SECTION 5

RADIO SET AN/MRC-6

38. **General.**—a. Radio Set AN/MRC-6 is a vehicular radio set. It is composed of a model TCS radio transmitter and receiver mounted in a ¼-ton cargo truck, 4 x 4. Using a whip antenna mounted on the side of the vehicle, the radio equipment may be operated while the vehicle is in motion as well as from a stationary position.

b. The radio set consists of a transmitter, receiver, power unit for supplying power to the set, a remote control unit mounted with a speaker, whip antenna, and an antenna tuning unit. All components of the set are securely mounted and adequately reinforced to withstand the vibration and shock incident to normal service. For protection of the operator, the transmitter is equipped with an interlock switch which opens and removes all power from the unit whenever the transmitter is removed from its cabinet.

c. The transmitter and receiver are amplitude-modulated and are capable of receiving and transmitting both radiotelephone and radiotelegraph signals.

39. **Technical Characteristics.**—a. The frequency range of the transmitter and receiver, 1,500 kc to 12,000 kc, is covered in three bands as selected by a three-position switch on the front panel of each unit:

Band 1	1,500 kc to 3,000 kc.
Band 2	3,000 kc to 6,000 kc.
Band 3	6,000 kc to 12,000 kc.

b. The transmitter may be either master-oscillator controlled or crystal controlled. The four crystals, all of which are ground within the range of 1,500 kc to 3,000 kc, may be operated on their four fundamental frequencies in band 1 and four harmonics in bands 2 and 3, respectively, thus providing 12 possible crystal controlled frequency choices. The master-oscillator is capable of tuning over the entire frequency range.

c. A 20-foot whip antenna is provided for transmission and reception. Under normal conditions of operation, the equipment has a reliable communication range of 15 miles using voice and 30 miles using CW.

d. One single type dynamotor unit provides operating voltages for both the transmitter and receiver. The dynamotor unit receives its power from a 24-volt direct current power supply built in the vehicle. This power supply consists of a 24-volt battery which is charged by the vehicle's regular generator.

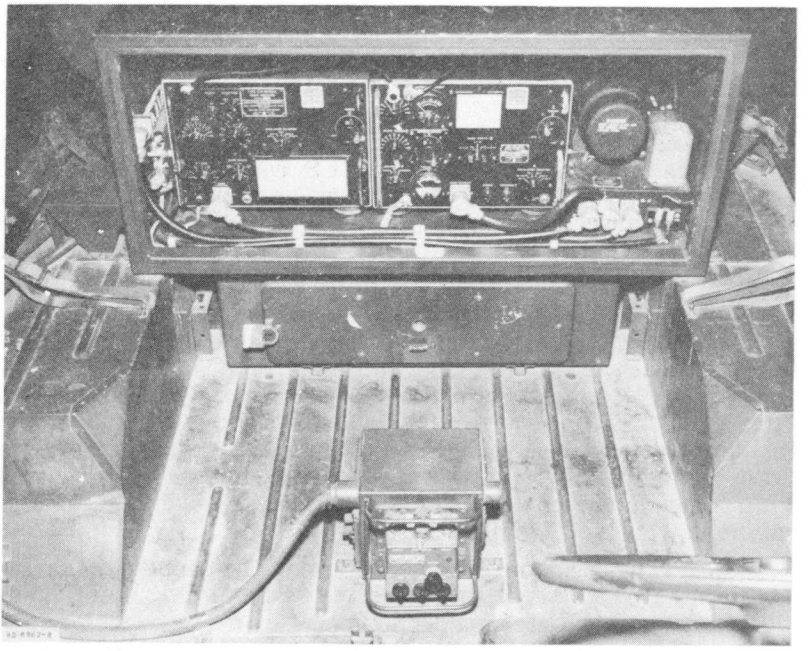

Figure 33.—Radio Set AN/MRC-6.

e. The basic components of the radio sets, mounted in the vehicle, are as follows:

Receiver-transmitter (TCS radio).
Dynamotor power unit.
Antenna loading coil.
Remote control unit.
Audio accessories.

