

WAR DEPARTMENT TECHNICAL MANUAL

TM 11-600

*This manual supersedes TM 11-600, Radio Sets SCR-508-(\*), SCR-528-(\*), and SCR-538-(\*), 25 March 1943; including C 1, 19 January 1944; and C 2, 20 January 1945*

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RADIO SETS SCR-508-A, C, D,  
AM, CM, DM;  
SCR-528-A, C, D, AM,  
CM, DM; and AN/VRC-5

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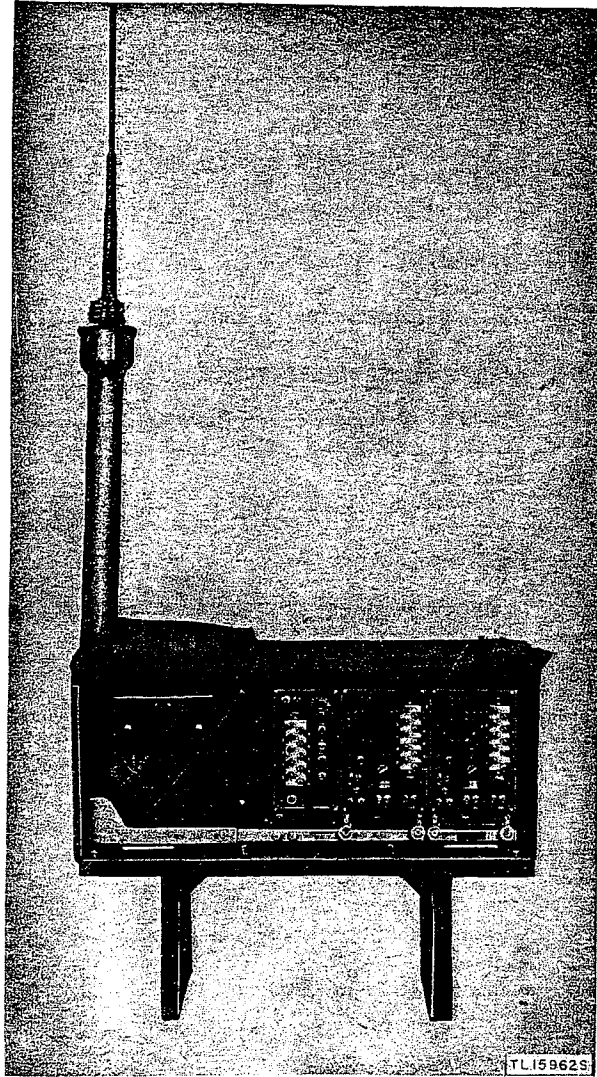
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*Figure 1. Radio Set SCR-508-(\*).*

## PART ONE

### INTRODUCTION

#### Section I. DESCRIPTION OF RADIO SETS SCR-508-(\*), SCR-528-(\*), AND AN/VRC-5

##### I. General

a. Radio Sets SCR-508-(\*), SCR-528-(\*), and AN/VRC-5 provide frequency-modulated (f-m) radiotelephone facilities. The radio sets may be installed and operated in combat vehicles such as tanks, scout cars, half-tracks, and command cars, or any other authorized vehicles (fig. 1).

b. Radio Set SCR-508-(\*), consists basically of Radio Transmitter BC-604-(\*), and two Radio Receivers BC-603-(\*), (fig. 2). The transmitter provides f-m, radiotelephone transmitting facilities for anti-aircraft and anti-tank warning and control nets, for base stations at battalion command posts for fire control and fire-direction nets, and for intrabattalion communication. The receivers provide f-m radiotelephone reception facilities for car, platoon, company, battalion, and regimental commanders, and for staff officers and commanders in higher echelon.

c. Radio Set SCR-528-(\*), consists mainly of one Radio Transmitter BC-604-(\*), and one Radio Receiver BC-603-(\*), (fig. 2).

d. Radio Set AN/VRC-5 is used for intercommunication with Radio Set SCR-508-(\*). It consists of Radio Receiver BC-603-(\*), and Radio Transmitter BC-604-(\*), mounted on Mountings FT-346 and FT-508, respectively.

