

WAR DEPARTMENT TECHNICAL MANUAL

TM 11-620

RADIO SETS

SCR-608-A AND SCR-628-A

WAR DEPARTMENT • 1 JANUARY 1944

SECTION II. INSTALLATION AND OPERATION

17. Initial Procedure.

a. Unpacking. Check the containers *before* opening them. Be careful when unpacking or handling the equipment. Avoid damage. Carefully inspect each unit for damage incurred in shipment and for loose parts. Remove all dust covers and inspect the interiors. *Very carefully* blow or brush out any dust or dirt. If an air gun is used, *be sure* that the air is free from water, oil, and grit. *Avoid displacing or damaging any apparatus or wiring.* Manually check operation of the push buttons and other controls on each unit.

b. Preparation for Installation.

(1) Determine whether the vehicle battery is 12 or 24 volts and set the reversible voltage designation plate on the front of the mounting so that it properly describes the battery in use. (See Fig. 4.)

(2) Open the hinged door on the mounting and check for the presence of a 75-ampere fuse in the circuit and in the spare fuse clip on the door. (See Fig. 5.)

(3) Remove the unnecessary dust covers from the receptacles on the mounting and mount them in the positions provided at the back of the mounting.

(4) Using Table IV, select the proper dynamotor for installation in each of the units.

Table IV. Selection of Dynamotors

Unit in Which Dynamotor is Required	Dynamotor for Use With a Vehicle Battery of	
	12 Volts	24 Volts
Receiver	DM-34-(*)	DM-36-(*)
Transmitter	DM-35-(*)	DM-37-(*)

(5) Remove the dust cover from the receiver, insert the proper dynamotor in place, and make certain that the dynamotor receptacles properly engage the plugs on the receiver. Tighten the four hold-down screws of the dynamotor and replace the receiver dust cover.

(6) Remove the top cover plate from the transmitter. Take out the crystal storage drawer by pulling the drawer all the way out and lifting up the front end. Insert the proper dynamotor and make certain that the dynamotor receptacles properly engage the plugs on the transmitter. Tighten the four hold-down screws, using a long, thin screwdriver. Replace all parts that were removed.

(7) Open the cover of the transmitter crystal storage drawer and remove the crystal compartment cover plate. Check the number of crystal holders in both places. Do not remove any crystals found in the crystal compartment, since they will be used for subsequent installation tests.

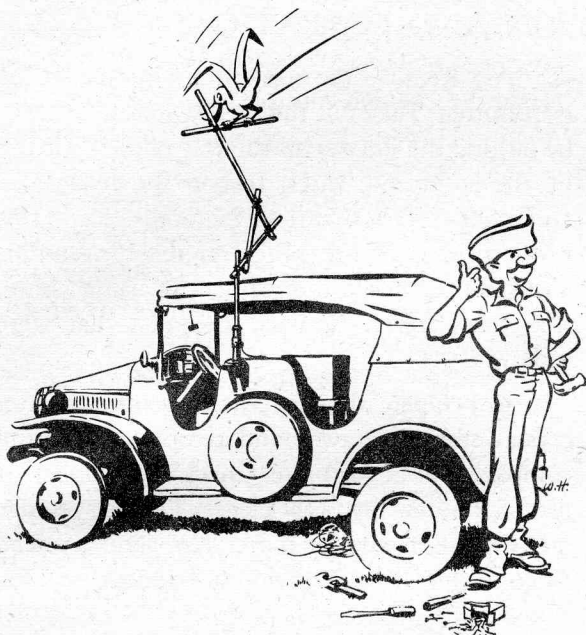
18. Installation.

a. Preparation of Vehicle. Detailed information on installation of the radio sets in various types of vehicles are to be found in the installation instructions for the particular type of vehicle concerned.

b. Installation of Equipment.

(1) *Check the vehicle battery and the battery designation plate on the mounting.* Shine up the contact areas around the mounting bolt holes on the mounting and the corresponding areas on the vehicle or the adapter plate to insure a good contact when the mounting bolts are tightened. *A good ground connection must be made at these points or the radio set will not function properly. Watch this.* Place the mounting in its assigned position with the bolt holes in the two bedplates aligned with the holes in the vehicle or the adapter plate. Select the required mounting bolts from the bolts furnished with the mounting and tighten them firmly in place.

(2) Install Cord CO-278-A, which connects the mounting to the vehicle terminal box, in the mounting in a manner to prevent its damage by personnel (especially by their feet) and by movement of the mounting on its shock absorbers. Three sets of holes in the mounting



DON'T DESIGN YOUR OWN ANTENNA!
- STICK TO WHAT'S RECOMMENDED

make possible the entrance of Cord CO-278-A from any one of three directions, as shown in Fig. 3. Use the holes which will result in the cleanest and shortest installation. The center conductor connects to the *positive* or ungrounded side of the terminal box. The outer conductor connects to the *negative* or grounded side of the terminal box. One end of the cord has smaller terminal lugs than the other end. Connect the smaller lugs to the mounting with the lug on the center conductor connecting to fuse F401 and the lug on the outer conductor connecting to the ground screw on the mounting (marked X in Fig. 5). *Do not connect the battery (terminal box) end of Cord CO-278-A without checking for accidental ground on the mounting. Check the polarity.*

(3) Antenna and ground connections differ somewhat for each type of vehicle, but make the installation in accordance with the general information contained in Paragraph 4a. The TR binding post on Mounting FT-237-(*) is used for the antenna connection when both transmission and reception are desired. Use the REC binding post for reception only.