40. Transmitter Section.—The controls of the transmitter are shown in Figure 34; their functions are shown in the following chart:

Control or Meter	Function
RECEIVER	Post for connecting receiver unit to transmitter when single antenna is being used.
ANTENNA	Post for connecting antenna lead-in.
ANTENNA CURRENT	Shows the current, in amperes, being applied to the antenna.

Control or Meter	Function
TUNING DIAL WINDOW AND TUNING KNOB	Shows what frequency the transmitter is set on. In TUNING DIAL WINDOW, Band 1 frequencies are shown on the bottom line, Band 2 frequencies are shown in the center, and Band 3 at the top. The TUNING knob is provided with a locking key.
COUPLING	A tank-inductor, used in conjunction with the PLATE TUNING control to regulate the degrees of coupling between the final amplifier circuit and the antenna.
PLATE TUNING	A tuning capacitor used in conjunction with the coupling switch.
ANTENNA LOADING	A variable inductor used to match the output circuit of the transmitter to the antenna.

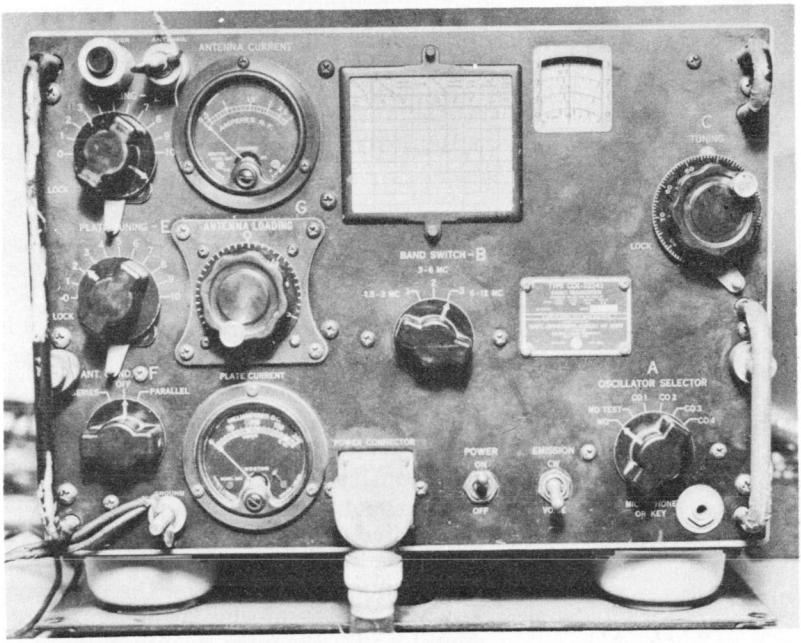

Figure 34.—Transmitter Unit, front panel, AN/MRC-6.

Control or Meter	Function
ANT. COND.	In conjunction with the COUPLING, THE PLATE TUNING and ANTENNA LOADING controls, provide a means for matching the antenna lengths to the output circuit of the transmitter. SERIES: Places an antenna-padding capacitor in series with the ANTENNA LOADING and the antenna. OFF: Removes the antenna-padding capacitor from the circuit and connects the ANTENNA LOADING directly to the antenna. PARALLEL: Places the antenna-padding capacitor in parallel with the antenna and ground, leaving the ANTENNA LOADING connected directly to the antenna.
BAND switch	A three-position switch used to select the proper frequency band.
PLATE CURRENT	Shows the amount of current being applied to the plate circuit. When the microphone push-button or the key is closed, the plate current can be read. The rated plate current readings are: VOICE—80 to 90 ma. CW—170 to 180 ma.
POWER connector	Connector for power supply cable.
POWER switch	Controls power input to the transmitter.
EMISSION switch	Used to select the type emission desired, VOICE or CW.
OSCILLATOR selector	Provides a means for selecting the type of frequency control desired. Four positions, CO 1, CO 2, CO 3, and CO 4 provide facilities for crystal-controlled operation. The crystal frequencies and their tuning dial settings should be shown on the chart at the top center of the transmitter. MO TEST: Permits preliminary frequency adjustments to be made using the master oscillator.