e. Radio Sets SCR-508-A, SCR-508-C, and SCR-508-D are identical except that equipments marked with issue letters C and D include modifications. The same is true of Radio Sets SCR-528-A, C, and D.

f. Later models of Radio Sets SCR-508-(\*), have been modified by the manufacturer and incorporate all or most of the first 10 modification work orders. The nameplates of the basic components of these equipments are marked with the letter M following the nomenclature of the equipment thus: Radio Receiver BC-603-(\*),M. The radio sets are designated as Radio Sets SCR-508-AM, CM, and DM. The same is true of later models of Radio Sets SCR-528-(\*). These modified equipments will be referred to in the manual as Radio Sets SCR-508-(\*),M, and SCR-528-(\*),M, whereas the SCR-508-A, C, and D models and SCR-528-A, C, and D will be referred to as the unmodified earlier models of Radio Sets SCR-508-(\*), and SCR-528-(\*), respectively.

g. Official nomenclature followed by (\*) is used to indicate all models of the item of equipment included in this technical manual. Thus Radio Set SCR-508-(\*), represents Radio Sets SCR-508-A, C, D, AM, CM, and DM.

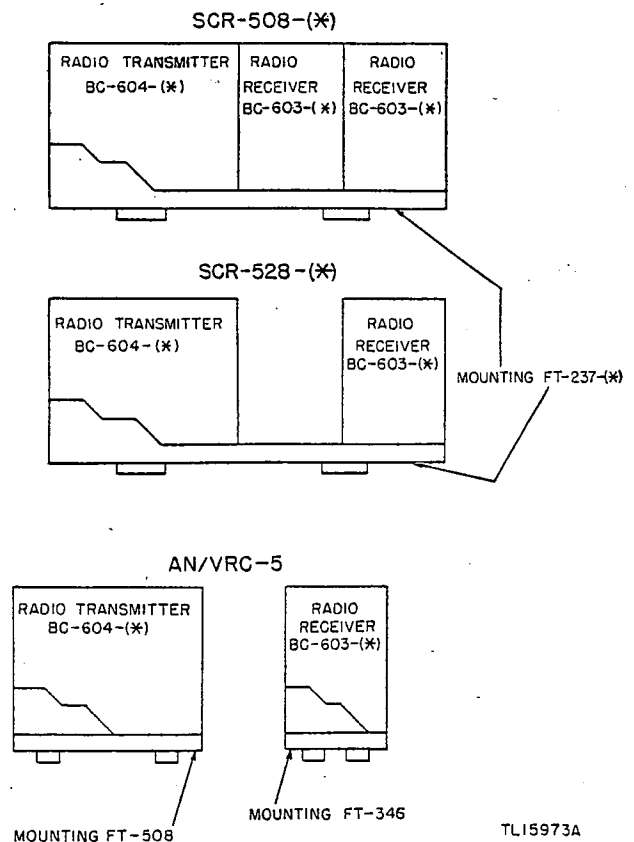


Figure 2. Radio Set SCR-508-(\*), SCR-528-(\*), AN/VRC-5, basic components.

## 2. Application of Equipment

a. A simple block diagram of a communication system using Radio Set SCR-508-(\*) in each of two vehicles is shown in figure 3. Each radio station may transmit on any one of 10 channels and receive on any one of 20 preset channels. Radio Receiver BC-603-(\*) may also be tuned manually to any frequency in the range 20 to 27.9 megacycles (mc). Two-way communication may be established between the stations by use of a single channel, or by use of two channels. Hence, each station may operate in the same or several tactical nets and in liaison channels according to the plan of combat operation. The antenna at each station is connected to the two radio receivers during stand-by periods and to the transmitter during transmission. An interphone system using the transmitter audio stages is provided for communication between vehicle members.

