

SECTION 7

RADIO SET AN/MRC-32

65. **Purpose and Use.**—a. Radio Set AN/MRC-32 consists of a transportable assembly of equipment, Figure 56, providing facilities for transmission and reception of radioteletype signals on a frequency-shift basis over a frequency range of 2 to 18 megacycles. Maximum power output is approximately 400 watts. Facilities are provided for operation of full-duplex or one-way circuits (Par. 69). CW telegraphy is available, and amplitude-modulated voice transmission may be used alone or simultaneously with teletypewriter operation. Shelter S-69/GRC, containing the communication equipment, is normally transported by a 2½-ton, 6x6 cargo truck. Generator Set PU-290 consisting of Power Unit PE-95 installed in a 1-ton trailer, is towed by the cargo truck. The complete radio set is sufficiently compact to be transported in a type C-82 aircraft. Telegraphy and radioteletype facilities can be used in motion or at a halt. For teletype communication, it is recommended that the vehicle be brought to a halt. Under favorable conditions (on smooth terrain), mobile teletype operation is feasible on a one-way basis.



Figure 56.—Radio Set AN/MRC-32.



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1. Cabinet CY-1050/GRC-26A
2. Radio Receivers R-388/URR
3. Loudspeakers LS-3
4. Clock
5. Power Supply PP-712/GRC-26A
6. Heater
7. Frequency Shift Converter CV-182/GRC-26A

Figure 57.—Radio Set AN/MRC-32, receiving components.

