

SECTION 6

RADIO SETS AN/MRC-36, -37, AND -38

47. **Purpose and Use.**—a. The radio sets described in this section provide frequency-modulated radiotelephone facilities within the frequency range of 20.0 to 54.9 megacycles. The frequency range of each set in relation to that of other radio sets is shown in the frequency spectrum chart, Appendix B.

(1) As with other type sets covered in this text, the basic similarities of Radio Sets AN/MRC-36, -37, and -38 allow simultaneous treatment of these sets in most instances. The over-all systems are referred to collectively as the **radio set**.

(2) The terms **Set 1** and **Set 2** are used in this section to designate the two receiver-transmitters included in each of the radio sets. Set 1 may be any one of Receiver-Transmitters RT-66/GRC, RT-67/GRC, and RT-68/GRC; the particular Set 1 which is used in each of the radio sets is listed in Paragraph 48. Set 2, as used in this section, always refers to Receiver-Transmitter RT-70/GRC.

(3) The term **Set 1 power supply** is used to designate either Power Supplies PP-109/GR and PP-112/GR which may be used to supply operating voltages for the Set 1 receiver-transmitters. The battery voltage available, 12 or 24 volts, determines which power supply must be used.

(4) AF Amplifier AM-65/GRC, a common component of all the radio sets, is referred to in this section as the **interphone amplifier**.

(5) The term **auxiliary receiver** is used to designate any one of the Radio Receivers R-108/GRC, R-109/GRC and R-110/GRC.

(6) The term **Set 2 power supply** designates either Power Supply PP-281/GRC or PP-282/GRC which is used to supply operating voltages for the Set 2 receiver-transmitter and the interphone amplifier in all of the radio sets and for the auxiliary receiver. Again, the battery voltage available, either 12 or 24 volts, determines which power supply must be used.

(7) To identify the various control units of the radio sets, the following terms are used: Control Box C-375/VRC is referred to as the interphone box; Local Control C-434/GRC is referred to as the **local control unit**; Remote Control C-433/GRC is referred to as the **remote control unit**; and Control C-435/GRC is referred to as the **retransmission unit**.

b. The radio sets can be installed and operated in trucks, personnel carriers, tanks, armored utility vehicles, weapons carriers, and other authorized vehicles. They are

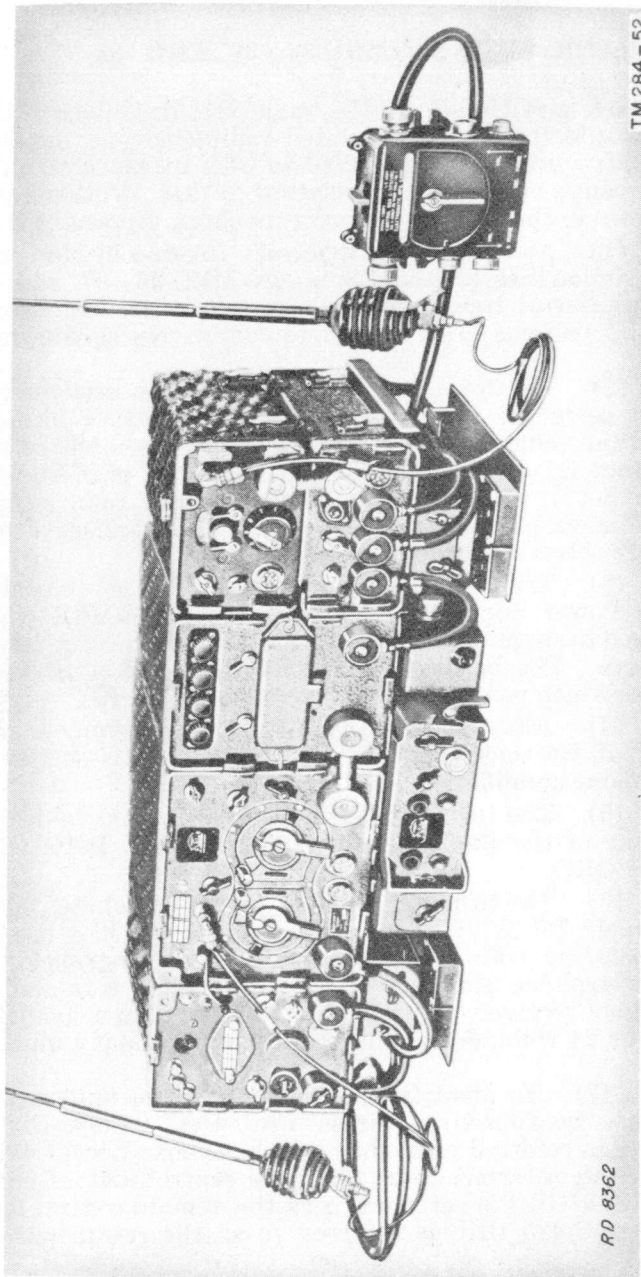


Figure 39.—Radio Set AN/MRC-36, removed from vehicle.

designed primarily for short-range operations within and between tank, artillery, and infantry units. Specifically, Radio Set AN/MRC-36 is intended for the use of tank units; Radio Set AN/MRC-37 is for artillery units; and Radio Set AN/MRC-38 is for infantry units. Liaison communication between different type units is provided by Receiver-Transmitter RT-70/GRC, which is common to all of these radio sets.

48. Technical Characteristics.—a. The radio sets provide for transmission and reception of both voice and 1,600 cycle FM signals. The frequency range of each of the sets is shown below:

Radio Set	Set 1	Set 2	Auxiliary Receiver
AN/MRC-36	20 to 27.9 mc	47 to 58.4 mc	20 to 27.9 mc
AN/MRC-37	27 to 38.9 mc	47 to 58.4 mc	27 to 38.9 mc
AN/MRC-38	38 to 54.9 mc	47 to 58.4 mc	38 to 54.9 mc

b. The operational facilities of the radio sets provide for:

Push-to-talk operation from local or remote control stations.

Interphone facilities.

Automatic retransmission of received signals.

Full-duplex radio operation.

Full-duplex telephone circuit between local and remote control units.

Remote (as well as local) control of power.

c. Continuous tuning is possible on both Set 1 and Set 2 and also on the auxiliary receiver. In addition to the continuous tuning available in Set 1, a choice of detented channels (80, 120, and 170 for Receiver-Transmitters RT-66/GRC, RT-67/GRC, RT-68/GRC, respectively) at every 100 kc of the tuning range is possible; provision is also made for presetting any two of the detented channels. Set 2 also has continuous tuning and detent provisions for preselection of any two frequencies. The auxiliary receivers have detent provisions for preselection of any three frequencies in addition to the continuous tuning provisions.

d. The operating range of Set 1 is approximately 10 miles. The rated output of the transmitter is 1 to 2 watts on low power and 9 to 16 watts on high power. Set 2 has an operating range of approximately 1 mile with a rated output of $\frac{1}{2}$ watt.

e. A composite table of components for all the radio sets is presented in Figure 40. The table includes components of the basic sets only.

Component	Radio Sets		
	Radio Set AN/MRC-36	Radio Set AN/MRC-37	Radio Set AN/MRC-38
Receiver-Transmitter RT-66/GRC	1		
Receiver-Transmitter RT-67/GRC		1	
Receiver-Transmitter RT-68/GRC			1
Receiver-Transmitter RT-70/GRC	1	1	1
Radio Receiver R-108/GRC	1		
Radio Receiver R-109/GRC		1	
Radio Receiver R-110/GRC			1
AF Amplifier AM-65/GRC	1	1	1
Power Supply PP-281/GRC or PP-282/GRC	2	2	2
Power Supply PP-109/GR or PP-112/GR	1	1	1
Control Box C-375/VRC	1	1	1
Control Group AN/GRA-6	1	1	1
Control C-435/GRC	1	1	1
Mounting MT-297/GR	1	1	1
Adapter UG-273/U	2	2	2
Adapter UG-306/U	2	2	2
Bag CW-206/GR	1	1	1
Special Purpose Cable WM-46/U	1	1	1
RF, Cable Assembly CG-568/U	1		
RF, Cable Assembly CG-530/U	1	2	2
Special Purpose Cable Assembly CX-1211/U	1	1	1
Special Purpose Cable Assembly CX-1213/U	1	1	1
Case CY-684/GR	1	1	1
Connector and bondnut	1	1	1
Mast Section MS-116-A	2	2	2
Mast Section MS-117-A	2	2	2
Mast Section MS-118-A	2	2	2
Mast Section AB-22/GR	2	2	2
Mast Section AB-24/GR	2	2	2
Mast Base AB-15/GR	2	2	2
Wire W-142	2	2	2
Technical Manual (TM 11-284)	1	1	1
	2	2	2

Figure 40.—Table of Components, AN/MRC-36, -37, and -38.