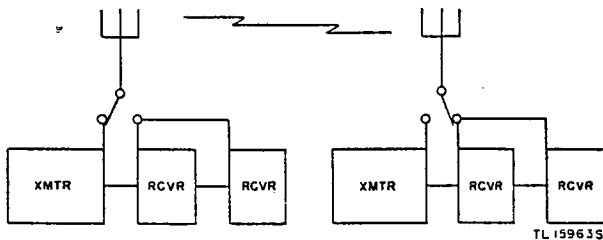


Figure 3. Radio Set SCR-508-(\*), simple block diagram.

b. The block diagram of a communication system using Radio Set SCR-528-(\*) is similar to the system using Radio Set SCR-508-(\*). However, the number of preset receiving channels is reduced to 10 as only one receiver is provided.

c. Radio Set AN/VRC-5 is essentially the same as Radio Set SCR-528-(\*), except that two mountings are used.

d. Figure 4 shows the location of the radio set in the frequency spectrums. This figure also shows other radio sets with which Radio Sets SCR-508-(\*), SCR-528-(\*), and AN/VRC-5 can communicate.

## 3. Technical Characteristics

### a. RADIO TRANSMITTER BC-604-(\*).

Frequency range:

10 preset channels....20.0 to 27.9 megacycles (mc) (80 channels).

Frequency range (Cont.)

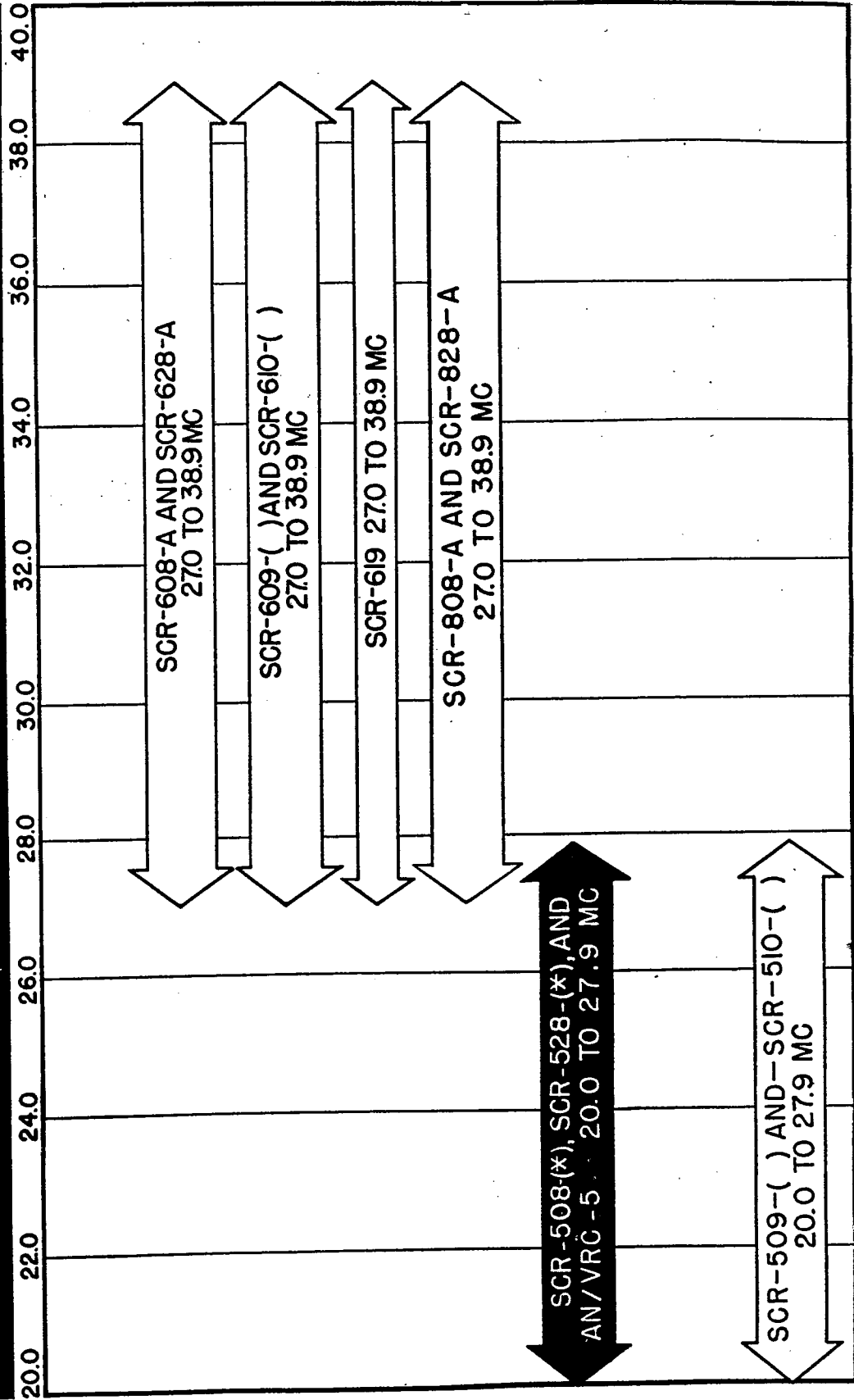
Channel spacing.....100 kilocycles (kc)  
 Crystal frequency....370.370 to 516.667 kc  
 Transmitter type....f-m  
 Type of signal transmitted .....voice  
 Distance range.....10 to 15 mi †  
 Type of modulation.....phase modulator coil  
 Power input:  
 12-volt input.....20 amp  
 24-volt input.....12 amp  
 Nominal power output....30 w  
 Whip antenna.....10 ft long. Consists of Mast Sections MS-116, MS-117, and MS-118 mounted on Mast Base AB-15/GR.  
 Power supply.....12-v vehicular battery through Dynamotor DM-35-(\*), or 24-v vehicular battery through Dynamotor DM-37-(\*).  
 Weight .....67 lb  
 Nominal frequency deviation .....40 kc  
 Frequency multiplication..54  
 Interphone output.....3 w  
 Number of tubes.....8  
 V101, V102, V103,  
 V105, V106, V107,  
 and V108.....VT-164 or JAN-1619  
 V104 .....VT-165 or JAN-1624

