RP 0506 - Field Communication

TERMINAL LEARNING OBJECTIVE

1. Given a tactical scenario, an AN/PRC 119 radio, operator maintenance equipment, accessory bag, material for expedient antenna, BA-4386 battery, and frequency assignment, prepare an AN/PRC 119 field radio set for operation to ensure AN/PRC 119 field radio set is operational. (RP00.05.13)
2. Provided an AN/PRC 119 radio, batteries, a frequency and a technical manual, communicate using AN/PRC 119 radio, to transmit and receive a message, per the student materials. (RP00.05.14)

ENABLING LEARNING OBJECTIVES

1. Without the aid of references, given a list, identify the components of the man-pack configuration of the SINCGARS radio, per the student handout. (RP00.05.13a)
2. Without the aid of references, given a list, identify the controls of the man-pack configuration of the SINCGARS radio, per the student handout. (RP00.05.13b)
3. Without the aid of references, given a list, sequence the procedures to load single channel frequencies on the SINCGARS radio, per the student handout. (RP00.05.13c)
4. Without the aid of references, given a list, identify the proper phonetic alphabet and numeric pronunciation, per the student handout. (RP00.05.14a)
5. Given a tactical scenario in a simulated combat environment and the necessary equipment, use the SINCARS radio to transmit field communications using proper radio procedures, per the student handout. (RP00.05.14b)

1. OVERVIEW

The Single Channel Ground & Airborne Radio Systems (SINCGARS) are radios in a family of VHF-FM combat net radios designed to provide the primary means of command and control for combat, combat service, and combat service support units.

2. FEATURES

Frequency Range - the SINCGARS operates in the VHF range from 30.000 to 87.975 MHz.

Range - one of the features of the SINCGARS radio is the operator's ability to select the power output of the radio by use of a selector switch. This feature allows you to reduce your electronic footprint by operating in a lower power or to reach far away stations using a higher setting. The switch has four positions: LO, M, HI, and PA. The maximum transmission ranges for each of the settings is as follows:

LO (low power) - 200 to 400 meters
M (medium power) - 400 meters to 5 kilometers
HI (high power) - 5 kilometers to 10 kilometers
PA (power amplifier) - 10 kilometers to 40 kilometers. Only vehicle-mounted radios equipped with a power amplifier can utilize this setting.

3. **MANPACK CONFIGURATION (AN/PRC-119A)** - The Manpack configuration is made up of the following components (see figure 1):

Receiver-Transmitter (RT) - common item of all of the configurations. The RT is actually the SINCGARS radio itself.
Handset - used for transmitting voice communication. The handset looks the same as the handsets you may have worked with operating other radios.
Manpack Antenna – transmits/receives the signals.
Battery Box - connects to the bottom of the RT and provides a housing for the battery that powers the RT in the Manpack configuration.
Battery - connects to a fitting in the battery box and supplies primary power to the RT for operation.
Field Pack - carries the RT and the components.

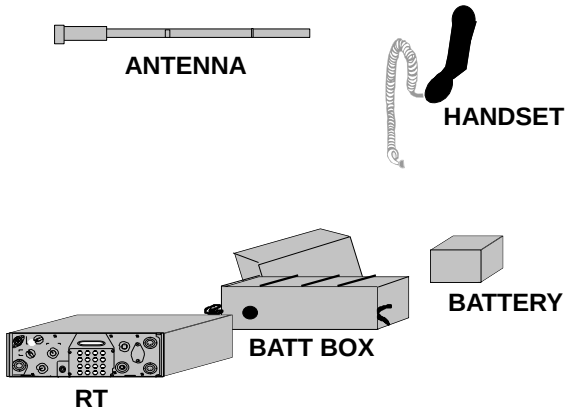


Figure 1. Manpack Components

4. **CONTROLS AND FEATURES**

Although the SINCGARS radio demands more of an operator besides turning the radio on, operator tasks primarily involve entering data using the keyboard, turning knobs and following instructions from the net control station. In order to operate the radio, operators need to understand terminology of the radio so when they receive instructions over the radio, they can follow them. Additionally, knowing the primary function of each control will aid the operator in achieving a properly functioning radio.