(4) Check the dynamotor installed in the transmitter to make sure it is of the proper type

for the vehicle battery voltage. If not, replace the dynamotor with one of the proper voltage rating. Replace the cover plate. Place the transmitter on the mounting base with the push buttons toward the front of the mounting. Slide the transmitter to the left until the transmitter plug firmly engages the receptacle on the end of the mounting. The guides and tapered pins on the mounting properly align the transmitter as it is pushed into place. The two thumbscrews at the right-hand end of the transmitter may then be pressed down to engage the threaded holes in the mounting and firmly turned to the right to lock the transmitter in place.

(5) Make certain that the dynamotor installed in each receiver is correct for the vehicle battery employed. If two receivers are to be used (Radio Set SCR-608-A), they may be placed in either of the two positions on the mounting (see Fig. 1). When only one receiver is used (Radio Set SCR-628-A), place it in the right-hand position to give yourself enough room to get at the adjustments on the right end of the transmitter (see Fig. 2). Slide the receiver toward the rear of the mounting until its plug engages with the receptacle. The tapered pins properly align the receiver to engage the receptacle. Engage the cupped edges of the thumbscrews on the mounting with the hold-down brackets. Then tighten the thumbscrews.

(6) To install Remote Control Unit RM-29-D follow the instructions provided with this unit.

19. Preparation for Use.

a. Receiver.

(1) *Performance Check.* Here's how to check receiver performance:

(a) Turn the REC switch to ON and make certain that the receiver dynamotor starts. After about 15 seconds the vacuum tubes will be heated sufficiently for operation of the receiver.

(b) Set the SPEAKER switch to ON, the SQUELCH switch to OFF, and the OUTPUT TO PHONES switch to ON. Plug a Headset HS-30-

(*), HS-18, or HS-23 into one of the PHONE jacks.

(c) Turn the VOLUME control all the way to the right. If it's on the air, you should hear noise, or a signal, from the loudspeaker and in the headset. The volume of sound may be varied by adjusting the VOLUME control. The CALL SIGNAL lamp should light.

(d) Turn the SQUELCH switch to ON and observe the CALL SIGNAL lamp while turning the SENSITIVITY control. It should be possible to extinguish the CALL SIGNAL lamp by turning the SENSITIVITY control to the left; the CALL SIGNAL lamp may not always light when no signal is being received. The noise, or signal, from the loudspeaker should cease whenever the CALL SIGNAL lamp goes out.

(e) Turn the SQUELCH switch to OFF and listen to the noise while pressing the PUSH TO TUNE push button and operating the TUNING control. Noise or signals should be heard at any dial setting. An unmodulated signal (a station on the air but not talking) will sometimes cause a reduction of noise at one dial setting. The noise should increase as the dial is turned either side of such a station.

(2) *Receiver Antenna Tuning.* In making the following adjustments, place the receiver in the vehicle and connect the antenna. Don't let the antenna touch anything and locate your vehicle in the open, but *only* to the extent permitted by camouflage requirements.

(a) Install the receiver in the *right-hand* position on the mounting and set the ON-OFF switch to ON. The *left-hand* position must be vacant.

(b) Set the SQUELCH switch to OFF and the TUNE-OPERATE switch to OPERATE.

(c) Set the SPEAKER switch to ON. (If you wish you may use a headset instead of the loudspeaker, in which case set the SPEAKER switch to OFF and the OUTPUT TO PHONES switch to ON.)

(d) Release the push buttons (see Paragraph 7).

(e) Manually tune the receiver to a frequency near the high-frequency end where there

is *noise* (not a signal). To manually tune the receiver hold in the PUSH TO TUNE button and rotate the TUNING control.

(f) Adjust the VOLUME control so that noise is just audible.

(g) Adjust the antenna trimmer (accessible through port hole on left side of receiver) for maximum noise in your headset or loudspeaker. Use a small insulated screwdriver or an insulated hexagonal socket wrench.

(h) Set the ON-OFF switch to OFF.

b. Transmitter. Here's how to check transmitter performance:

(1) Remove the antenna lead from the antenna post on the mounting and connect Antenna A-83 between the TR binding post and the ground screw on the mounting.

(2) Connect either Microphone T-17 or T-33 to the transmitter.

(3) Throw the RECEIVER TUNE-OPERATE switch to OPERATE, and the TUNE-ANT CUR switch to ANT CUR.

(4) Turn the TRANSMITTER switch to ON and see that the pilot lamp lights.

(5) After about three seconds, depress a channel selector push button, and press the microphone switch. The transmitter dynamotor should start and the panel meter should show a deflection or movement. Release the microphone switch.

(6) Repeat step (5) on all remaining channels.

(7) Throw the TUNE-ANT CUR switch to TUNE and note the meter reading for each position of the METER SWITCH. The readings should agree approximately with those given in Table V. (See Paragraph 31e(11) for a detailed discussion.)

(8) Start an associated receiver, plug a Headset HS-30-(*), HS-18, or HS-23 into the receiver PHONES jack, and throw the OUTPUT TO PHONES switch to OFF. Operate the microphone push button and speak into the microphone. The

Table V. Meter Switch Readings*

Switch position	1	2	3	4	5	6
Circuit	Doubler Grid	First R-f Grid	Rectifier Grid	Tripler Grid	Power Amplifier Grid	Total Plate and Screen
Meter reading (27.0 mc)	30	30	20	20	15	65
Meter reading (38.9 mc)	20	25	25	25	15	65

*Transmitter RECEIVER TUNE-OPERATE switch at OPERATE.

speaker's voice should be heard in the headset. The headset volume may be adjusted to the desired level by turning the SIDETONE control on the end of the transmitter.