### b. RADIO RECEIVER BC-603-(\*).

Frequency range.....20.0 to 27.9 mc  
 Receiver type.....superheterodyne, f-m  
 Type of signal which can be received.....voice  
 Number of preset channels.10  
 Control of channels.....local only  
 Sensitivity .....1 microvolt ( $\mu$ v)  
 Intermediate frequency (nominal) .....2.65 mc  
 Bandwidth .....80 kc  
 Power output, speaker....2 w  
 Power output, headset....0.2 w  
 Call signal.....lamp  
 Noise suppression.....squelch  
 Power input:  
 12-volt input.....4 amp  
 24-volt input.....2 amp  
 Power supply.....12-v vehicular battery through Dynamotor DM-34-(\*), or 24-v vehicular battery through Dynamotor DM-36-(\*).  
 Antenna .....Uses same antenna as transmitter  
 Weight .....35 lb

† This value is an approximation, since the range will vary considerably according to terrain and atmospheric conditions.

# FREQUENCY SPECTRUM: Megacycles



TL15951S

Figure 4. Frequency spectrum of Radio Sets SCR-508-(\*), SCR-509-(\*), and AN/VRC-5.

|                      |                       |
|----------------------|-----------------------|
| Number of tubes..... | 10                    |
| V1 .....             | VT-112 or JAN-6AC7    |
| V2 .....             | VT-112 or JAN-6AC7    |
| V3 .....             | VT-94 or JAN-6J5      |
| V4 .....             | VT-209 or JAN-12SG7   |
| V5 .....             | VT-209 or JAN-12SG7   |
| V6 .....             | VT-112 or JAN-6AC7    |
| V7 .....             | VT-90 or JAN-6H6      |
| V8 .....             | VT-107-A or JAN-6V6GT |
| V9 .....             | VT-229 or JAN-6SL7GT  |
| V10 .....            | VT-229 or JAN-6SL7GT  |

#### 4. Table of Components

a. RADIO SET SCR-508-(\*). Radio Set SCR-508-(\* is composed of a 12- or 24-volt basic

unit and an installation unit. The basic unit is common to all installations. The installation unit varies and depends upon the type of installation. The table below is the Parts Control Lists listing of components of the radio set required for its installation in a personnel carrier half-track M3A1. These components, however, will vary from time to time. Figures 5 and 6 show the components actually provided in one instance where a radio set was ordered. The 12-volt basic unit, common to all 12-volt installations, is shown in figure 5 and a typical installation unit appears in figure 6.