49. **General System Description.**—a. Radio Set AN/MRC-36, Figure 39, is typical of the sets discussed in this section. The table of components, Figure 40, and the system cordage diagram, Figure 50, are helpful in the understanding of the various systems.

b. All of the basic radio sets have the following items in common:

(1) Two receiver-transmitters, an interphone amplifier, suitable power supplies, and an auxiliary receiver.

- (2) A mounting.
- (3) Four control units.
- (4) Suitable antenna systems and interconnecting cables.

c. Figure 39 shows the major components of Radio Set AN/MRC-36 connected to simulate an operating installation. Receiver-Transmitter RT-66/GRC is utilized as Set 1; Power Supply PP-112/GR furnishes operating voltages for Set 1; Receiver-Transmitter RT-70/GRC is Set 2; and AF Amplifier AM-65/GRC is the interphone amplifier. Operating voltages for Set 2 and the amplifier are furnished by a plug-in power supply unit (Power Supply PP-282/GRC) contained within the amplifier. All of the above mentioned units are secured on Mounting MT-297/GR which is normally bolted to a vehicular mounting surface. The mounting also accommodates one of the control units (either Local Control C-434/GRC, pictured, or Control C-435/GRC) as a plug-in unit. From the mounting, connections are made to the vehicular battery, to the major units supported on the mounting, and to one or more Control Boxes C-375/VRC. When the local control unit is plugged into the mounting as shown, connection is made to Remote Control C-433/GRC by telephone wire. Connections to the antenna systems are made directly from the panels of the Set 1 and Set 2 receiver-transmitters.

d. The system described above is applicable to vehicles which have a 24-volt storage battery. To adapt the system for 12-volt operation, Power Supplies PP-109/GR and PP-281/GRC must be substituted for Power Supplies PP-112/GR and PP-282/GRC, respectively. Either installation constitutes a basic AN/MRC-36.

e. If Receiver-Transmitter RT-67/GRC or RT-68/GRC is used as Set 1 and the antenna system for Set 1 is changed as indicated in Figure 50, the basic installation becomes Radio Set AN/MRC-37 or Radio Set AN/MRC-38, respectively.

f. Radio Receiver R-108/GRC is used in the basic system described in c above. Substitution of Radio Receiver R-109/GRC or R-110/GRC for Radio Receiver R-108/GRC (along with the Set 1 and antenna substitutions of e above) changes the system to Radio Set AN/MRC-37 or Radio Set AN/MRC-38, respectively.

50. Set 1 Receiver-Transmitter.—a. The receiver-transmitters used as Set 1 in these radio sets are very similar in structure, function, and detailed circuit and mechanical arrangement. They differ from each other only in their operating frequency ranges and in the components which determine the frequency range. Hence, Receiver-Transmitter RT-66/GRC is externally similar to the other receiver-transmitters except for the calibrations of the tuning dial.

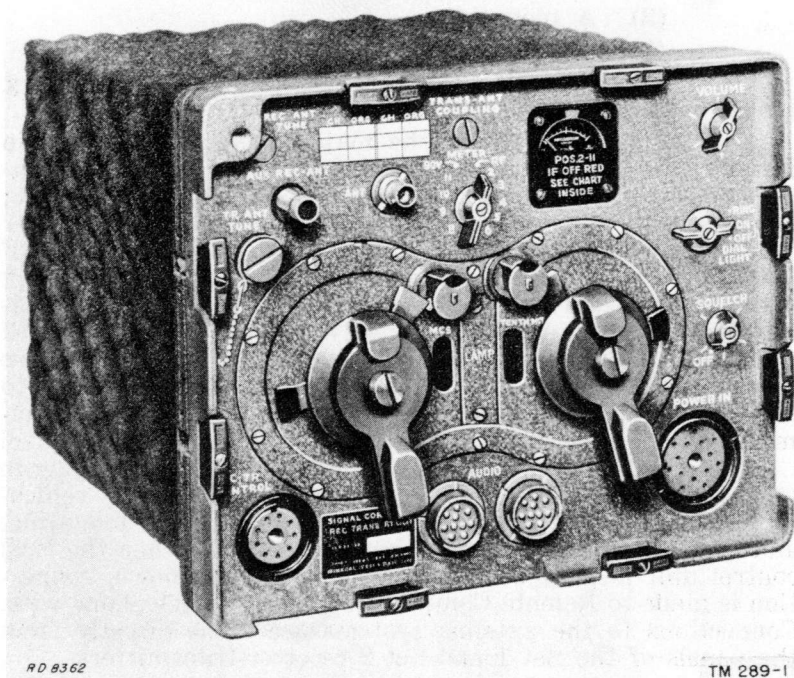


Figure 41.—Receiver-Transmitter, RT-66/GRC.

b. Each receiver-transmitter consists of a double-conversion type, superheterodyne FM receiver and FM transmitter which use a common antenna. To allow rapid selection of any two of the detented channels, a preset mechanism is provided. To allow continuous tuning between channels, provision is also made to disengage the 100-kc detent mechanism.

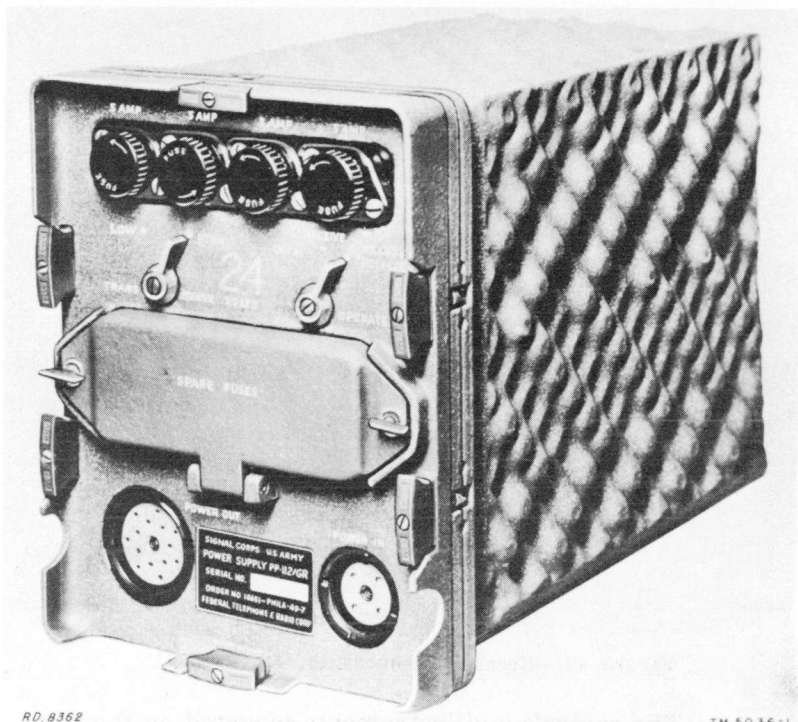
c. A panel-mounted audio receptacle is provided for the use of a chest set (with headset and microphone), a handset, headset, microphone, or loudspeaker.

d. Auxiliary operation of Set 1 is possible by removing the set from the mounting and using a battery box and/or a hand generator to furnish the necessary operating voltages.

e. **Receiver-transmitter.**—The controls for the receiver-transmitter (Receiver-Transmitter RT-66/GRC, RT-67/GRC, or RT-68/GRC) are illustrated in Figure 41. Their functions are listed in the following chart:

Control, instrument, or connector	Function
DIAL LAMP	Illuminates tuning dials except when DIAL LIGHT (OFF-ON)-RING switch is OFF.
DIAL LIGHT (OFF-ON)-RING switch	Controls dial LAMP, microphone, and ringing oscillator circuits. Spring-loaded to return to DIAL LIGHT ON position from RING position. OFF: Completes microphone circuit and turns dial LAMP off. ON: Completes microphone circuit, turns dial LAMP on. RING: Breaks microphone circuit, turns on ringing oscillator, energizes the transmitter, and turns on dial LAMP.
VOLUME control	Adjusts the audio output level to speaker and phone terminals of the panel-mounted AUDIO connectors and to control box.
SQUELCH control	Controls the noise suppression circuits of the receiver and determines what minimum level of input signal will be required for operation of the receiver. In OFF position, provides no noise suppression and allows receiver to operate at maximum sensitivity.
MCS AND TENTH MCS tuning controls and dials	Selects and indicates the operating frequency MCS: Selects and indicates each integral mc of the tuning range in 1-mc steps. TENTH MCS: Selects and indicates the decimal portion of the operating frequency in either 100-kc steps or in a continuous sequence.
Preset levers	Provide means of presetting one or two detented channels.
Meter	Indicates transmitter RF power output, filament continuity, and availability of DC (85-volts) operating potential.

Control, instrument, or connector	Function
METER selector switch	Connects meter to test points indicated below: RF position: Connects meter to transmitter RF output circuit. Positions 2 through 11: Connects meter to various filament circuits. 90v position: Connects meter to 85-volt DC supply circuit.
TR ANT TUNE control	Adjusts transmitter-antenna-circuit tuning. (This is not an operational adjustment.)
TRANS ANT COUPLING control	Adjusts coupling between transmitter output stage and the antenna. (This is not an operational adjustment.)
REC ANT TUNE control	Adjusts receiver-antenna-circuit tuning. (This is not an operational adjustment.)
AUDIO connectors	Provides means of connecting chest set (with headset-microphone), microphone, headset, handset, or speaker for monitoring or push-to-talk operation of the receiver-transmitter.
REC-TR control	Serves to make connection between the control circuits in the receiver-transmitter to external components, such as control boxes, junction boxes, etc.
POWER IN connector	Connects external plate, screen, bias, filament, and relay voltages to receiver-transmitter circuits.
ANT connector	Routes the common transmitter and receiver antenna to contacts on the antenna switch-over relay in the set.
AUX REC-ANT connector	Connects the auxiliary receiver with the antenna circuit of the receiver.



RD. 8362

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Figure 42.—Power Supply PP-112/GR, front view.

51. **Set 1 Power Supply.**—Either Power Supply PP-109/GR or PP-112/GR is used to furnish operating voltages for Set 1, depending on whether the vehicular storage battery supplies 12 or 24 volts, respectively. The two units are externally similar and differ internally only in those circuits necessary to convert the battery voltage to the proper operating voltages for the receiver-transmitters. The controls for both type power supplies are the same.

52. **Set 2 Receiver-Transmitter.**—a. Set 2 consists of a double-conversion type, superheterodyne FM receiver and FM transmitter which uses a common antenna circuit. Tuning is continuous over a range of 47 to 58.4 megacycles and a detent mechanism is provided for pre-setting any two frequencies.

b. In vehicular installations Set 2 obtains its operating voltages from either Power Supply PP-281/GRC or Power Supply PP-282/GRC through AF Amplifier AM-65/GRC. The power supply plugs into a compartment of the chassis of the interphone amplifier.

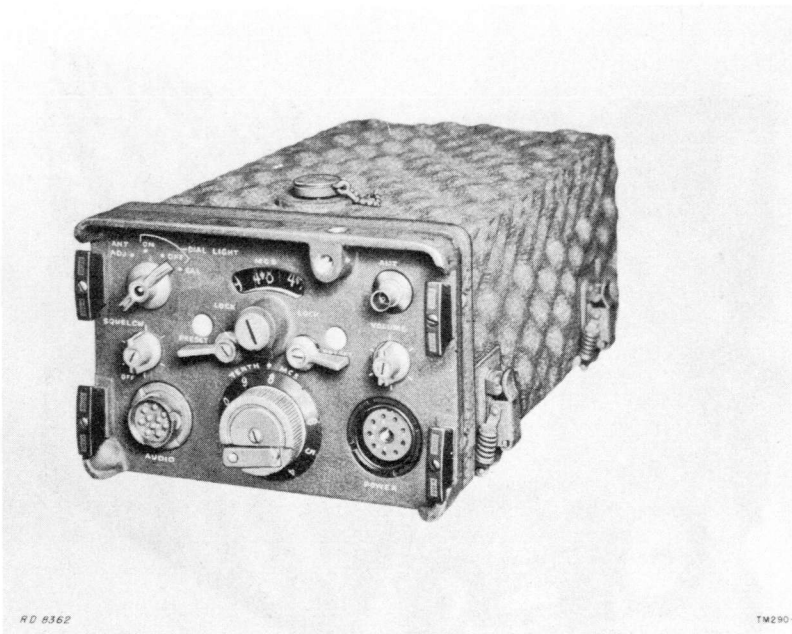


Figure 43.—Receiver-Transmitter, RT-70/GRC.

c. The controls and instruments mounted on the panel of Receiver-Transmitter RT-70/GRC are illustrated in Figure 43; their functions are listed in the following chart:

Control, instrument, or connector	Function
MCS DIAL and TENTH	MCS tuning control Selects and indicates operating frequency; MCS DIAL: Calibrations are in megacycles from 47 to 58 and indicate the integral portion of the operating frequency. TENTH MCS: Selects the operating frequency. Calibrations in tenths of a mc indicate the decimal portion of the frequency selected.
PRESET 1 and PRESET 2 levers	Provides means of presetting any two frequencies.

Control, instrument, or connector	Function
Dial LAMP	Illuminates tuning dial and tuning knob except when dial light switch is in DIAL LIGHT-OFF position.
ANT ADJ-DIAL LIGHT ON OFF- CAL switch	Controls antenna-tuning, dial light, and calibrating circuits. ANT ADJ: Turns on internal test signals for tuning antenna; turns on dial LAMP. DIAL LIGHT-ON: Turns on dial LAMP. DIAL LIGHT-OFF: Turns off dial LAMP. CAL: Turns on internal test signal for calibrating tuning dial.
ANTENNA TUN- ING control	Provides means of tuning receiver-transmitter antenna circuit. (Internal control accessible through the top of the case when protective cap is removed; not an operational control.)
ANT connector	Connects the lead from the common receiver and transmitter antenna to the antenna circuit within the set.
VOLUME control	Adjusts receiver audio-output level to the interphone amplifier and interphone box, retransmission unit, Control Group AN/GRA-6, and panel-mounted AUDIO connector.
SQUELCH control	Controls noise suppression and determines minimum level of input signal required for receiver operation. In OFF position it provides for no noise suppression and allows receiver to operate at maximum sensitivity.
AUDIO connector	Provides means for connecting a chest set (with headset-microphone), a headset, a microphone, or a speaker, for separate local monitoring or push-to-talk operation of the receiver-transmitter.