Control or Meter	Function
	MO: Closes the master oscillator circuit for actual operation of the transmitter.
MICROPHONE OR KEY	Jack for connecting either a microphone or key, depending upon the type of signal to be transmitted.

41. Receiver Section.—The controls for the receiver section of the radio set are shown in Figure 35; their functions are described in the following chart:

Control or Meter	Function
ANTENNA	Post for connecting separate antenna. When single antenna is being used for both the receiver and transmitter, this post is connected to the RECEIVER post on the transmitter.
MOD.-MOD(N.L.)-CW(N.L.)-CW	Switch for selecting the type of signal to be received, either VOICE (MOD) or CW. In noise limiter (N. L.) positions, noise is reduced by clipping high peaks off modulation.
POWER switch	Controls power input to the receiver. Receiver may be operated alone by turning the switch to the ON position and leaving the transmitter POWER switch at the OFF position.
TUNING DIAL WINDOW AND TUNING control	Shows the operating frequency of the receiver. Band scales in TUNING DIAL WINDOW are graduated the same as for the transmitter.
CW PITCH	Used to vary the pitch of the audio-beat-frequency note for CW operation.
AF GAIN	In conjunction with the RF GAIN used to select the desired sensitivity and audio output.

Control or Meter	Function
RF GAIN	Used in connection with the AF GAIN to select the desired sensitivity and audio output.
OSCILLATOR selector	Used to select any one of four crystals or the master oscillator for frequency control.
BAND switch	A three-position switch used to select the desired frequency band.
GROUND	Post for connecting the lead-in from the ground.
POWER connector	Connector for power input to the receiver.
PHONES	Jack for connection of operator's earphones.

42. Dynamotor Power Unit.—a. The power supply consists of a single type dynamotor unit operating from a 24-volt direct current source of power. It furnishes 400 volts direct current for the high voltage stages of the transmitter, 225 volts for the low-power stages of the transmitter and for the operation of the receiver, and 12 volts for the filaments.

b. A fuse in the 24-volt input circuit is located in a recess on the right outside of the vehicle forward of the passenger's seat. Fuses are also located in the dynamotor unit. Spare fuses are carried in the fuse cover.

c. Connectors are provided on the side of the dyamotor unit for connecting the power cables to the transmitter, receiver, and the remote control unit. Binding posts are provided for connecting the power cable from the 24-volt power source.

d. The power supply unit is shown in Figure 36.

43. Antenna Loading Coil.—a. The antenna loading coil is essential to the satisfactory performance of the transmitter when the latter is used with the twenty-foot vertical whip antenna in the frequency range of 1500 kc to 3000 kc. The inductance of this coil is variable in steps marked from "O" to "6". Step "O" is maximum inductance for the lower frequency in this range and step "6", minimum inductance, is for the high frequencies.

b. Three binding posts are provided on the control panel of the coil. The two wing nut connectors are for connecting the lead-in from the antenna and for connecting the