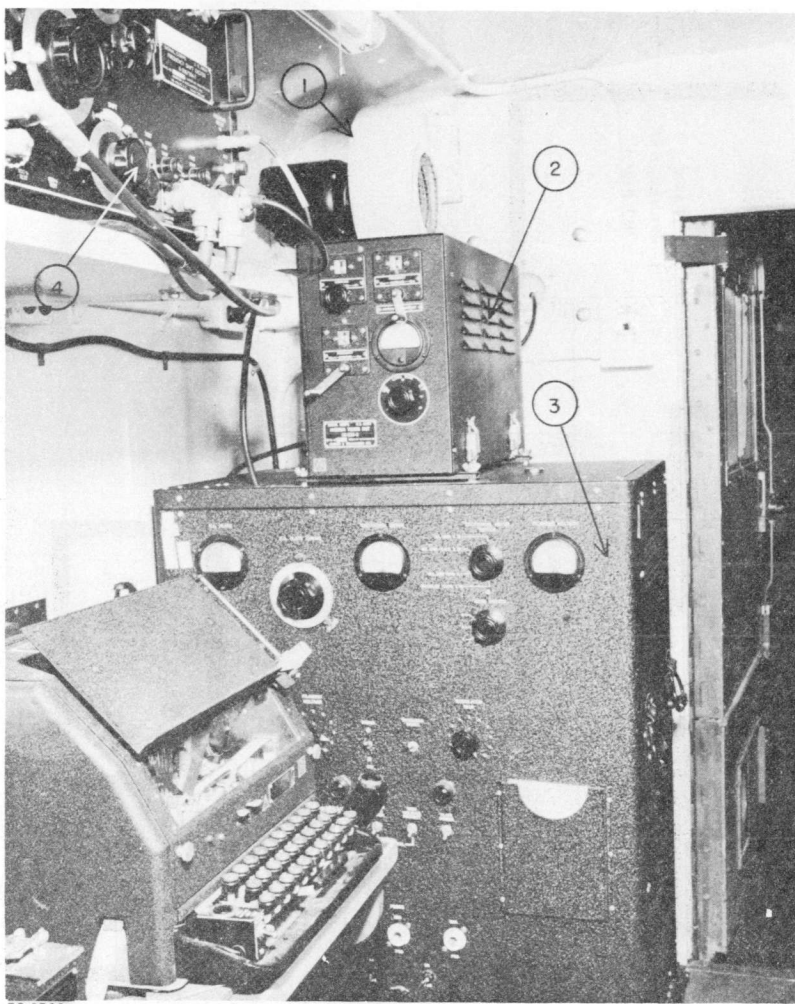


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- | | |
|---|---|
| 1. Spare teletypewriter typing unit | 5. Time stamp |
| 2. Speech Amplifier BC-614-H | 6. Perforator-Transmitter TT-55/MGC (Transmitter-Distributor) |
| 3. Radio Teletypewriter Control C-808/GRC-26A | 7. (Perforator) |
| 4. Frequency Shift Exciter 0-39 B/TRA-7 | 8. Teletypewriters TT-55/MGC |
| | 9. Rectifier RA-87 |
| | 10. Radio Transmitter BC-610-H |

Figure 58.—Radio Set AN/MRC-32, teletype operating components.



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1. Blower
2. Antenna Tuning Unit BC-939-B
3. Radio Transmitter BC-610-H
4. Frequency Shift Exciter 0-39B/
TRA-7

Figure 59.—Radio Set AN/MRC-32, transmitting components.

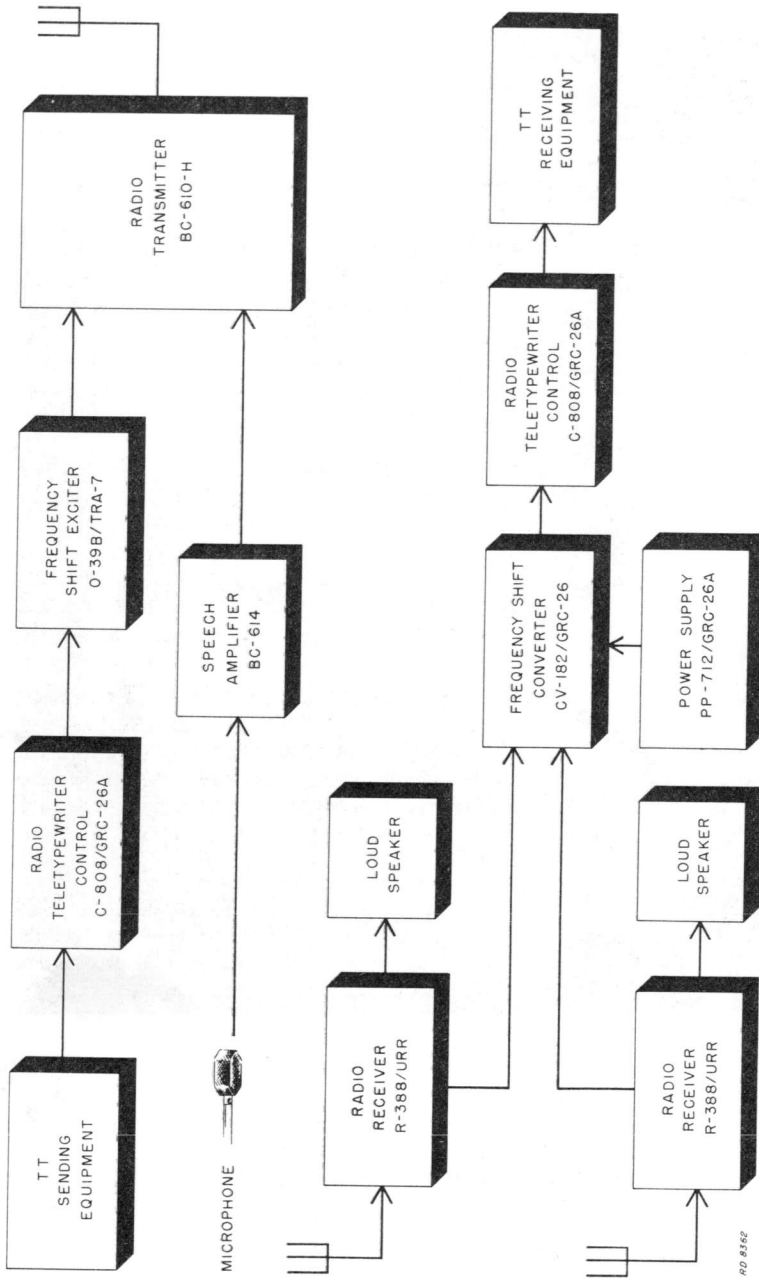


Figure 60.—Radio Set AN/MRC-32, simplified block diagram.