NOTE: Anytime the operator moves a switch to a setting with a box around the letters, the knob must first be pulled before it is turned. This feature ensures that the knob is not accidentally moved to another position.

Receiver-Transmitter (RT) - most of the controls that the operator will use are placed on the face of the RT (see figure 2).

FCTN (function) Switch - sets the RT function.
SQ ON (squelch on) - turns on the RT and the squelch. This feature will prevent the rushing noise from being heard in the handset/helmet. This is the normal operating position for the SINCGARS radio.

SQ OFF (squelch off) - turns on the RT but not the squelch. This position is used when communicating in the SC mode with radios having a different squelch system.

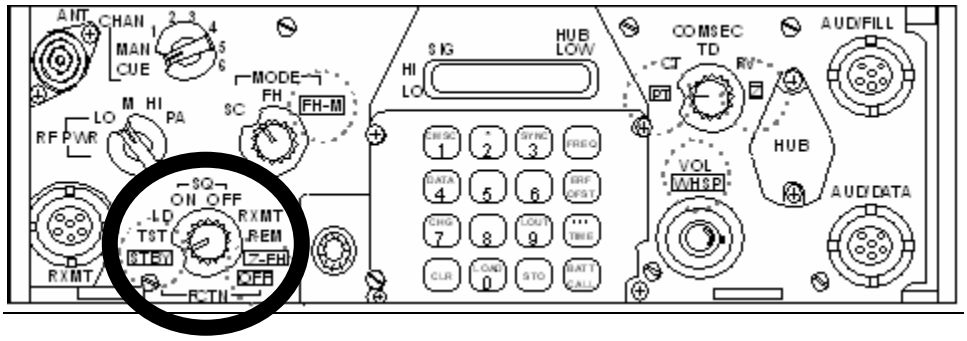


Figure 2. Face of Receiver

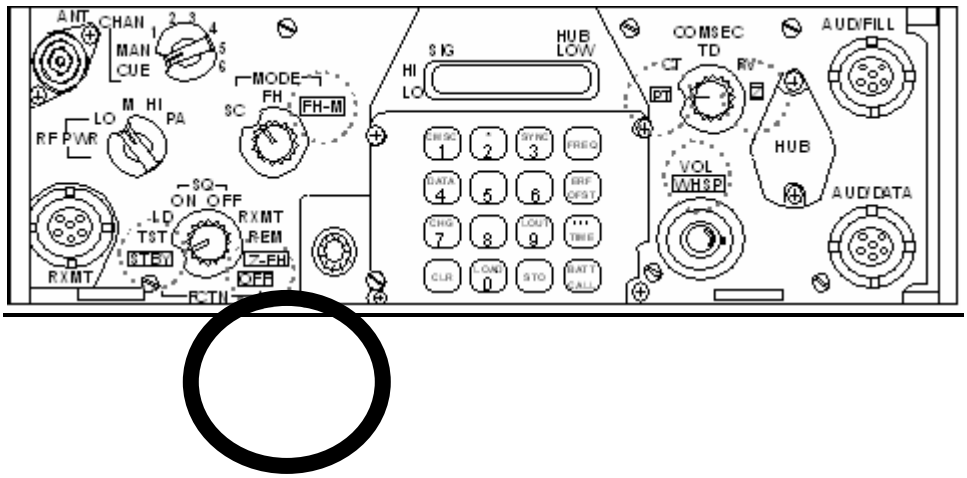
STBY (stand by) - cuts the primary (battery/vehicle) power to the RT. The RTs battery (hub battery) will maintain the memory of the radio including frequencies and times. This position is used as an alternative to OFF when the operator is concerned about conserving power during non-operating periods, but wants to retain all of the data loaded for operations occurring in the near future (same day).

TST (test) - conducts a self-test of its internal circuits. At the completion of the test, the radio will display results. Whenever the radio is put into operation, the operator should conduct a self-test.

LD (load) - allows the operator to load frequencies, data and COMSEC into the radio. In order to load any of this information into the radio for use, the operator must ensure that LD is positioned so the radio will receive the input.

OFF - turns off all of the power to the RT. When the radio is in the OFF position for more than five seconds, the memory is completely cleared. This switch is used when it is the operator's intent to take the radio completely out of action.