Figure 5. Radio Set SCR-508-(\*), basic unit. (12-volt).

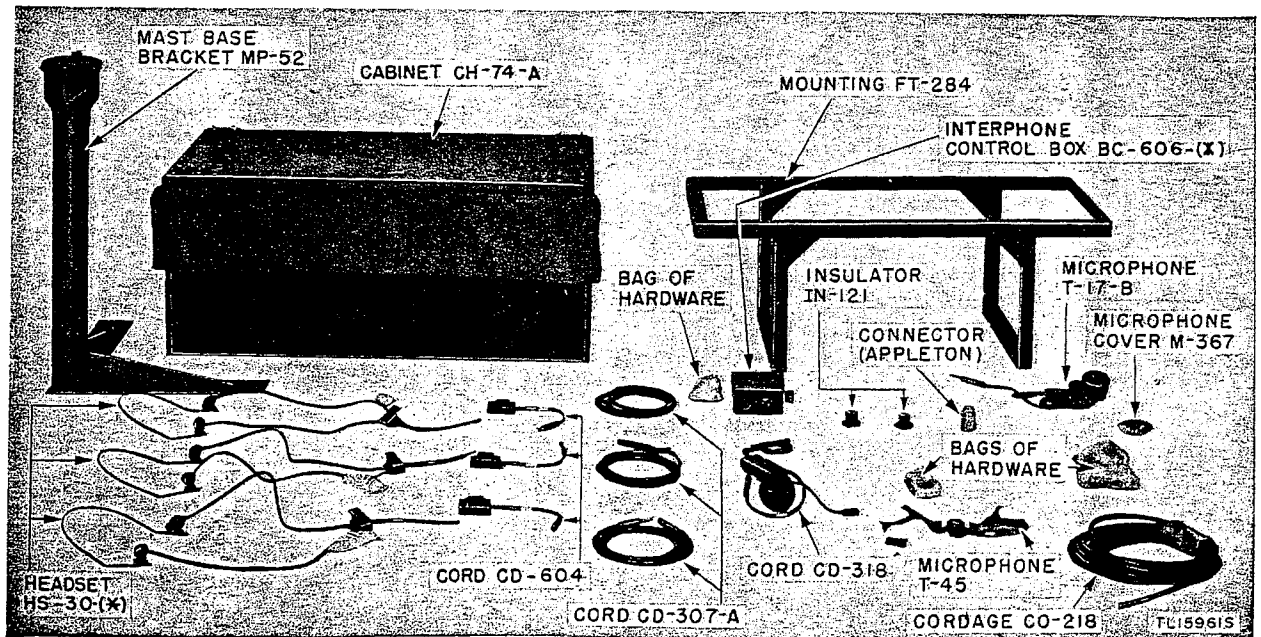


Figure 6. Radio Set SCR-508-(\*), typical installation unit.