(9) Press in a channel selector push button on the transmitter, and throw the transmitter RECEIVER TUNE-OPERATE switch to RECEIVER TUNE. The transmitter dynamotor should start when this latter switch is operated.

Caution: Don't run the dynamotor for long periods. It may overheat.

(10) Manually tune the associated receiver to the transmitter channel frequency. Throw the SPEAKER switch to ON.

(11) Operate the microphone switch and speak into the microphone. The speaker's voice should be heard in the receiver loudspeaker at a receiver dial setting within about one-half a channel of the transmitter frequency. Restore the transmitter RECEIVER TUNE-OPERATE switch to OPERATE.

c. Frequency Check on Receiver Dial.

(1) Throw the transmitter and the receiver ON-OFF switches to ON.

(2) Throw the receiver TUNE-OPERATE switch to TUNE.

(3) Throw the SPEAKER switch to ON and turn the VOLUME control to the right.

(4) Throw the SQUELCH switch to ON and set the SENSITIVITY control to minimum.

(5) Latch (depress) corresponding transmitter and receiver push buttons.

(6) Set the transmitter RECEIVER TUNE-

OPERATE switch to RECEIVER TUNE. A beat note should be heard and the receiver dial setting should correspond to the transmitter frequency within one half a dial division.

(7) If a beat note is not obtained hold in the PUSH TO TUNE button and rotate the dial slightly to obtain a beat note.

(8) Repeat steps (5) through (7) for the remaining push buttons, noting all channels upon which note is not obtained.

(9) Reset all receiver and/or transmitter push buttons for channels upon which a beat note is not obtained (see Paragraph 21).

(10) If practical, check settings by establishing communication with another vehicle.

d. System Test. Whenever practicable, check operation of the installation by establishing communication with another radio set.

20. Operation. This paragraph describes procedures for placing the receiver and transmitter in operation, assuming that the push button selectors are adjusted to select the ten desired channels. If it is necessary to change the channels selected by the push buttons of the receiver or transmitter, follow the procedures in Paragraph 21 before operating the equipment.

a. Operation of the Receiver. You may operate the receiver with the SQUELCH switch at either ON or OFF. The squelch circuit controlled by the SQUELCH switch functions to disable the receiver output when no signal is being received; undesirable background noise is thus eliminated during "no-transmission" intervals.

(1) *SQUELCH Switch at OFF.* For loud-

speaker reception, throw the SPEAKER switch to ON, turn the VOLUME control to the extreme right, and throw the TUNE-OPERATE switch to OPERATE. For headset reception, plug the headset into a PHONES jack, throw the SPEAKER switch to OFF, turn the VOLUME control to the extreme left, set the TUNE-OPERATE switch to OPERATE, and the OUTPUT TO PHONES switch to ON.

To start the receiver, throw the REC switch to ON. It takes about 15 seconds for the vacuum tube cathodes to heat. If the receiver controls are set for loudspeaker operation, noise (or possibly a signal) will be heard when the tubes have heated. Regulate the volume with the VOLUME control. If the receiver controls are set for headset operation, and sufficient time has elapsed for the tubes to heat, noise (or a signal) will be heard upon advancing the VOLUME control.

Depress the push button corresponding to the channel upon which reception is desired. The TUNING adjustment is supplementary to the selector push buttons, the selector having previously been set to the desired channels. However, the receiver may be manually tuned to any desired channel by releasing all push buttons (see Paragraph 7) and adjusting the TUNING control while pushing the PUSH TO TUNE button. Tuning is facilitated in this case by throwing the TUNE-OPERATE switch to TUNE and adjusting the TUNING control for a beat note at the transmitter frequency. When the tuning is correct, restore the TUNE-OPERATE switch to OPERATE.

(2) *SQUELCH Switch at ON.* When the SQUELCH switch is at ON, the gain of the receiver may be varied by adjusting the SENSITIVITY control. (With the SQUELCH switch at OFF, the receiver operates at full gain and the SENSITIVITY control is inoperative.) When the squelch circuit is used (SQUELCH switch at ON), adjust the SENSITIVITY control for the highest possible gain without operation of the CALL SIGNAL lamp and loudspeaker (or headset) by radio noise. Incorrect adjustment of the SENSITIVITY control reduces the operating range of the receiver. If there is any doubt about the SENSITIVITY adjustment, throw the SQUELCH switch to OFF. When re-

ceiving weak signals throw the SQUELCH switch to OFF and leave it there. Don't take a chance. If it isn't adjusted on the nose you may miss incoming calls.

For proper adjustment with the SQUELCH switch at ON, set the SENSITIVITY control as far to the right as possible for satisfactory operation. When receiving a weak signal (as evidenced by static with the incoming signal) rotate the SENSITIVITY control carefully to the left until the CALL SIGNAL light just goes out as soon as the incoming signal goes off the air. The SENSITIVITY control setting is correct if the SQUELCH switch may be thrown off and on again without interrupting a weak signal.

b. Operation of the Transmitter. Here's how to put the transmitter in operation:

(1) Set the TUNE-ANT CUR switch to ANT CUR. (Large differences between the meter readings as observed during operation of the transmitter on various channels and the readings noted when the transmitter was tuned up indicate trouble.)

