to the separate instructions provided with the antenna.
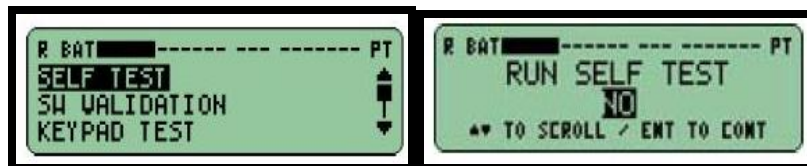
c. **Cipher Switch**. Rotate the Cipher Switch to [PT] or [CT] position.

d. **Function Knob**. Turn the function knob to [1] to [5] or [F] position. This initializes the AN/PRC-152 software and performs a power-on self test.

e. **Power-On Self Test (POST)**. When the radio is first turned on, the "HARRIS" logo screen is displayed, followed by the "FALCON III" screen. The initializing screen is displayed next and shows the radio's operating software version. This screen stays on till the radio finishes powering up. The next screen will be either POST FAILED or POST PASSED. If POST FAILED an audible warning will sound and user will be instructed to run a Self Test operation on the entire radio to determine more details about the component that caused the POST Failure.

f. **Self Test**. This runs the Built-In Test for all hardware modules. Press the (7) Key to go into the Test Options Menu, then do the following:

(1) Navigate to "TEST OPTIONS", press "Enter"

(2) Select "SELF TEST", press "Enter"

(3) Select "YES" for "RUN SELF TEST", press "ENTER"

(4) Once the test starts you will see a screen that says "TEST IN PROGRESS". The test may take up to one minute.

(5) You will see either a "TEST PASSED" (then you will press "ENT" or "CLR" to return to Main Menu) or a "TEST FAILED" screen indicating a specific module along with a fault code that can be referred to for trouble shooting.

REFERENCE(S):
TM 11619A/11   AN/PRC-152 Multiband Handheld   Chapters 3 and 4
622A/11690A/   Radio Operation Manual -12/2
TM 11496A   Intermediate Maintenance Manual Entire TM
-OI/2   for AN/PRC-152(C) Multiband Handheld Radio
MCRP 2-10A.7   Reconnaissance Reports Guide 131 Through 132
MCTP 3-01A   Scouting and Patrolling 14-1