| Component                             | Required No. | Height (in.) | Depth (in.) | Length (in.) | Volume (cu. ft.) | Weight (lb.) |
|---------------------------------------|--------------|--------------|-------------|--------------|------------------|--------------|
| <b>Basic Unit (12-volt):</b>          |              |              |             |              |                  |              |
| Antenna A-62 (Phantom) ..             | 1            | 7            | 4           | 4            | 0.06             | 3            |
| Mast Base AB-15/GR.....               | 1            | 15           |             |              |                  | 2            |
| Radio Receiver BC-603-(*).            | 2            | 11½          | 6¾          | 12½          | 0.5              | 35           |
| Radio Transmitter BC-604-(*).         | 1            | 11½          | 10¼         | 18           | 1.2              | 67           |
| Roll BG-56-A.....                     | 1            | 2            | 4           | 42           | 0.18             | 1.7          |
| Cover BG-96.....                      | 1            | 12½          | 10½         | 32           | 2.2              | 3.3          |
| Chest CH-264.....                     | 1            | 11½          | 6⅞          | 11⅞          | 0.54             | 12           |
| Dynamotor DM-34-(*),...               | 2            | 4½           | 3           | 6½           | 0.05             | 4.7          |
| Dynamotor DM-35-(*),...               | 1            | 5½           | 4½          | 8¼           | 0.1              | 9.2          |
| Mounting FT-237-(*),...               | 1            | 5½           | 13          | 33⅞          | 1.37             | 44           |
| Mast Section MS-117.....              | 2            |              |             | 39½          |                  | 0.7          |
| Mast Section MS-118.....              | 2            |              |             | 39¾          |                  | 0.8          |
| Wire W-128.....                       | 6 ft.        |              |             | 72           |                  | 0.4          |
| Connector (conduit).....              | 1            |              |             | 1¾           |                  | 0.3          |
| <b>Installation Unit:</b>             |              |              |             |              |                  |              |
| Interphone Control Box BC-606-H ..... | 1            | 4¼           | 2¼          | 4¼           | 0.06             | 1.8          |
| Cabinet CH-74.....                    | 1            | 18           | 16          | 36           | 5.9              | 92           |
| Cordage CO-218.....                   | 18 ft.       |              |             | 252          |                  | 1.4          |
| Mounting FT-284.....                  | 1            | 5            | 12          | 33           | 1.12             | 26           |
| Headset H-16/U.....                   | 2            |              |             |              |                  | 1.0          |
| Cover CW-110/U.....                   | 1            |              |             |              |                  | 0.01         |
| Mast Base Bracket MP-52..             | 1            | 26           |             |              |                  | 20           |
| Microphone T-17.....                  | 1            |              |             |              |                  | 0.7          |
| Microphone T-45.....                  | 1            |              |             |              |                  | 1.8          |
| Chest Set TD-4.....                   | 2            |              |             |              |                  | 1            |
| Bag of hardware.....                  | 1            |              |             |              |                  | 2            |
| Connector (conduit).....              | 1            |              |             | 1¾           |                  | 0.3          |
| TM 11-2721.....                       | 1            |              |             |              |                  | 0.3          |

*Note.* This list is for general information only. See appropriate publications for information pertaining to requisition of spare parts.

b. RADIO SET SCR-528-(\*). Radio Set SCR-528-(\*) is identical to Radio Set SCR-508-(\*), except that Radio Set SCR-528-(\*) has one Receiver BC-603-(\*) instead of two. (See fig. 2.)

c. RADIO SET AN/VRC-5. Radio Set AN/VRC-5 is identical to Radio Set SCR-528-(\*)

except that Radio Set AN/VRC-5 has two separate mountings, FT-346 and FT-508, for the receiver and transmitter, respectively. (See fig. 2.) A typical installation of Radio Set AN/VRC-5 is illustrated in figure 7. Weights and dimensions of the mountings used in this set are shown in the following table.

| Component            | Required No. | Height (in.) | Depth (in.) | Length (in.) | Volume (cu. ft.) | Weight (lb.) |
|----------------------|--------------|--------------|-------------|--------------|------------------|--------------|
| Mounting FT-346..... | 1            | 3⅞           | 7           | 11¼          | 0.2              | 6            |
| Mounting FT-508..... | 1            | 4½           | 9½          | 19½          | 0.3              | 14.7         |

*Note.* This list is for general information only. See appropriate publications for information pertaining to requisition of spare parts.