(2) Start the transmitter by throwing the TRANSMITTER switch to ON. Allow about five seconds for the tube filaments to heat.

(3) Plug Microphone T-17 or T-30 into the CARB MIC jack, or Microphone T-33 into the MAGNETIC MIC jack.

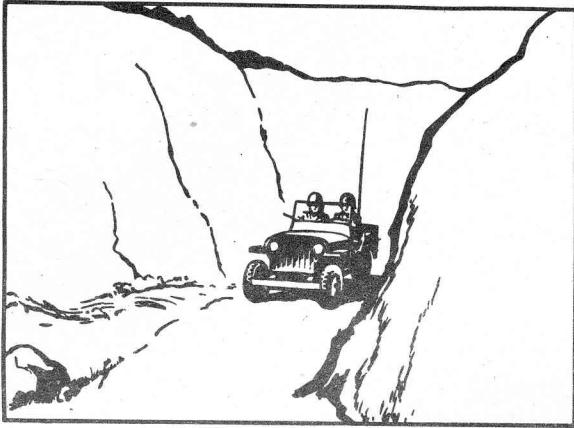
Caution: Always make sure a CHANNEL SELECTOR push button is depressed before pressing the microphone switch. Remember this.

(4) Put the transmitter "on the air" by *first* latching the CHANNEL SELECTOR push button corresponding to the desired channel, and *then* pressing the microphone switch.

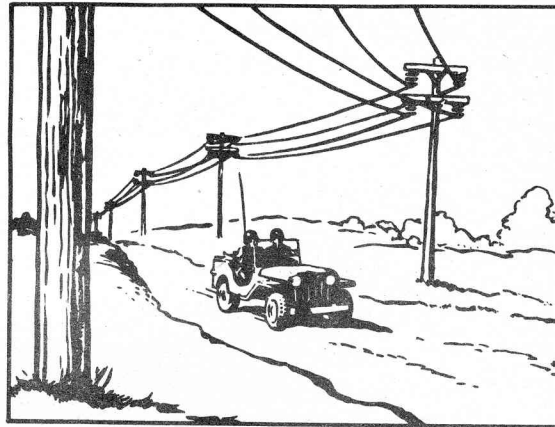
(5) Turn the TRANSMITTER switch to OFF when finished sending if the stand-by period is likely to exceed three or four minutes. This will prolong tube life.

c. Operation of the Remote Control Unit. For information regarding operation of Remote Control Unit RM-29-D, refer to Technical Manual TM 11-308 furnished with this unit.

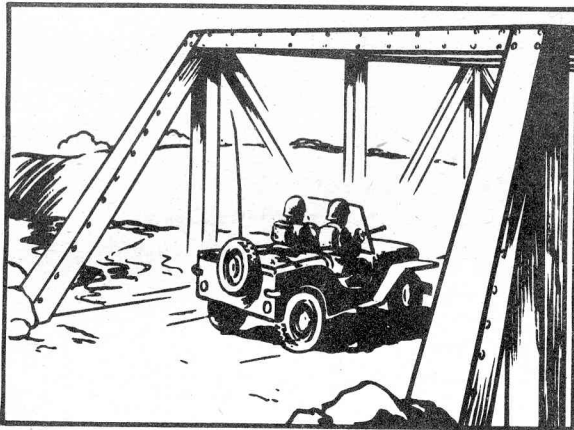
THESE PLACES ARE BAD FOR RADIO !