Control, instrument,
or connector

Function

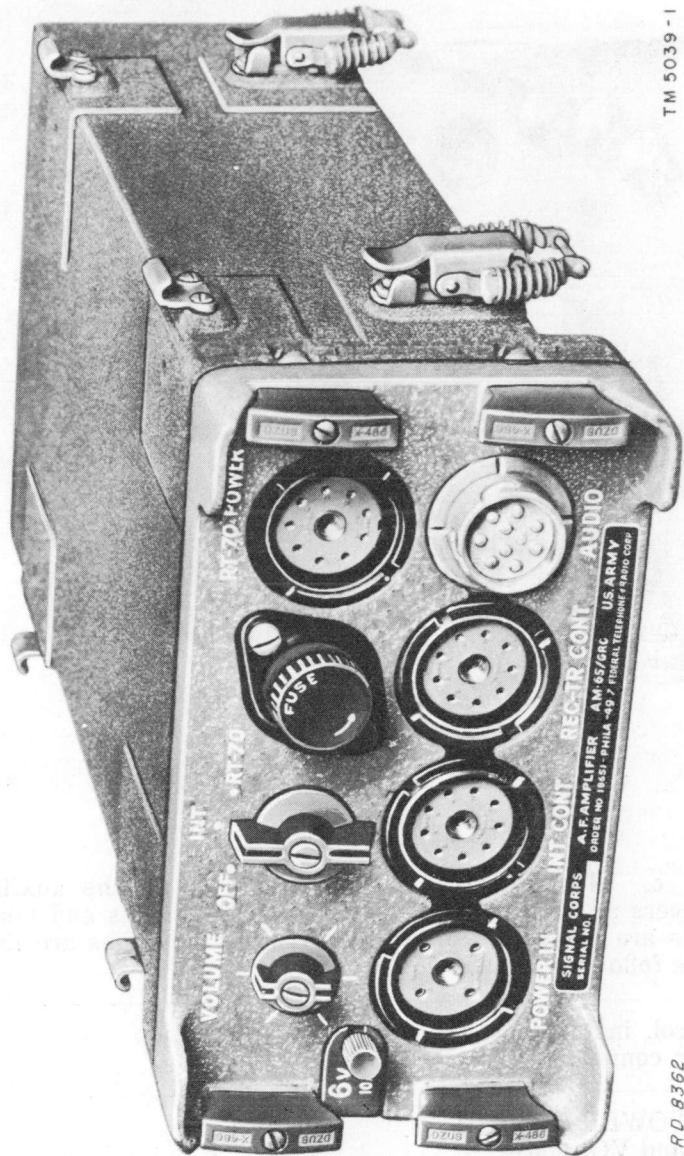
POWER connector Connects external plate, screen, filament relays, and microphone voltages to the set from power supply circuits in the interphone amplifier through Special Purpose Cable Assembly CX-1213/U. It parallels push-to-talk control connections and microphone input from the AUDIO connector. This permits push-to-talk operation from any control unit or from the interphone amplifier.

53. Interphone Amplifier.—a. AF Amplifier AM-65/GRC is a common component of all the radio sets described in this section. This unit serves a dual purpose providing not only for intercommunication between control boxes but also for monitoring the receiver-transmitters.

b. A compartment within the amplifier accommodates a plug-in power supply for 12-volt and 24-volt operation, which supplies operating voltages for both the amplifier and the Set 2 receiver-transmitter.

54. Auxiliary Receiver.—a. Radio Receivers R-108/GRC, R-109/GRC, and R-110/GRC are used as auxiliary receivers in the radio sets covered in this section. The receivers are very similar in structure, function, and detailed circuit and mechanical arrangement. They differ from each other only in their operating frequency ranges and in those components which determine the frequency range. Therefore Radio Receiver R-108/GRC, Figure 45, is similar externally to the other receivers except for the calibrations of the tuning dial.

b. Each receiver uses a single-conversion type, superheterodyne FM circuit with continuous tuning over the frequency range. A detent mechanism is provided on each receiver for presetting any three frequencies. It should be noted that the receivers duplicate the frequency coverage of the Set 1 receiver-transmitters with which they are commonly used. The operating voltage for the receiver is furnished by the power supply unit (Power Supply PP-281/GRC or Power Supply PP-282/GRC) which fits in a compartment of the receiver chassis.



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Figure 44.—AF Amplifier AM-65/GRC.

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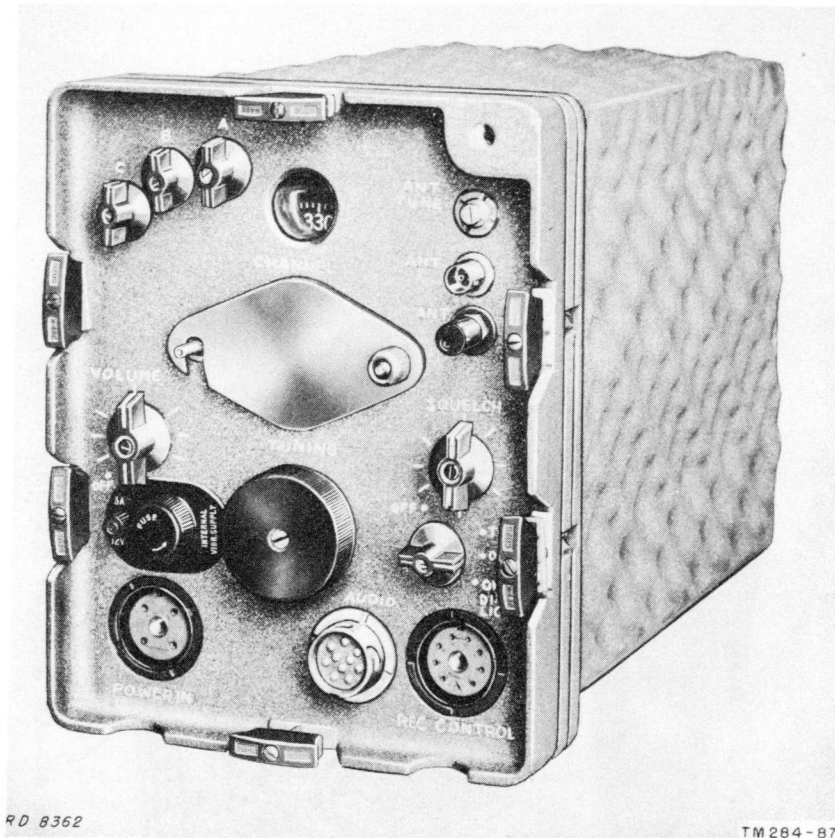


Figure 45.—Radio Receiver R-108/GRC.

c. The controls and instruments of all the auxiliary receivers are the same. The location of controls and instruments are illustrated in Figure 45; their functions are listed in the following chart:

Control, instrument, or connector	Function
POWER SWITCH and VOLUME control	Controls power to the receiver and audio output level to speaker and phones terminals. Battery circuit is broken at the input terminals of the unit when control is at OFF position.

Control, instrument, or connector	Function
Dial LAMP	Illuminates channel dial except when DIAL LIGHT ON-OFF-TUNE switch is in OFF position.
TUNING control	Selects the operating frequency.
CHANNEL dial	Indicates the operating frequency selected by the TUNING control. Major calibrations are in mc and minor calibrations are indicated at 100 kc (.1-mc) intervals.
DETENT adjust- ment screws	Provide means of presetting any three frequencies within the range of the receiver. (Located beneath diamond-shaped plate near center of the panel.)
DETENT VERNIERS (A, B, & C.)	Provides a fine adjustment on the setting of each of the three detents.
DIAL LIGHT ON-OFF- TUNE switch	Controls operation of the internal tuning oscillator and dial light. DIAL LIGHT ON: Turns on dial LAMP. DIAL LIGHT OFF: Turns off dial LAMP. TUNE: Turns on oscillator and couples oscillator output to RF amplifier; turns on dial LAMP.
SQUELCH control	Controls noise suppression and determines minimum level of input signal required for receiver operation. In OFF position provides for no noise suppression and allows receiver to operate at maximum sensitivity.
ANT TUNE control	Provides means of tuning antenna circuit.
AUDIO connector	Provides means for connecting a headset or speaker for separate local monitoring of the receiver.

Control, instrument, or connector	Function
REC CONTROL connector	Provides connection for connecting receiver to junction box on mounting.
POWER IN connector	Connects either the vehicular storage battery or the external power supply to the receiver power-supply circuits.
ANT connector (upper)	Connects the lead from the antenna to the antenna circuit within the receiver.
ANT connector (lower)	Interconnects the antenna circuit of Set 1 with the antenna circuit of the auxiliary receiver.
DIAL adjustment screw	Adjusts dial calibration by shifting the dial plate. (Located beneath the diamond-shaped plate near the center of the panel.)