b. For mobile, one-way operation, three whip antennas are used: two for receiving and one for transmitting. Mobile-at-halt operation normally utilizes whip antennas. If time permits, however, a doublet transmitting antenna should be erected to improve transmitted signal strength. For semifixed installations, doublet antennas are used for transmitting and receiving, the latter with two antennas for dual space diversity reception, if desired. One-way or full-duplex service may be used for both mobile-at-halt and semifixed operation.

c. Radio Set AN/MRC-32 includes standard Signal Corps radio and teletype transmitting and receiving equipment. All operating components are housed in rack cabinets or mounted on tables and shelves in Shelter S-69/GRC. Storage cabinets for accessories and supplies also are provided. Figures 57, 58, and 59 show the equipment inside the shelter.

66. Simplified System Explanation.—a. Figure 60 shows a simplified block diagram of the major components of Radio Set AN/MRC-32. The transmitter may be used for voice and radioteletype transmissions simultaneously (Figure 60). The teletype equipment, radio teletypewriter control, frequency shift exciter, speech amplifier, and radio transmitter, are used in this type of operation. The signal is radiated by a single antenna.

b. During reception, two antennas are used. The voice portion of the received signals is amplified and is detected by two radio receivers and fed to the loudspeakers or headsets. The radioteletype signal is removed from the receivers at the intermediate frequency and passed through the frequency shift converter and radio teletypewriter control to the teletype equipment. (Figure 60).

67. Technical Characteristics.—a. **Radio Transmitter BC-610-H** (Figure 59) is a medium-power transmitter of voice or CW signals over a frequency range of 2 to 18 megacycles. Frequency coverage is accomplished by the use of plug-in tuning units. Frequency is controlled normally by Frequency Shift Exciter 0-39B/TRA-7. The master oscillator in the radio transmitter is available, in an emergency, for CW and voice operation. Power output is approximately 400 watts on CW or teletype operation and 300 watts on voice operation. The communication range of the transmitter is 1,000 miles, depending on conditions of ionosphere, terrain, and frequency. It requires 115-volt 50-60 cycle alternating current and draws 2,000 watts input power. The transmitter weight is approximately 400 pounds.

b. **Radio Receiver R-388/URR** is an 18-tube superheterodyne receiver with a frequency range of .5 to 30.5 megacycles in one-megacycle bands. It will receive amplitude-modulated CW, frequency shift tone, and voice signals and

when used with the frequency shift converter it will receive frequency shift radioteletype signals. The receiver draws 85 watts at 115/230 volt, 45 to 70 cycles alternating current. It weighs 45 pounds. Radio Set AN/MRC-32 contains two identical Receivers R-388/URR mounted one above the other. The bottom receiver is referred to as the Channel B receiver and the top receiver as the Channel A receiver. Frequency shift radioteletype signals may be received on a dual diversity basis by the simultaneous use of both receivers.

c. **Generator Set PU-290**, shown in Figure 56, is a complete electric generating plant, capable of delivering 10 kilowatts of AC power (single-phase 60-cycle at 120 volts) for the operation of Radio Set AN/MRC-32. It consists of an engine and a generator with the necessary accessories and controls (PE-95), mounted in a one-ton, two-wheel, cargo trailer.

d. **Accessories and spare parts.**—Radio Set AN/MRC-32 is a completely equipped radio and radioteletype station. In addition to the principal components, the set contains a radioteletypewriter control, a speech amplifier, an antenna tuning unit, a perforator transmitter and teletypewriters. Various accessories include test equipment for maintenance and repair, a field telephone, keys, microphones, loudspeaker, rectifiers, line units, headsets, and spare cords and cables. Running spares provided for Radio Set AN/MRC-32 include spare operating components and spare pluck-out parts.