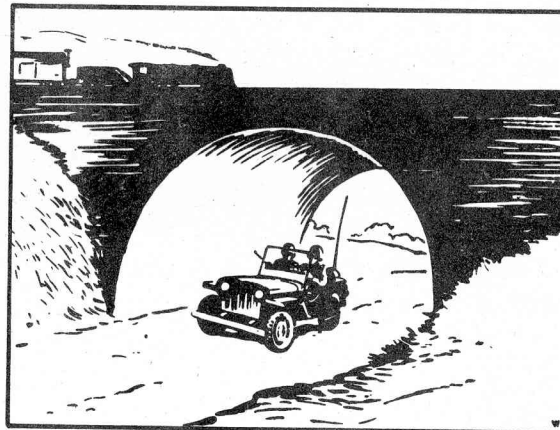
VALLEY



HIGH TENSION LINES

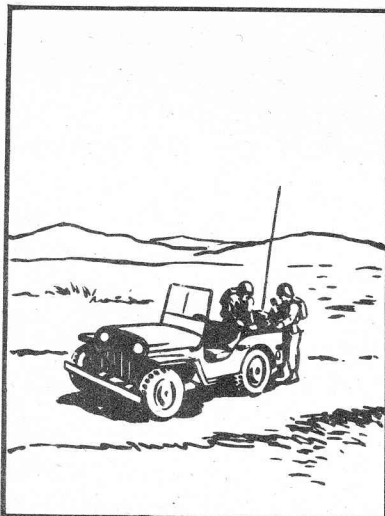


STEEL BRIDGE

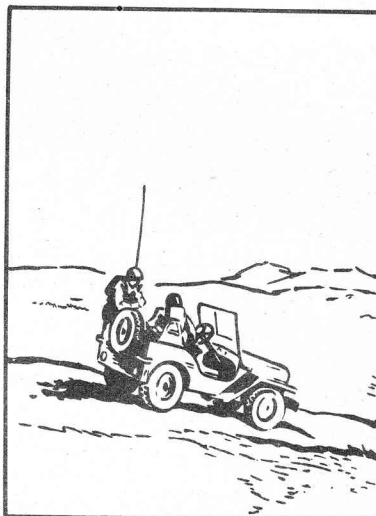


UNDERPASS

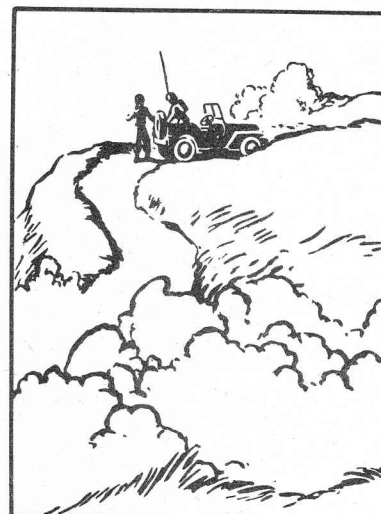
THESE PLACES ARE GOOD FOR RADIO !



LEVEL GROUND



SLIGHT RISE



HILL

d. Operating Precautions.

(1) *Transmission Conditions.* The range at which your radio set will work depends on terrain, interference, and radio noise. Under most conditions you should expect 5 to 7 miles *except* in valleys, and under or close to underpasses, overhead steel bridges, and other obstructions which box-in your signals.

Dips, depressions, valleys, and low places are poor for radio transmission and reception. The surrounding higher terrain tends to absorb radio energy.

Good places for sending and receiving are hills, elevations, and slight rises in ground. Flat terrain is also good. But avoid high-tension lines, overhead wires, and locations near electrical machinery which create interference and may blot out even the best of reception. In general, your radio works best in the clear.

You can conceal your vehicle under trees or camouflage, however. Trees and shrubbery won't cut your range. But don't let your aerial rest on



DON'T EXPECT DISTANCE FROM A VALLEY !



DON'T LET YOUR ANTENNA REST AGAINST BRANCHES! THEY'LL CUT YOUR RANGE..

branches or shrubbery when sending or receiving. They will leak off your radio power.

Here's another good operating tip to remember: When you come to the fringe of your operating range—say 10 miles out—static and ignition noise may begin to blot out your reception. If you can do it, try shutting off your vehicle's motor. You'll hear farther. But your battery must be well-charged as your radio draws heavily on it. Keep this in mind if you need a mile or two more range.

(2) *Overheating.* If the entire equipment is mounted in a tightly-enclosed space without enough ventilation, there is danger of overheating after extended periods of operation. Try to operate the equipment for as short intervals as practicable under such conditions.

(3) *Receiver.* Take care when using the squelch circuit and adjusting the SENSITIVITY control. Improper use of these features will result in seriously reducing the range of the set. If there is any doubt whatever about use of the SQUELCH, turn it to OFF and reduce the receiver output

volume sufficiently to prevent fatigue on long stand-by periods but not enough to prevent hearing a signal. Watch this. For weak signals and important incoming calls turn the SQUELCH to OFF and leave it at OFF. Don't take a chance.

(4) *Transmitter.* Always press a CHANNEL SELECTOR push button before starting the dynamotor by operating the microphone control switch or by throwing the RECEIVER TUNE-OPERATE switch to RECEIVER TUNE.

Operation of the transmitter filaments for long periods without application of plate voltage tends to evaporate the active material from their surface and reduce their useful life. Therefore, the TRANSMITTER switch should be at OFF if the transmitter is not to be used for an extended period.

(5) *How to Use Your Microphone.* These radio sets have been designed to work under noisy conditions such as in a tank or other noisy vehicle. To get best results, hold the microphone in a nearly vertical position with your lips just touching the surface. You don't have to shout; but it is necessary to make your voice go into the microphone at a higher level than the surrounding noise. Complete each word before starting the next and put a slight emphasis on all sibilants, such as c, s, and z, and terminal letters, such as t and g. *Speak slowly.* Although the equipment has been designed to reduce as much as possible the effects of the mechanical noise, these instructions will help you obtain satisfactory communication with a remote station, especially under poor receiving conditions. Remember, don't mumble away from your mike. Sound off, directly into it.

21. Presetting Push Buttons. Presetting the push buttons simply means tuning the channels ahead of time to the required frequencies and locking the settings, so from there on tuning may be accomplished by merely depressing the necessary push buttons. This process is exactly that used in a home "push button" radio. It's fast and simple to operate.

a. Presetting the Transmitter. The presetting

procedure is divided into two parts: First—setting the push buttons. Second—tuning the antenna circuit.

(1) *Setting the Push Buttons.* The push buttons may be set with the transmitter in the vehicle or removed. However, if the transmitter is removed a suitable source of d-c power and a Mounting FT-237-(*) or other means of connecting the source of power to the transmitter are required.

(a) Set the ON-OFF switch to ON. *Note.* Allow the transmitter to warm for five minutes before setting the push buttons. Perform steps (b) through (k) while waiting.

(b) Remove receivers. (If the receivers are to be preset also you can save time by leaving the right-hand receiver in position and setting its ON-OFF switch to ON.)

(c) Remove the crystal holders from the crystal compartment and put them in the crystal storage drawer.