55. Mounting.—a. Mounting MT-297/GR, Figure 46, serves as a support for major units of the radio sets and as a junction box for interconnecting various units. Locking levers are provided on the front edge of the mounting table to secure the units onto the table.

b. An OFF-REMOTE-ON switch is provided on the mounting which enables the operator to control the power supply for the set from one switch.

c. The junction box at the center of the unit contains the terminal boards and electrical circuits which serve to interconnect the units in an operating system. Cables are provided on either side of the junction box to connect the mounting to the vehicular battery and to the major units. Each cable is tagged to facilitate proper interconnection. A receptacle on the rear inner surface of the junction box serves to accommodate either the local control unit or the retransmission unit.

56. Interphone Box.—One or more Control Box C-375/VRC, Figure 47, is used in every installation of these radio sets. One unit is supplied with the basic radio set; additional units may be supplied in the installation kits.

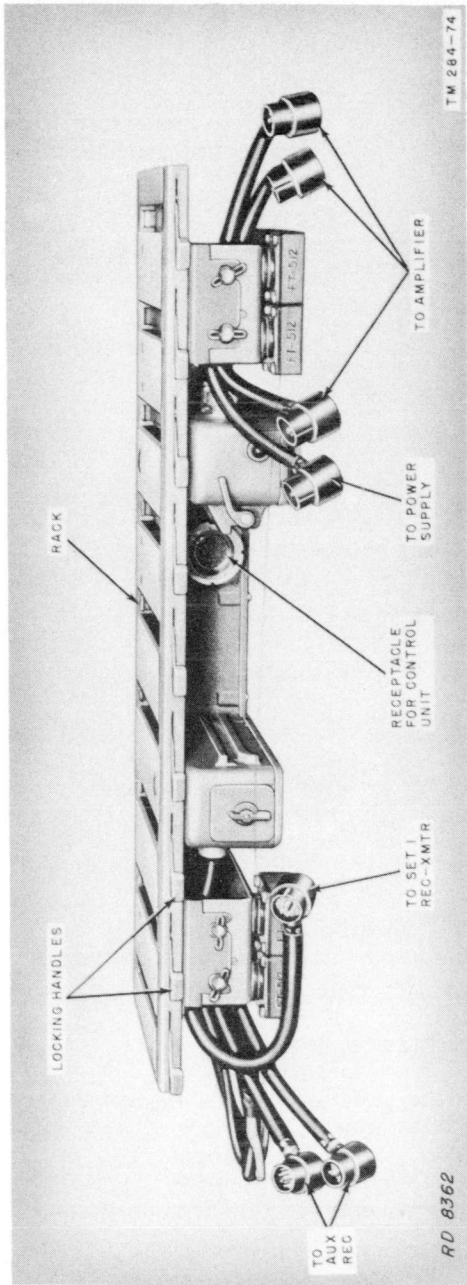
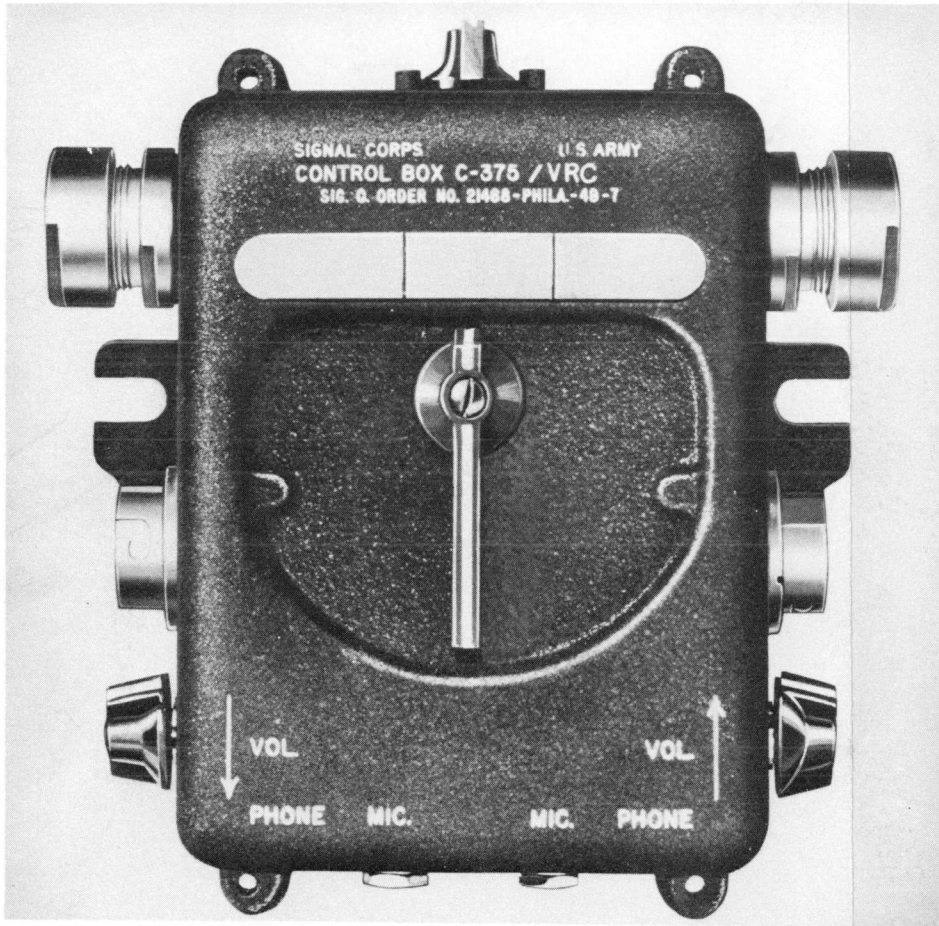


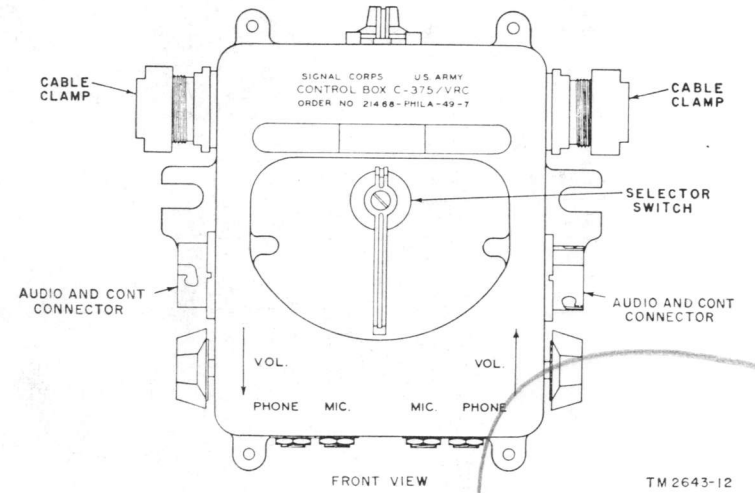
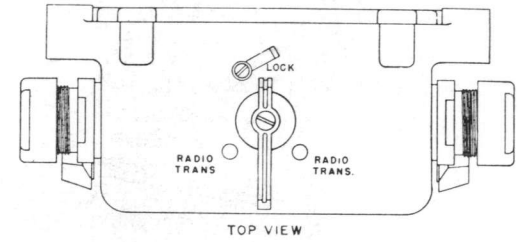
Figure 46.—Mounting MT-297/GR, front view.