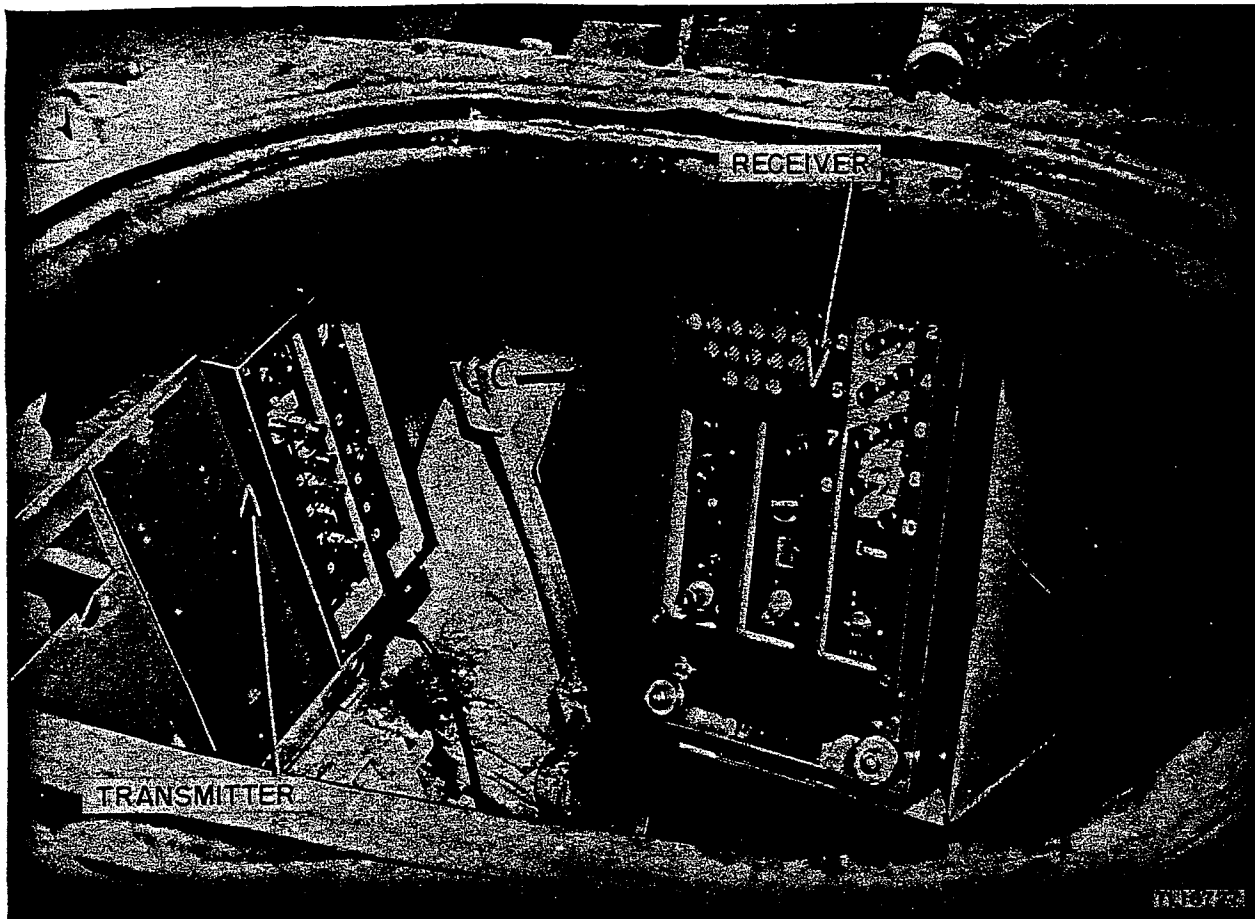


Figure 7. Radio Set AN/VRC-5, mounted in Twin 40-mm Gun Motor Carriage, M19.

## 5. Packaging Data

a. Radio Set SCR-508-(\*) is packed in seven wooden boxes, six of which contain the components of the basic unit and one of which contains the installation unit. Radio Set SCR-528-(\*) is packed in six boxes, or one less than required for the SCR-508-(\*), since it includes one receiver instead of two.

b. Domestic and export packaging and packing are the same for both sets except that moistureproof and vaporproof barriers, desiccant, and waterproof box liners or bags are not required for domestic packing. The following table lists the dimensions, volume, and weight of the boxes containing Radio Set SCR-508-(\*).

*Note.* Items may be packaged in a different manner from that shown, depending upon supply channels.