(d) Select the required crystal holder for the new frequencies and insert them in the jacks of the crystal holder compartment in the prescribed order. (If no order is prescribed, insert them by numerical order of channel number from top to bottom of the compartment). If desired, write the corresponding channel numbers on the white spaces provided opposite the push buttons.

(e) Replace the crystal holder compartment cover.

(f) Release the push buttons by partially depressing one of them.

(g) Turn the tuning capacitor control (located below the handle on the right end of the transmitter; see Fig. 52), as far as it will go toward the front of the transmitter.

(h) Turn the locking screw (you can reach this with a screwdriver through a small hole located above and to the left of the handle see Fig. 52), to the left until it binds slightly then turn it to the right one-half turn.

(i) Turn the tuning capacitor control all the way to the rear (minimum capacity).

(j) Set the TUNE-ANT CUR switch to TUNE.

(k) Set the METER SWITCH to position 3.

(l) Latch the push button for the frequency to be set. You will find it easier to set the highest frequency (highest channel number) first.

(m) Then, if five minutes have elapsed since the ON-OFF switch was set to ON, start the dynamotor by setting the RECEIVER TUNE-OPERATE switch to RECEIVER TUNE.

Caution: Do not operate the dynamotor any longer than necessary. Always stop the dynamotor when any pause is made in the procedure. Don't let it overheat.

(n) Slowly turn the tuning capacitor control to the right until the panel meter indicates a peak value. Then continue to rotate the control for about one-eighth turn. If two or more peaks are obtained set the control for the highest one.

(o) Set the METER SWITCH to position 1 and carefully readjust the tuning capacitor control for the peak.

Caution: When the METER SWITCH is in position 1, the tuning capacitor adjustment is very critical and the control requires little or no change from the setting that was obtained for the highest peak in step (n).

(p) Stop the transmitter by setting the RECEIVER TUNE-OPERATE switch to OPERATE.

(q) Release the latched push button by slightly depressing an adjacent push button. While doing this step keep your finger on the button being released to prevent it from snapping out with such force as to disturb the setting.

(r) Repeat steps (k) through (q) for the remaining push buttons, preferably going each time from a higher to the next lower frequency channel.

(s) After the last push button is set, carefully release it. (Use two fingers.)

(t) Turn the tuning capacitor control to the maximum front position and tighten the locking screw.

(u) Check each push button setting by turning the METER SWITCH to position 1, depressing the push button, setting the RECEIVER TUNE-OPERATE switch to RECEIVER TUNE, and moving

the tuning capacitor control slightly. If the setting is correct the meter reading should decrease when the tuning capacitor control is moved slightly to *each* side of that position to which it has been set by the push button. Repeat steps (f) through (t) for all settings that are not correct.

(2) *Tuning the Antenna Circuit.* When tuning the antenna circuit use Antenna A-83 to prevent radiation. If Antenna A-83 is not available the transmitter must be in place in the vehicle, the mast antenna must not touch anything, and the vehicle should preferably be located well away from trees, trucks, and other large objects, but *only* to the extent permitted by camouflage requirements.

Caution: Never tune or operate the transmitter without the regular or a suitable artificial antenna (such as Antenna A-83) connected to the antenna post. Large currents developed in the antenna meter circuit with the antenna disconnected would burn out the thermocouple.

(a) Set the TUNE-ANT CUR switch to ANT CUR.

(b) Set the METER SWITCH to position 6. If the meter switch is not set to position 6 sufficient coupling may exist at some frequencies to cause the meter indicator to go off scale.

(c) Latch the push button for the frequency nearest 27 megacycles. (This is the best frequency upon which to tune the antenna for maximum output on the greatest number of frequencies. However, if it is definitely known that maximum output is desired on some particular frequency the coupling can be adjusted on that frequency, but *the coupling should be adjusted for one frequency only.*)

(d) Start the dynamotor with the push-to-talk switch on the microphone (RECEIVER TUNE-OPERATE switch at OPERATE).

(e) Adjust the antenna trimmer capacitor (see Fig. 14) that corresponds to the latched push button for maximum indication on the panel meter.

(f) Adjust the antenna coupling control (see Fig. 14) for maximum indication on the panel meter.

(g) Readjust the antenna trimmer capacitor that corresponds to the latched push button for maximum on the panel meter.

(h) Latch remaining push buttons one at a time and adjust the corresponding antenna trimmer capacitor for maximum on the panel meter. (Do not readjust the coupling control.)

Caution: Do not run the dynamotor any more than necessary.

(i) Make the frequency check outlined in Paragraph 19c.

(j) Remove Antenna A-83 (if used) and connect the mast antenna.

(k) If practical, check settings by establishing communication with another vehicle. (If desired, this check need not be made until after the receiver push buttons have been preset.)

b. Presetting the Receiver. The presetting procedure may be divided into two parts: First—setting the push buttons. Second—tuning the antenna circuit.

(1) *Setting the Push Buttons.* The push buttons may be set with the receiver in the vehicle or removed. However, if the receiver is removed a suitable source of d-c power and a Mounting FT-237-(*) or other means of connecting the source of power is required. An unmodulated signal at the frequency or frequencies to which the receiver is to be tuned must be available. The signal may be from either a remote transmitter or an associated transmitter. The changes necessary to adapt the procedure for use with a remote transmitter are obvious.

(a) Set the transmitter and receiver ON-OFF switches to ON. *Note:* Before setting the receiver push buttons the transmitter should warm up for at least 5 minutes and the receiver at least 15 minutes. If you had left the right-hand receiver in place, and it was warming while the transmitter was being preset, it would not be necessary to wait long. However, you may perform steps (b) to (h) while waiting.