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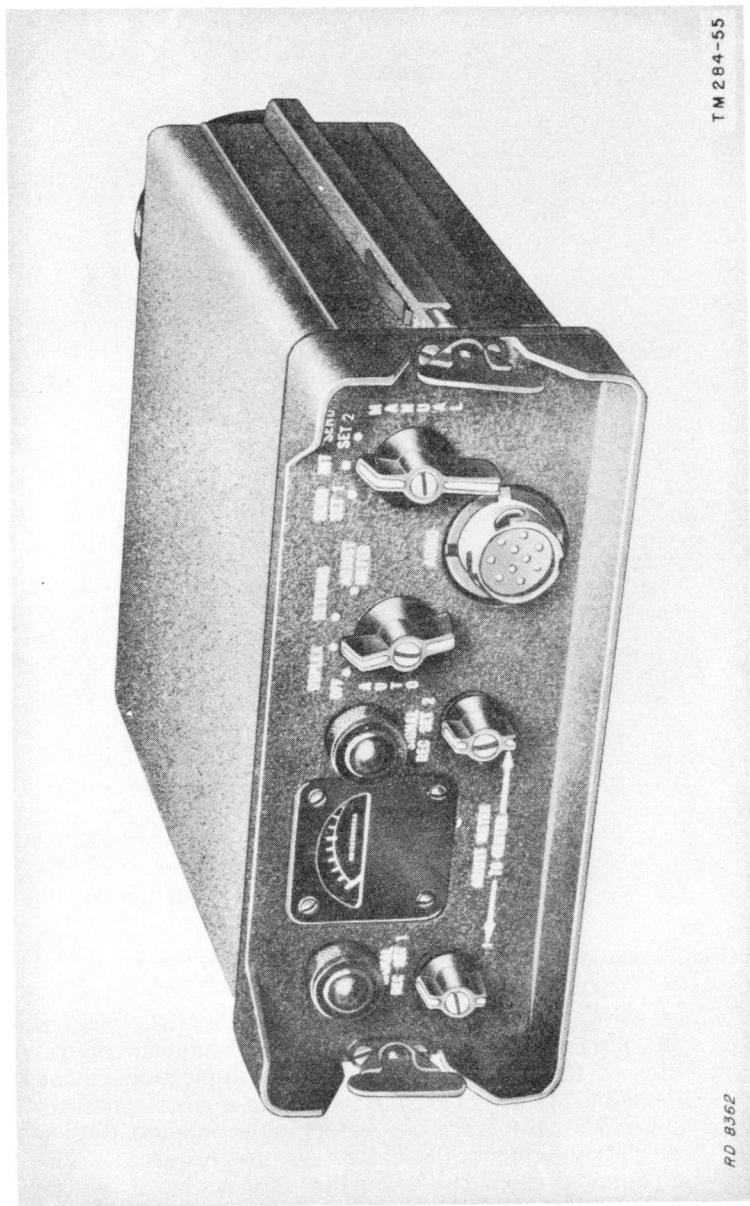
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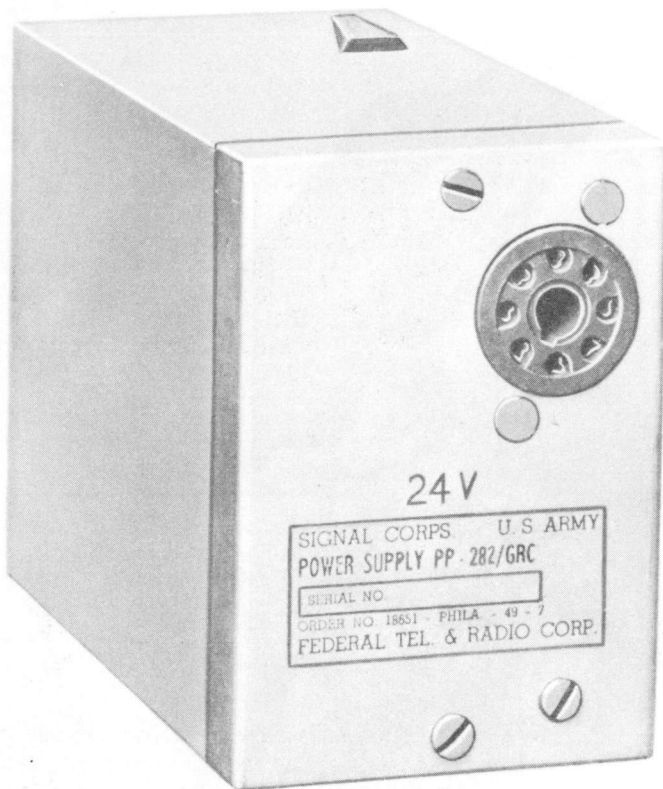
Figure 47.—Control Box C-375/VRC.



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Figure 48.—Control C-435/GRC.



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Figure 49.—Power Supply PP-282/GRC, front view.

57. **Retransmission Unit.**—a. Control C-435/GRC, Figure 48, when used, plugs into the mounting and extends the operational facilities of the radio sets to include duplex operation and retransmission. It is not essential to the normal push-to-talk operation of the sets from the interphone boxes if duplex operation and retransmission facilities are not required. The unit may be removed from the mounting and replaced by the local control unit when desired.

b. Electrically, the retransmission unit is a junction box and switching unit for the control and audio lines of the receiver-transmitters and auxiliary receiver. Both automatic and manual switching facilities are provided.

58. Remote Control Group.—Control Group AN/GRA-6, Figure 12, may be used to provide local or remote control of power for, and/or transmission from the radio sets and includes provision for telephone communication between local and remote control stations. A description of the functions of the panel mounted controls of both the local and remote control unit is given in Paragraph 14d.

59. Set 2 and Auxiliary Receiver Power Supply.—The operating voltages for Set 2, the auxiliary receiver, and the interphone amplifier are furnished by either Power Supply PP-281/GRC or PP-282/GRC, depending upon whether 12 or 24-volt power is available. Both units are similar in appearance and general characteristics. The units are vibrator type power supplies which can be plugged into the compartments on the auxiliary receiver and the amplifier chassis.

60. Audio Accessories.—Audio accessories for operating the radio sets are supplied in the installation units and vary in type and number according to the type of vehicular installation. The accessories include a chest set, various handsets, microphones, and a loudspeaker. The audio accessories furnished with the equipment are the only types which can be connected to the 10-pin audio connectors on the radio sets. The interphone box is the only unit equipped with jacks which will accommodate any substitute accessories. The use of substitute accessories will decrease the operating efficiency of the equipment.

61. Installation.—a. Instructions for installing these radio sets may be found in TM 11-284. For specific details pertinent to particular vehicles, reference should be made to the installation instructions supplied with the installation unit for the vehicle.

b. Although the radio sets are issued completely aligned, the antenna circuits for Set 1, Set 2, and the auxiliary receiver, must be tuned when the antenna is connected to a particular system.

c. Figure 50 shows a typical vehicular installation of these radio sets.

62. Methods of Operation.—a. **Monitoring.**—Each of the receivers in the radio sets can be operated strictly as a monitor if so desired. Generally, all receivers will be monitored simultaneously at the interphone box, the retransmission unit, or the local control unit. It is also possible to monitor each receiver separately by means of a speaker or headset connected directly to the unit audio connector.

b. **Push-to-talk operation.**—Push-to-talk operation of either Set 1 or Set 2 may be selected at the interphone box, the retransmission unit, the local control unit, and the remote