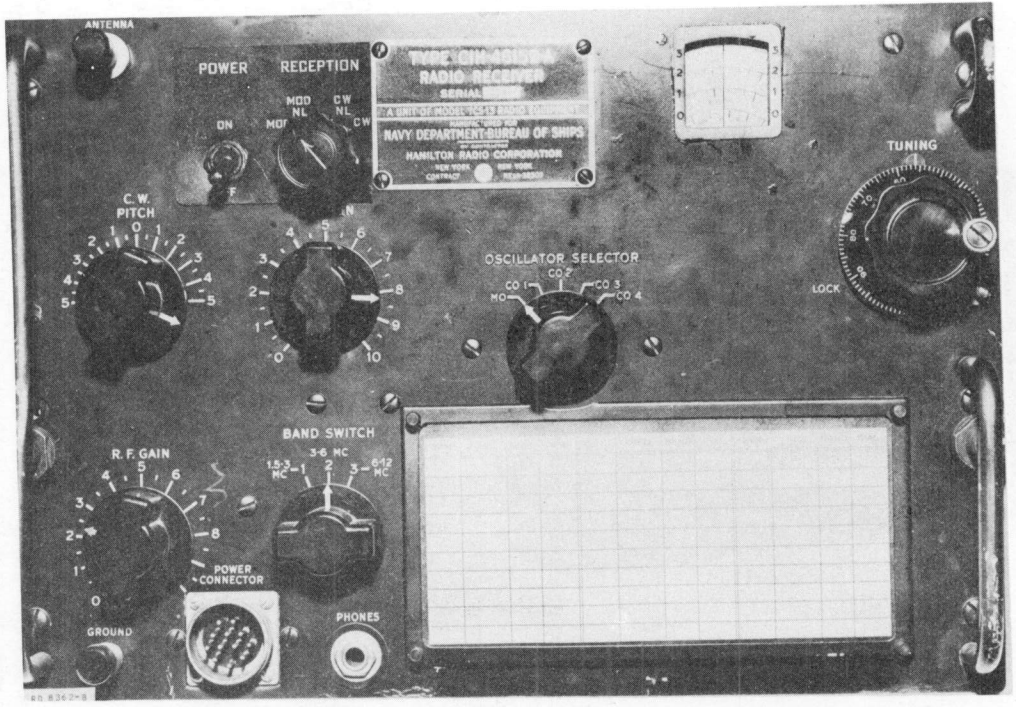

Figure 35.—Receiver Unit, front panel, AN/MRC-6.

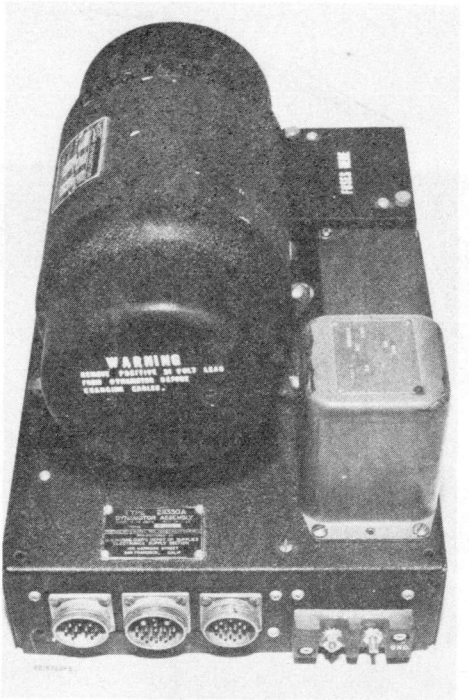

Figure 36.—Dynamotor Power Unit, AN/MRC-6.

coil to the transmitter unit. The loading coil should be connected in series to the antenna and the transmitter. The third connector is for connecting the coil to the ground on the transmitter.

c. In making loading adjustments whenever the antenna loading coil and the transmitter internal loading coil are used in conjunction, the most effective combination of the two is with the lowest-numbered possible setting, maximum inductance, on the antenna loading coil and the highest-numbered possible setting, minimum inductance, of the ANTENNA LOADING control on the transmitter front panel.

44. Remote Control Unit.—a. The remote control unit contains all the components necessary for power-supply control and emission control of the transmitter and for power-supply control and audio-output control of the receiver. In addition to the controls it contains a five-inch permanent magnet loudspeaker. It is mounted on the rear floor directly behind the emergency brake handle.

b. A remote control unit, such as Remote Control Unit RC-261, may be used to control the operation of the radio set from a remote position up to two miles away.