(b) Release the receiver push buttons by partially pressing any one of them.

(c) Press the PUSH-TO-TUNE button and while holding it in, turn the TUNING control

toward the high frequency end of the tuning dial until the word LOCK appears under the hairline.

(d) Insert a screwdriver in the hole above the push buttons and turn the locking screw to the left until it binds slightly; then turn it right one-half turn.

(e) Set the receiver controls as follows:

(1) SPEAKER switch to ON. (You may use a headset instead of the loudspeaker if you wish.)

(2) VOLUME control about two thirds to the right.

(3) SENSITIVITY control to minimum (to the left position).

(4) SQUELCH switch to ON.

(5) TUNE-OPERATE switch to TUNE.

(f) If a second receiver is to be preset, place it in position and make the following settings. (These settings are necessary to eliminate all probability of interference by this receiver.)

(1) ON-OFF switch to ON. (Allow the receiver to warm up.)

(2) SPEAKER switch to OFF.

(3) SENSITIVITY control to minimum.

(4) TUNE-OPERATE switch to OPERATE.

(5) Rotate the dial to its LOCK position.

(6) SQUELCH switch to ON.

(7) OUTPUT TO PHONES switch to OFF.

(g) Latch the transmitter push button for the frequency to be set. (The procedure is made easier if the lowest frequency is set first.)

(h) Then if 15 minutes have elapsed since the ON-OFF switch on the receiver to be preset first was set to ON, turn the transmitter RECEIVER TUNE-OPERATE switch to RECEIVER TUNE.

(i) Hold in the PUSH-TO-TUNE button on the receiver to be preset first and turn the TUNING control until the receiver is tuned to the transmitter frequency as determined by a beat note and the setting of the dial which should correspond to the transmitter frequency. If the setting of the dial does not correspond to the transmitter frequency it is probable that the receiver is tuned to a harmonic or that the transmitter is incorrectly preset.

(j) Hold in the PUSH-TO-TUNE button and latch the receiver push button corresponding to the transmitter frequency.

(k) Slowly release the PUSH-TO-TUNE button while rotating the TUNING control just enough in either direction to maintain approximately zero beat (very low pitched note).

(l) Press the latched push button against its stop two or three times. If the beat note is still very low-pitched depress an adjacent push button slightly and carefully ease the latched push button out. (Use two fingers.)

(m) If the setting is still correct turn the transmitter RECEIVER TUNE-OPERATE switch to OPERATE.

(n) Repeat steps (g) through (m) for the remaining push buttons, preferably each time going from a lower to a higher frequency.

Caution: Always stop the transmitter dynamotor during any pause in the procedure.

(o) After the last push button is set, carefully release it (using two fingers) and rotate the dial to the LOCK position.

(p) Lock the setting by tightening the locking screw. The screw should be firmly tightened but not enough to damage the push-button mechanism.

(q) Make the frequency check outlined in Paragraph 19c.

(r) Set the controls for operation as follows:

(1) TUNE-OPERATE switch to OPERATE.

(2) Adjust the SENSITIVITY control so the CALL SIGNAL lamp just goes out when no signal is being received. (See Paragraph 20a.)

(s) If practical, check settings by establishing communication with another vehicle.

(2) *Tuning the Antenna Circuit.* You must tune the receiver antenna circuit when the set is first installed in the vehicle. Ordinarily it will not require tuning again unless you make some change in the antenna. You can tune it before setting the push buttons if you wish. See Paragraph 19a(2) for the prescribed method of tuning the antenna circuit.

REMEMBER THESE NINE POINTS—

1. Keep your antenna vertical. It sends and receives better that way. Be sure you use the right number of sections.
2. Don't talk away from your mike. Speak directly into it. Sound off!
3. If you want distance, head for the high spots. Watch out for steel bridges, valleys, dips, and low places. Your radio will work, but not so far.
4. Conceal your vehicle but don't let your antenna rest against tree branches when sending or receiving. They will leak off your radio power.
5. Watch out for the SQUELCH switch. For weak signals or important calls, turn it off and leave it off. Play it close to the vest.
6. Don't let your radio sit out in the rain. Try to cover it. Rain may ruin radio equipment in a hurry.
7. Don't install your radio in a tightly inclosed space. Give it air.
8. Don't run your dynamotors unnecessarily long. They get hot and, abused, may burn out.
9. The operation of your set is basically simple. Practice it a few times and it will become second nature.

22. System Operation.

a. *Radio Set SCR-608-A.* Each radio set may transmit on any one of 10 preset channels and receive on any one of 20 preset channels. Two-way communication between two radio sets may be established by use of a single channel or by use of two channels.

The radio set may be used in either of two communications systems: (1) radio communication only, or (2) radio-plus-wire telephone communication. In the first instance the radio equipment needs no auxiliary apparatus other than Microphone T-17, T-30, or T-33 and Headset HS-30-(*), HS-18, or HS-23. In the second instance Remote Control Unit RM-29-D is used to connect a remotely located field Telephone EE-8-(*) to the radio equipment. Figure 23 shows a system block diagram.

(1) *Radio Communication Only.* When the two ends of the radio system (5 to 15 miles apart) have been placed in operating condition, it is necessary only to choose the channel frequency by pressing the proper channel selector button on the respective radio transmitter and radio receiver and press the microphone control switch when transmission is desired.