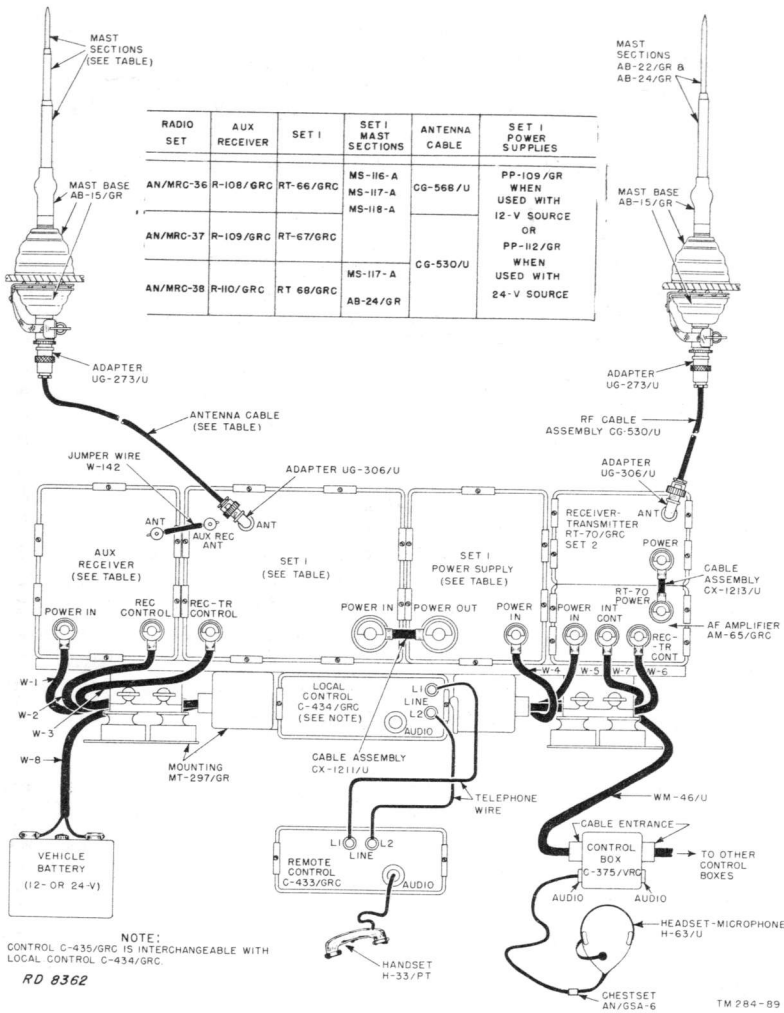


Figure 50.—System cordage diagram, AN/MRC-36, -37, and -38.

control unit. The interphone box is most commonly used. It is also possible to operate each receiver-transmitter individually by means of a chest set or hand set connected directly to the unit audio connector.

c. **Interphone facilities.**—Interphone facilities are available to the operators at each interphone box, the retransmission unit, and the panel of the interphone amplifier. Normally, the panel of the interphone amplifier will not be used as an interphone station, but it is a convenient point for checking the operation of the amplifier itself.

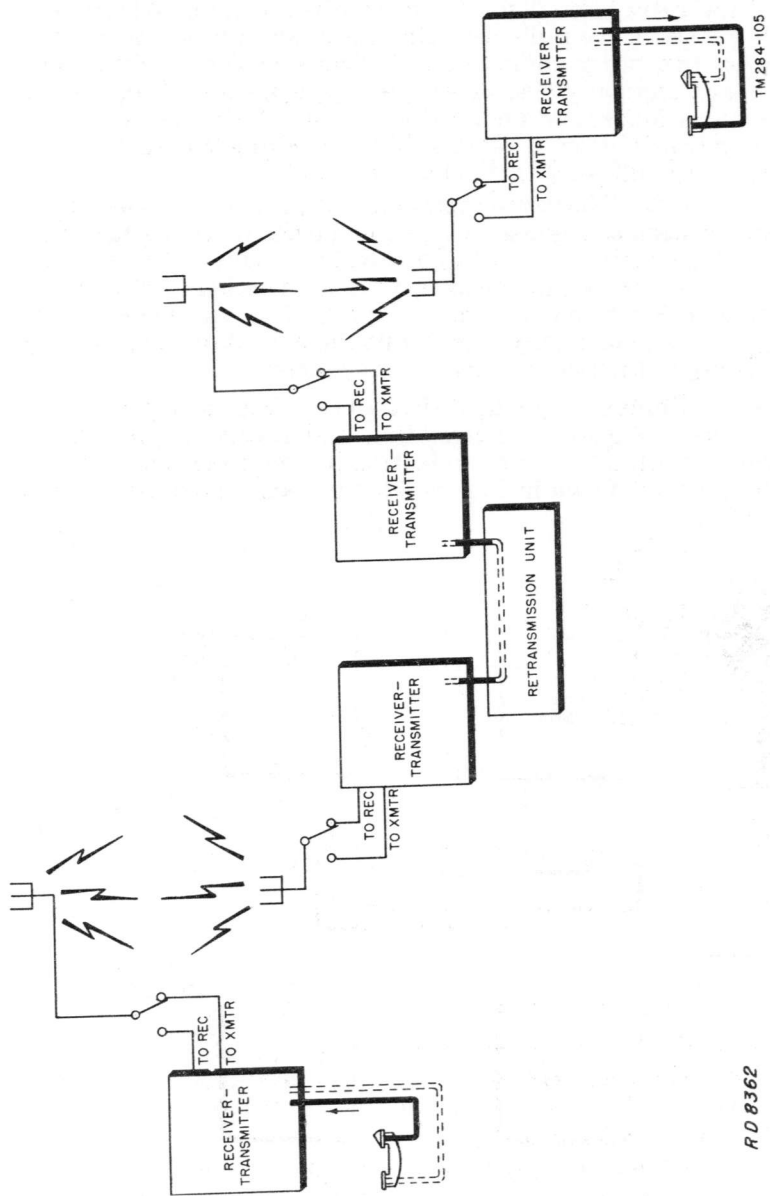


Figure 51.—Retransmission system, block diagram.

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d. **Retransmission facilities.**—(1) Facilities are provided for retransmission of any received signal. When this facility is used, the radio set acts as a relay or repeater station between two other radio sets. Retransmission facilities are important tactically since they provide a means of extending communication range and, through use of the Set 2 liaison receiver-transmitter, a means of establishing communication between two different tactical units.

(2) The retransmission unit provides for automatic retransmission of signals received by either receiver-transmitter (Set 1 or Set 2). The signal which arrives first controls the direction of retransmission, that is, whether the signal is received on Set 1 and transmitted on Set 2 or vice versa. It is also possible to manually retransmit the output of the auxiliary receiver over the Set 2 receiver-transmitter.

e. **Duplex radio facilities.**—(1) Duplex radio operation utilizes separate transmitting and receiving circuits to provide simultaneous communication in two directions. In the block diagram shown in Figure 52, one receiver-transmitter is

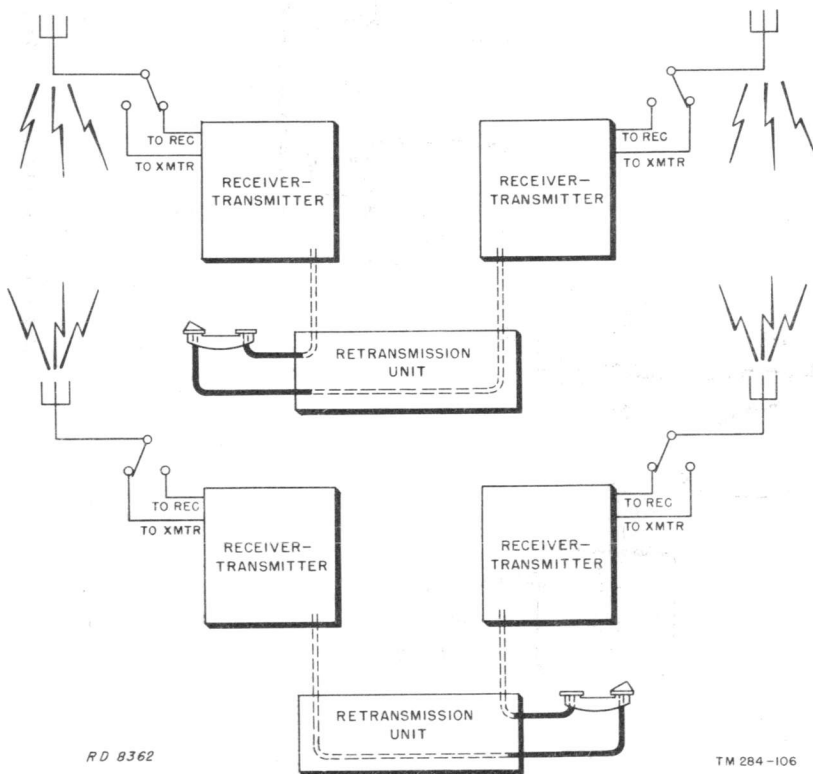


Figure 52.—Duplex operation, block diagram.

utilized for receiving while the other receiver-transmitter is used for transmitting. Both stations involved in the duplex network must have these separate facilities in order to make this simultaneous two-way or **break-in** operation possible.