Mode Switch - sets the receiver-transmitter mode. The mode switch has three settings that allow the operator to select the mode of operation (see figure 3).



SC (single channel) - places the RT in the single channel mode of operation.

COMSEC Switch - sets the RT to the COMSEC mode. This switch has five (5) settings that allow the operator to use or manage COMSEC data (see figure 4).

PT (plain text) - placing the switch at this setting places the RT in the plain text, not a secure, mode of transmission.

CT (cipher text) - this setting allows the operator to use cipher, secure, transmissions when placed to this position.

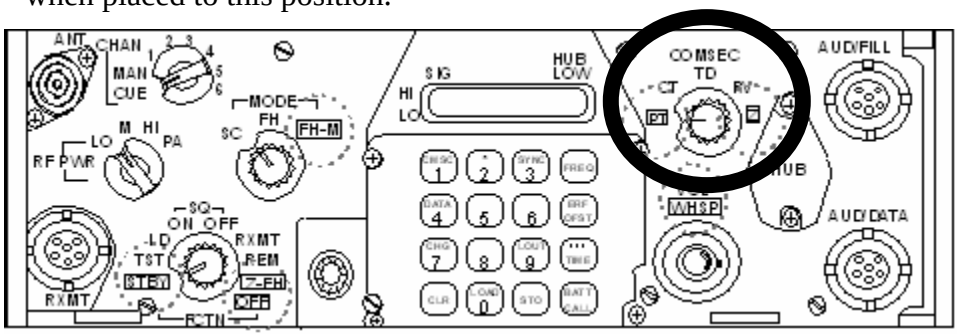


Figure 4. COMSEC Switch

CHAN (channel) Switch - selects manual, preset or cue frequencies. Operating this switch allows the operator access to any of the frequencies loaded into the channels. This switch is the means that the operator changes frequencies that are preset (see figure 5).

MAN (manual) - selects the loaded manual frequency. The manual frequency is used during FH operations and will be discussed later.

CUE - this setting selects the loaded CUE frequency. This frequency is also used in FH operations and will be discussed later.

1 through 6. These are the channels that may be loaded with operating frequencies or hopsets. COMSECs are also loaded into these channels.

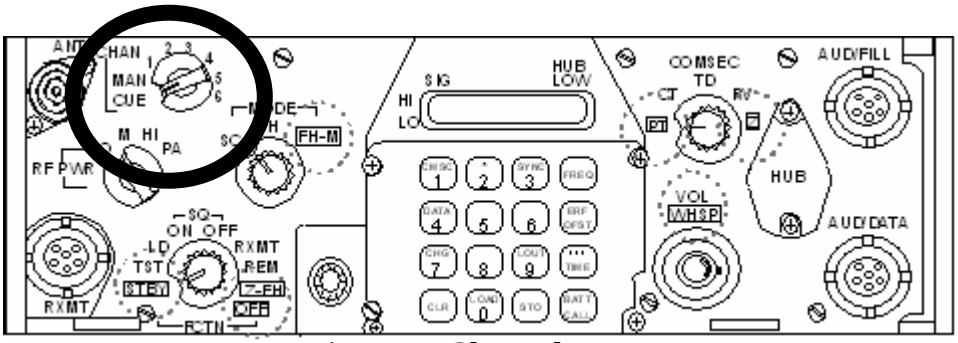


Figure 5. Channel

RF Switch - adjusts power level of transmissions. As earlier discussed, the SINCGARS has a variable power output. This is the switch that enables the operator to change the power output of the radio (see figure 6 a).

DIM Control - adjusts display brightness. The knob is turned clockwise to brighten the display and counterclockwise to dim the display (see figure 6 b).

VOL/WHSP (volume/whisper) control - adjusts audio volume. Clockwise increases volume, counterclockwise to decrease volume. Pulling the knob out allows the operator to receive as normal, but give the operator the additional feature of being able to talk very softly and still transmit (see figure 6c).