(2) *Radio-Plus-Wire Telephone Communication.* In this case the twisted pair from the remotely located field Telephone EE-8-(*) is connected to the L1 and L2 binding posts of Remote Control Unit RM-29-D, and Plugs PL-55 and PL-68 of the RECEIVER and MICROPHONE cords, respectively, are inserted into the receiver PHONES and the transmitter CARB MIC jacks. The radio operator's Headset HS-30-(*), HS-18, or HS-23 and Microphone T-17 or T-30

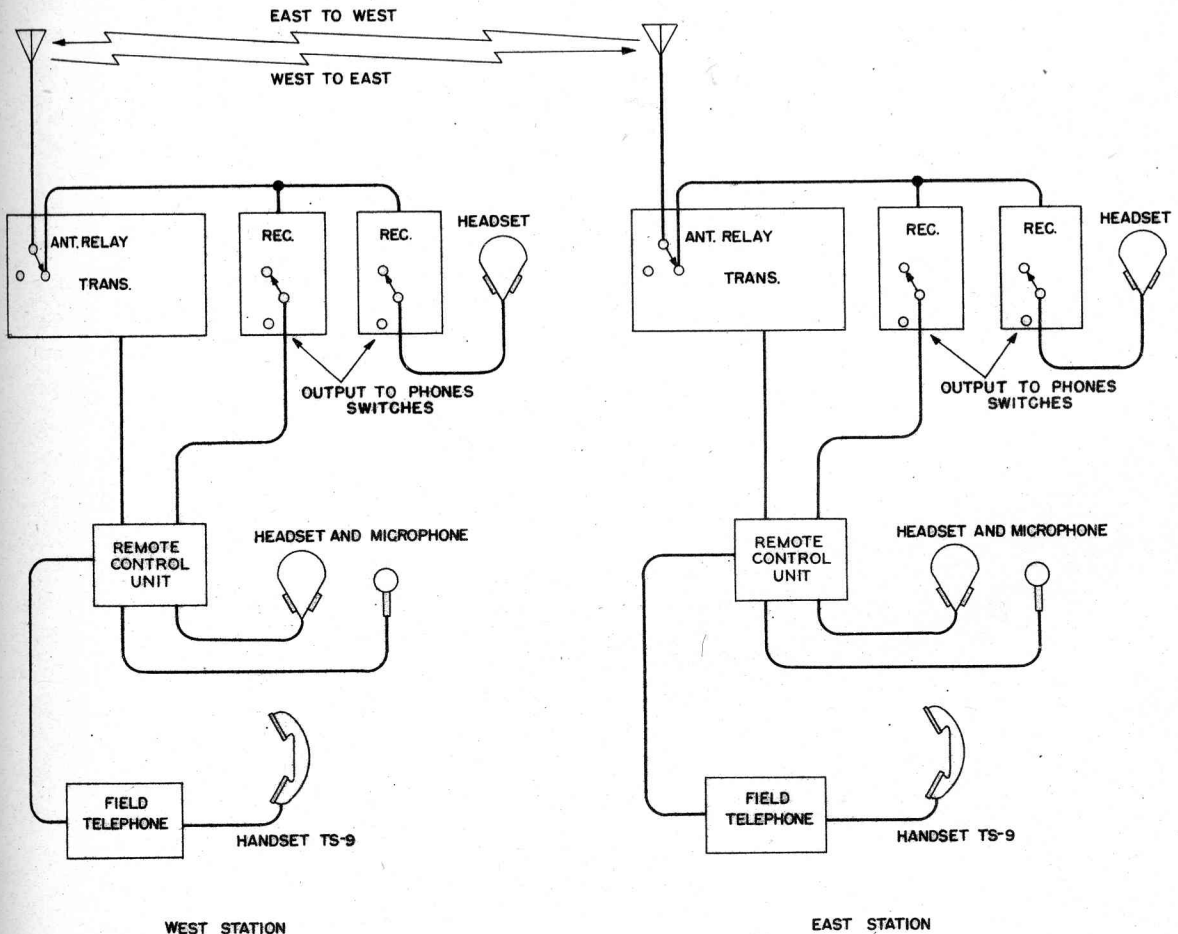


Fig. 23. Radio Set SCR-608-A: System Block Diagram

are plugged into the HEADSET and MICROPHONE jacks on Remote Control Unit RM-29-D. The radio operator may communicate with the field telephone operator by throwing the three-position key to TELEPHONE. The ringing generator and ringer are connected at all times and are operative regardless of the position of the three-position key. When the key is at TELEPHONE, the radio equipment is disconnected from the telephone line and from the radio operator's headset and microphone. When the local operator wishes to communicate with the distant field operator, he may do so by throwing the three-position key to RADIO and pressing the microphone push button while speaking. Operation of the key to the RADIO position disconnects the wire line from the radio equipment and from

the local operator's headset and microphone. When the three-position key is at THROUGH, the field telephone is connected to the radio transmitter and the radio receiver, and the local operator's microphone is rendered inoperative except for the push button switch mounted thereon. The field telephone operator cannot start the radio transmitter when he desires to talk and it is necessary, therefore, for the local operator to monitor all conversations and press and release his microphone push button as required by the two speakers.

b. Radio Set SCR-628-A. This radio set operates exactly like Radio Set SCR-608-A except that it is only possible to receive on 10 channels instead of 20, since there is only one receiver.