(2) The retransmission unit of the radio sets provides the switching circuits required for duplex operation. The duplex operation utilizes Set 1 for transmitting and Set 2 for receiving. It is also possible to utilize the auxiliary receiver and Set 1 in a duplex set-up.

f. **Remote control facilities.**—The use of the remote control and local control units makes it possible to control application of power for the radio set and/or push-to-talk operation of either Set 1 or Set 2 from a control station 2 miles from the major installation. When both the local and remote control units are used, duplex telephone facilities are available for communication between local and remote control units.

63. **Interference Charts.**—a. The tuning of Sets 1 and 2 involves not only the simple mechanics of control settings but also a problem of frequency selection. Frequency selections must be made to avoid interference between the two receiver-transmitters. Interference charts have been prepared to indicate those frequencies at which interference-free operation can be expected with Set 1 transmitting and Set 2 receiving, or vice versa.

b. Frequency selections on Sets 1 and 2 should be made with the aid of the interference charts included in the technical manuals issued with each radio set. The method of operation desired; for example, push-to-talk operation of Set 2 or duplex operation on Sets 1 and 2 should first be determined, and then the appropriate chart or charts should be consulted to determine what interference-free frequencies are available for the particular tactical application involved. For retransmission each set may be used alternately as a receiver and as a transmitter. It is necessary, therefore, that the possibility of interference be checked for both conditions of operation.

c. The auxiliary receivers offer additional interference problems. Trial-and-error methods will have to be used to determine what transmitting frequencies are possible without interference. If the auxiliary receiver is not needed, it can be turned off so that the Set 1, Set 2 interference problems will be the only ones to combat.

64. **Modification Kit MX-898/GR.**—a. **Purpose and use.**—The modification kit is used to provide temporary field operation of either Set 1 or Set 2, when either unit is removed from a vehicle, in a temporary fixed location, or when vehicular power is not available. If the modification kit is used in conjunction with Control Group AN/GRA-6 to operate either Set 1 or Set 2, remote and local operation of either set is possible in a field installation.



Figure 53.—Generator G-8/GRC.

b. **Components.**—(1) Generator G-8/GRC.—The generator is a hand-operated power source and can supply all the voltages required for the operation of the radio receiver and/or transmitter. The output voltage of the generator is not as high as that delivered when using a vehicular power supply because the generator would be too difficult to crank. However, the output from the transmitter, when the hand generator is used, is only slightly less than that of other power sources and will not greatly affect the operating range of the set. The generator is intended to be used for portable ground stations and not for mobile operation. A single operator seated on the seat leg operates the generator by turning the

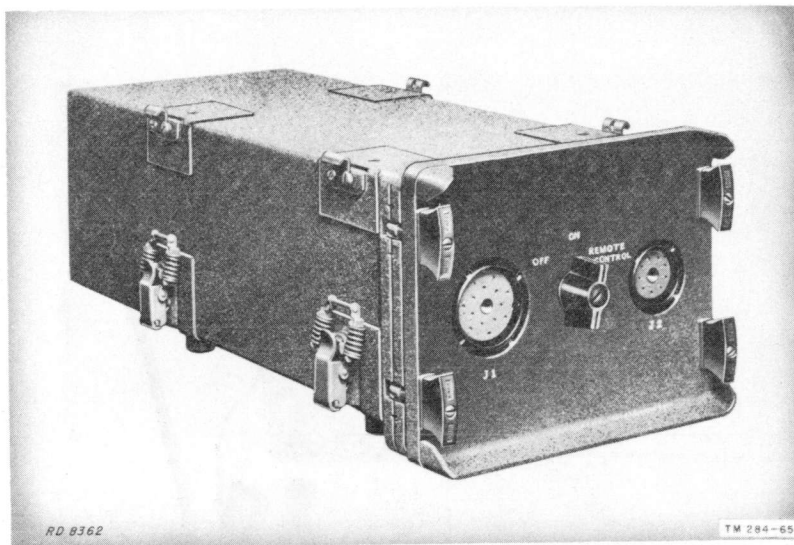


Figure 54.—Case CY-590/GR, front view.

cranks at the required speed. When cranked between 50 to 70 rpm, the generator is capable of delivering an output of approximately 85-watts at the voltages required for normal receiver and transmitter operation.

(2) Case CY-590/GR.—This case is a battery box which holds five series connected 1.5-volt Batteries BA-403/U and one 90-volt Battery BA-419/U. The battery box, when used, is connected to the receiver transmitter. It supplies sufficient power to operate the receiver section without additional power. When the hand generator is connected to it, the generator supplies the additional power needed for transmission. The receptacles on the front panel of the battery case are used for interconnecting the battery case with the receiver-transmitter and the hand generator. The switch on the panel is for the purpose of completing or breaking the battery circuits to the receiver-transmitter.

(3) Mast sections.—These sections, in various combinations depending upon the radio set being used, provide the antenna for field operation. A mounting for the antenna is provided and fits on the front panel of the receiver-transmitter. A lead-in wire is provided to connect the antenna to the receiver-transmitter.

(4) Handset H-33/PT.—This handset is included in the modification kit to be used as the audio device for the receiver-transmitter.

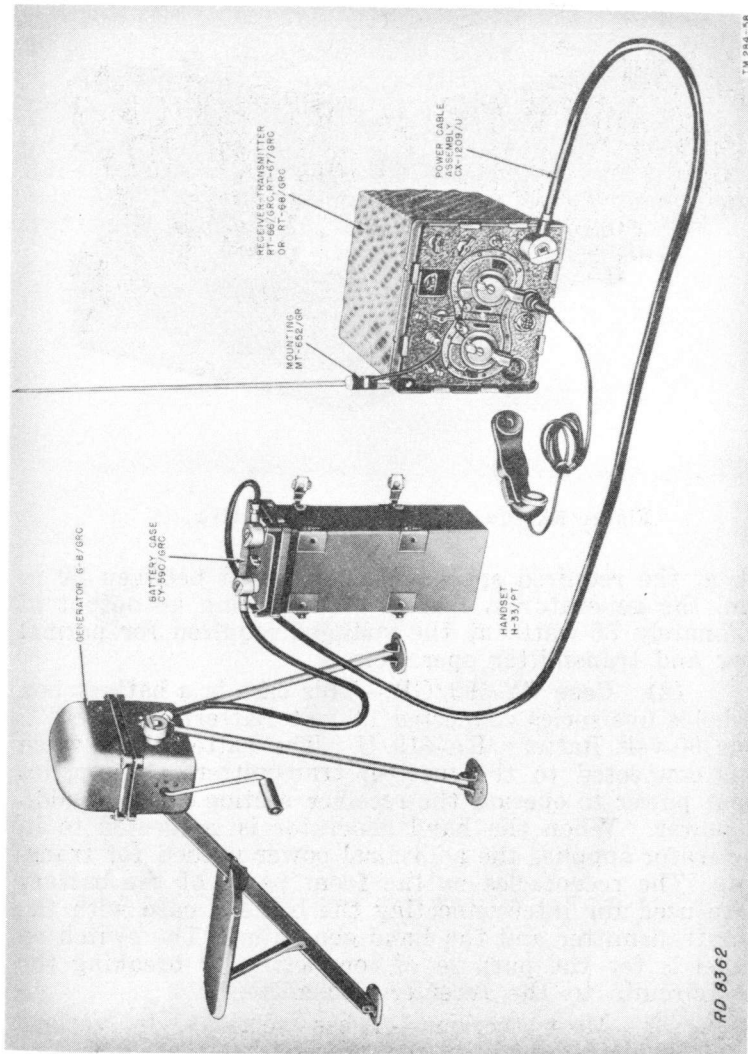


Figure 55.—Field operation of Set 1 with Generator G-8/GRC and Case CY-590/GR.

(5) Carrying bags.—Sufficient canvas carrying bags are provided for transporting the receiver-transmitter, generator, battery box, and other equipment furnished with the modification kit.

(6) Power cables.—Two power cables are provided for connecting the receiver-transmitter to the battery case and the generator to the battery case or directly to the receiver-transmitter.

c. **Elevated Antenna RC-292** may also be used as auxiliary equipment with the radio sets described in this section to extend the communication range to 25 miles. A description of this equipment may be found in Paragraph 14f.