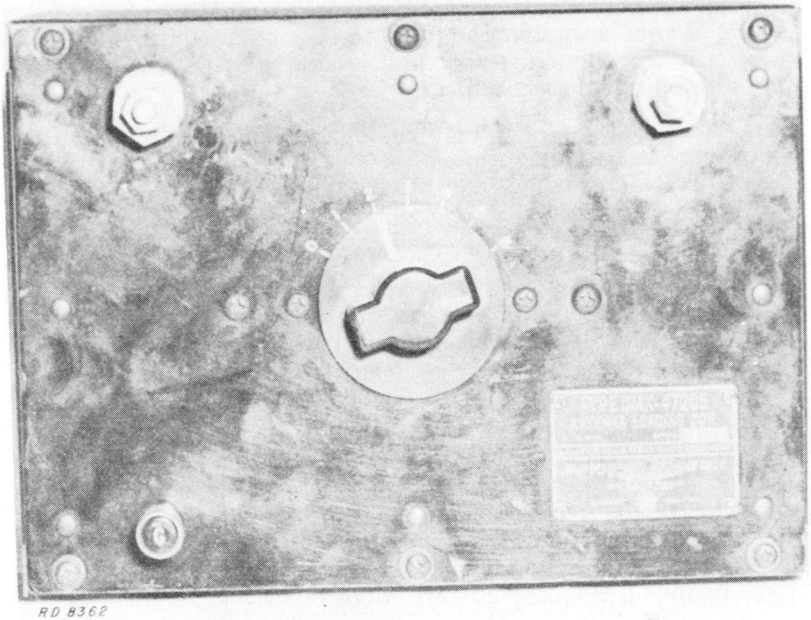

Figure 37.—Antenna Loading Coil, AN/MRC-6.

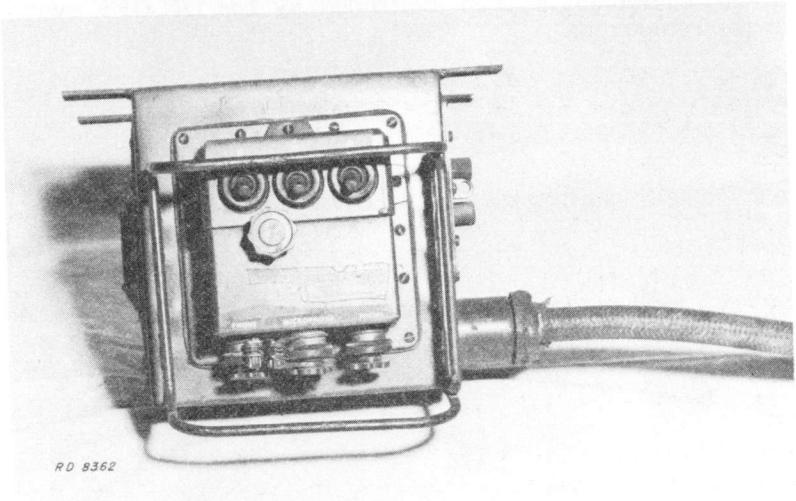

Figure 38.—Remote Control Unit, AN/MRC-6.

45. Audio Accessories.—Two headsets and two microphones are included in the audio accessories, in addition to the telegraph key. Suitable headset cords are included to fit the PHONES jacks on the receiver unit and the remote control

unit. The microphone assemblies consist of Microphone T-45 and cord, with a switch for push-to-talk operation. The telegraph key is a standard key and is equipped with a leg band for more efficient operation.

46. Operation.—a. Personnel assigned as radio operators for this type equipment should be thoroughly familiar with the operating instructions issued with each radio set.

b. Prior to operation of the equipment the operator should check the antenna and ground connections. A good ground is an important part of the radiation system.

c. For operation of both the transmitter and the receiver, the power switch on each unit must be in the ON position. The receiver unit may be operated alone if it is desired. However, the transmitter will not operate unless the receiver power switch is in the ON position.

d. Care must be exercised to prevent damage to the final amplifier tubes due to over-heating in out-of-resonance operation while tuning up. Under no circumstances should the plate current reading be allowed to exceed—for any length of time—the rated values, indicated by the red "VOICE" and "CW" bands of the plate current meter.

e. Once the desired frequency has been set on the equipment and all adjustments for operation made, the radio set may be operated from the remote position. Power supply to the equipment is then controlled by the ON-OFF switch at the remote unit.