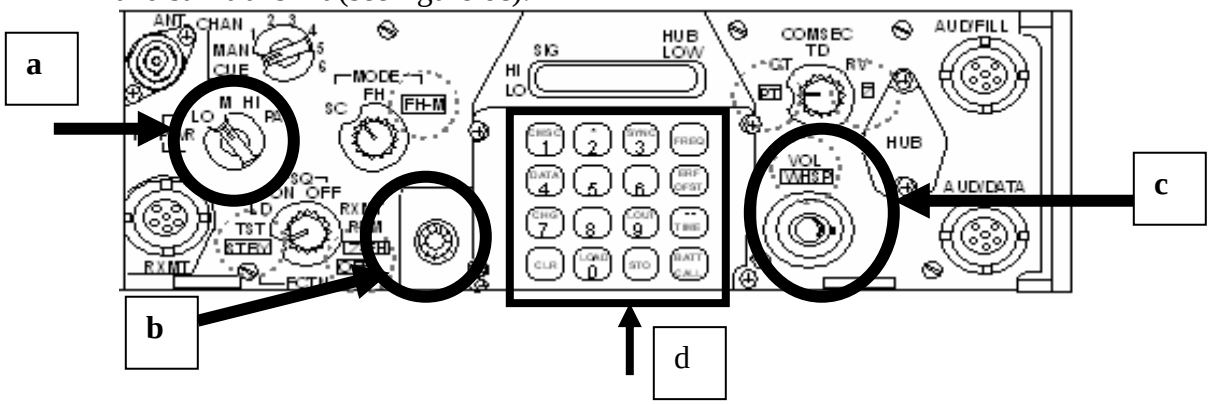


Figure 6. Face of Receiver/Transmitter

Keypad Display - used for entering, holding and checking data. By using the knobs and the keyboard in conjunction, the operator is able to complete all functions required when operating the radio. The keypad is laid out similar to a telephone keypad. Some of the keys have dual functions (see figure 6d).

FREQ (frequency) Button - used to check the data entered in the RT. Additionally, this button is used to load and clear the frequencies.

STO (store) Button - used for data loading. Pushing this button when required transfer data from the holding (temporary) memory to the permanent memory. When loading ERF data this button is used.

LOAD Button - used to load information into the holding memory and retrieve information from the permanent memory into the holding memory.

CLR (clear) Button - clears data from the keyboard display if a mistake was made.

Number Buttons - used to enter numerical data such as SC frequencies, and channel numbers.

AUD/FILL (audio/fill) Connector - located in the upper right corner. Connects to fill devices or handsets. When loading FH data or COMSEC data, the fill device is hooked to this connector via cable. Handsets can be attached to this connector as necessary.

AUD/DATA (audio/data) Connector - located in the lower right corner. Connects to external data devices during data operations and handsets during normal operations.

ANT (antenna) connector - located in the upper left corner. Connects to the manpack antenna or vehicle antenna cable. If the RT is to be functioning with PA, the antenna connector connects the RT to the PA. The PA will connect to the antenna.

5. ASSEMBLY OF THE AN/PRC-119

- Visually inspect battery box for dirt and damage. If the battery has been previously used, note battery life if it is written on the battery.
- Stand RT on front panel guards, place battery box on RT and secure it to latches
- Place battery in battery box and mate connectors

- Close battery box cover and secure latches
- Return radio in upright position
- Screw whip antenna into base, only hand tighten
- Carefully mate antenna base with RT antenna connector. Make sure you line up the grooves and only hand tighten. It is important not to tighten by other means.
- Attach handset by lining up red dots and then pressing and turning clockwise.

6. OPERATE SINCGARS IN THE SINGLE CHANNEL MODE

The most basic of SINCGARS operation is operating the radio in the single channel (SC) mode. When operating in the SC mode, the user is using the radio to communicate on a single frequency. The procedures for loading SC frequencies requires setting the proper switches, pressing the correct number keys and storing the information in the channel desired. As discussed earlier, the SINCGARS radio is capable of accepting up to 8 single channel frequencies. Those frequencies are loaded in the manual, cue and 1 through 6 channels. The procedures for loading frequencies into the channels are identical with the exception of which channel is selected during the procedure. The first channel we will load is the manual channel.