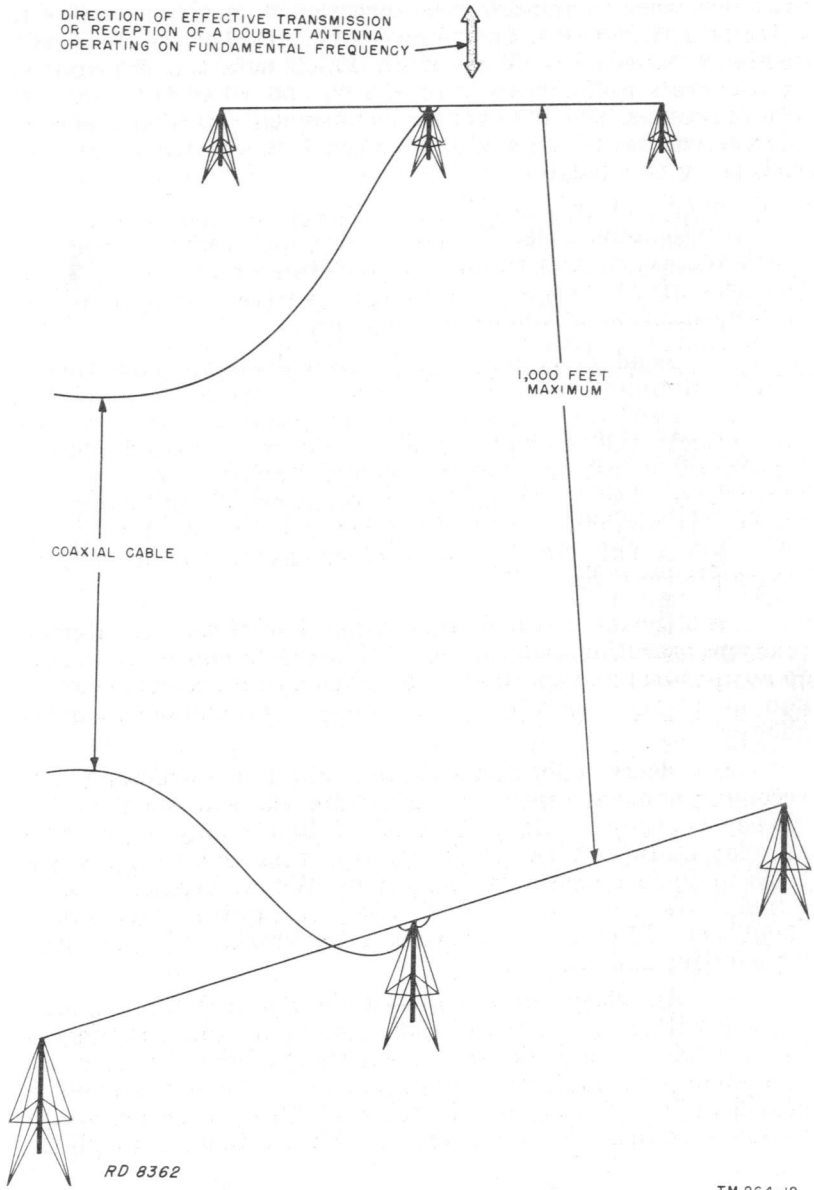
68. Types of Operation.—a. **Mobile.**—The term mobile describes the operation of the set while the vehicle on which it is mounted is actually in motion. Radio Set AN/MRC-32 is designed for mobile operation only with one-way service.

b. **Mobile-at-halt.**—The term mobile-at-halt describes operation of the set while the vehicle on which it is mounted is at halt, but may be made mobile with a minimum of preparation. Frequently mobility can be resumed with no other preparation than starting the vehicle engine. Full-duplex or one-way service may be used for mobile-at-halt operation.

c. **Semifixed.**—The term semifixed describes operation of the set when receiving and transmitting doublets are erected. (Figure 61). The shelter may or may not be mounted on a vehicle. Full-duplex or one-way service may be used. Dual diversity reception is usually used except for low operating frequencies; insufficient material is supplied to construct the two receiving doublets for low operating frequencies.

69. Types of Service.—a. **Full-duplex.**—In any radio circuit in which two separate frequencies are provided, it is possible for two radio stations to transmit and receive radioteletype messages simultaneously. The system of operation is termed full-duplex operation. One teletype is used for sending and a second teletype is used for receiving at each location.

DIRECTION OF EFFECTIVE TRANSMISSION
OR RECEPTION OF A DOUBLET ANTENNA
OPERATING ON FUNDAMENTAL FREQUENCY



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Figure 61.—Radio Set AN/MRC-32, doublet antenna set-up.

b. **One-way.**—In radioteletype operation, the term one-way describes to-and-fro (one direction at a time) service in which the transmitter and receiver of each set are never operating simultaneously. The switch which puts the transmitter into operation disables the receivers, and when the receivers are operating, the transmitter is disabled. One-way service always will be used for mobile operations and when only one frequency is available.

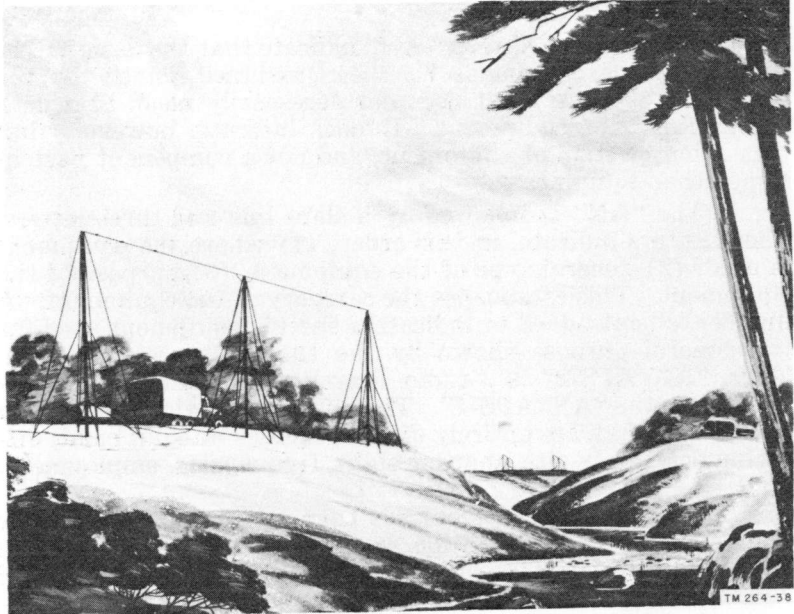
70. Types of Reception. — a. **Single channel.**—The term single channel describes reception in which only one receiver (with its associated antenna) is operating at a time. In Radio Set AN/MRC-32, Channel A (upper) receiver and antenna are usually used for single channel reception.

b. **Dual diversity.**—Dual space diversity reception is used to minimize the effects of selective fading at the individual antenna associated with each radio receiver. To minimize such effects, the receiver doublet antennas are spaced approximately 1,000 feet or three wavelengths apart and the output of each receiver, both of which are tuned to the same frequency, is combined in the Dual Diversity Converter so that when the signal fades in one receiver circuit, the other takes over and vice versa.

71. Additional Normal Operating Facilities.—a. **Remote teletype operation.**—Radio Set AN/MRC-32 can be connected to any neutral teletype land line. This permits remote teletype equipment to be operated with, or instead of, equipment in the shelter.

b. **Relay operation.**—When radio transmitting and receiving stations are too far apart for the equipment or frequency being used, Radio Sets AN/MRC-32 may be operated as relay stations between the transmitting and receiving stations to ensure good communications. When operated as a receiving station, the received and transmitted frequencies should be different to prevent interference between local transmitter and receiver.

c. **Auxiliary equipment.**—Radio Set AN/MRC-32 may be used with many standard radio communication equipments. The type to be used depends upon the tactical situation and individual communication requirements. An extra shelf is provided in the front of Shelter S-55/GRC to accommodate auxiliary equipment, and a separate whip antenna is available.



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Figure 62.—Siting Radio Set AN/MRC-32, a possible antenna location.