Loading SC Frequencies - following are the procedures for loading single channel frequencies. The procedures are to be performed in order. In order to load additional channels with frequencies, go to step (3), change to the desired channel and repeat steps (4) through (9). Continue repeating those steps for each new channel desired.

a. Set COMSEC switch to (PT) Plain Text prior to load

b. Set the mode switch to single channel (SC) - when loading single channel frequencies, the setting is appropriately set on SC.

c. Set channel switch to desired channel - this step is different for each channel loaded. This setting will change the manual frequency. Turn the channel switch to the desired channel to change other frequencies.

d. Set FCTN (function) switch to load

e. Press FREQ (frequency) button on keypad - this procedure displays the current frequency of the channel selected, or "00000" if there is not a frequency currently entered into the channel.

f. Press the CLR (clear) button - after pressing the FREQ button and displaying the current frequency, pressing the CLR button will clear that frequency and display five lines "_ _ _ _ _". At this point, the radio is ready to accept frequencies.

g. Enter the numbers of the new (desired) frequency - using the keypad, the display will show each number replacing a line as you enter the number. If you make a mistake, push the CLR button and the five blank lines will reappear. An important note is that if there is no keyboard action for 7 seconds, the display will go blank, and you will have to reenter the numbers.

h. Press the STO (store) button - the display will blink and the frequency you just entered is moved to the permanent memory in the channel selected.

i. Set function switch to SQ ON or OFF (squelch on) - placing the radio in SQ ON puts the radio into the normal SC operating position. Now the operator can call another channel using the handset.

Transmitting with the SINCGARS radio - when the push-to-talk button is activated (handset or helmet), the operator talks, and the radio transmit in the voice mode. The radio will transmit on the frequency that is entered into the channel that is selected on the channel switch. Transmissions should be no longer than 3 to 5 seconds.

Changing Channels - in order to transmit on a different frequency, the operator simply moves the channel switch to the channel containing the desired frequency. Each time that the channel switch is turned to a new channel, the frequency entered into that channel is displayed for the operator's reference.

Clearing Single Channels - when the radio is turned OFF for more than 5 seconds, the memory is cleared. If the operator desires to clear a SC of a frequency without turning the radio OFF, thus clearing all channels, the following procedures are used

- Set the MODE switch to SC
- Set the CHAN switch to the channel to be cleared. The frequency will be displayed allowing the operator to confirm that the frequency is to be cleared.
- Press the FREQ button
- Press the CLR button. The display will show five blank lines
- Press the LOAD button, the press the STO button. Pressing STO will enter NO, or a cleared, frequency into the RT.

7. PROPER TERMINOLOGY

Common Phrases

I say again - I am saying transmission again or portion indicated
This is - the transmission is from the station whose designator immediately follows
Wrong - your last transmission was incorrect
More to follow - stand by for more information traffic
Roger - information understood
Out - end of transmission, no response needed
Figures - numerals or numbers to follow
I spell - I shall spell the next word phonetically
Wait - I must pause for a few seconds
Word twice - communication is difficult, repeat each word twice
Correction - an error was made in this transmission
Disregard this transmission - forget last transmission
Over - the end of transmission, response is needed

Numbers

NUMBERS			
1- Won	**2- Too**	**3- Tree**	**4- Fo-wer**
5- Fife	**6- Six**	**7- Seven**	**8- Ate**
9- Niner	**10- Won Zero**		**0- Zero**

Phonetic Alphabet

PHONETIC ALPHABET

A - Alpha	**N - November**
B - Bravo	**O - Oscar**
C - Charlie	**P - Papa**
D - Delta	**Q - Quebec**
E - Echo	**R - Romeo**
F - Foxtrot	**S - Sierra**
G - Golf	**T - Tango**
H - Hotel	**U - Uniform**
I - India	**V - Victor**
J - Juliet	**W - Whiskey**
K - Kilo	**X - X-ray**
L - Lima	**Y - Yankee**
M - Mike	**Z - Zulu**

REFERENCES

SINCGARS Radio Operator's Manual, TM 11-5820-890-10-1
ITS, (May 2001), Pgs 1-19-5 through 1-19-6
Radio Operator's Manual, MCRP 3-40.33, Appendix C, D, E