Radio Set SCR-508-(\*)

| Item      | Outside dimensions (in.) | Cubic feet (approx.) | Gross weight (lb.) |
|-----------|--------------------------|----------------------|--------------------|
| Box No. 1 | 39 x 17 x 9½             | 3.7                  | 83                 |
| Box No. 2 | 17½ x 14¾ x 12⅞          | 2                    | 65                 |
| Box No. 3 | 17½ x 14¾ x 12⅞          | 2                    | 65                 |
| Box No. 4 | 33 x 15½ x 16            | 4.7                  | 129                |
| Box No. 5 | 45 x 10½ x 6¾            | 2.8                  | 70                 |
| Box No. 6 | 21 x 13⅞ x 13⅞           | 2.2                  | 50                 |
| Box No. 7 | 40 x 26 x 25             | 14.2                 | 248                |

c. Radio Set AN/VRC-5 is packed in approximately the same manner as Radio Set SCR-528-(\*).

## 6. Radio Transmitter BC-604-(\*)

This f-m transmitter operates over a frequency range of 20.0 to 27.9 mc and delivers a carrier power to the antenna of approximately 30 watts. Figure 8 is an oblique view of the trans-

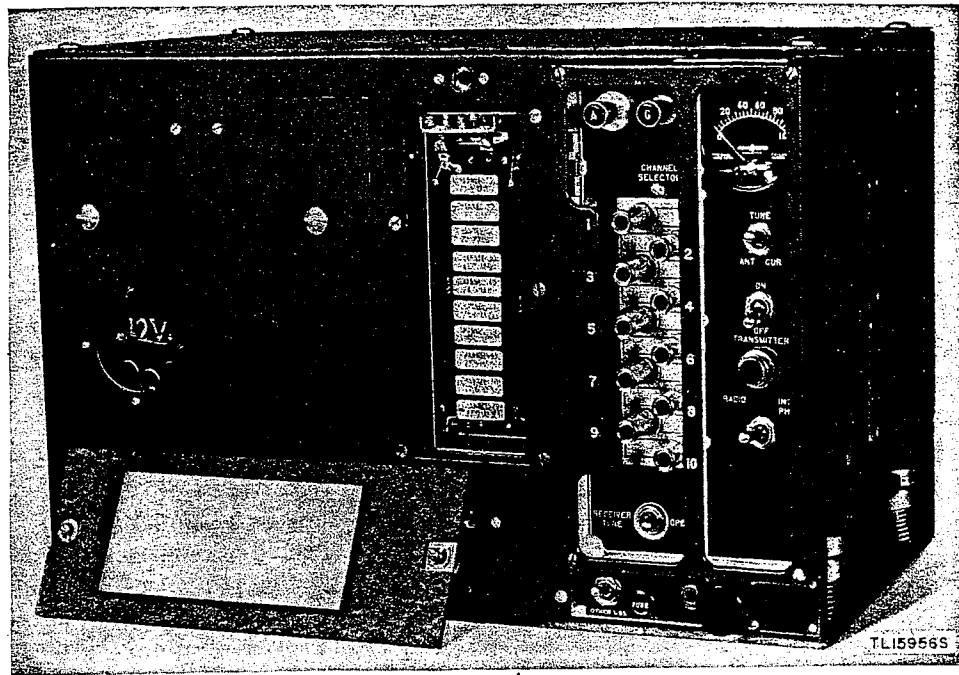


Figure 8. Radio Transmitter BC-604-(\*), with crystal unit operating compartment open, oblique view.

mitter. A view of the right-hand end of the transmitter showing the various controls and access openings is shown in figure 9. The front panel contains 10 push buttons (fig. 10) by means of which any of 10 preadjusted transmitting channels may be immediately selected. The transmitter audio stages are used to modulate the r-f carrier, and are also used for interphone operation. The use of the transmitter as a radio transmitter or as an audio amplifier is controlled at the transmitter panel or from remote interphone control boxes. When the transmitter dynamotor is on, the receiver output is disabled. Audio modulation of the transmitter is heard as sidetone in all interphone headsets. Either a carbon or a magnetic microphone may be used with the transmitter. The magnetic microphone, however, is not generally used. The transmitter receives its power from a 12- or 24-volt dynamotor mounted in the transmitter. The top and bottom dust covers can be removed by turning the fasteners  $\frac{1}{4}$  turn to the left and lifting the covers off the transmitter.

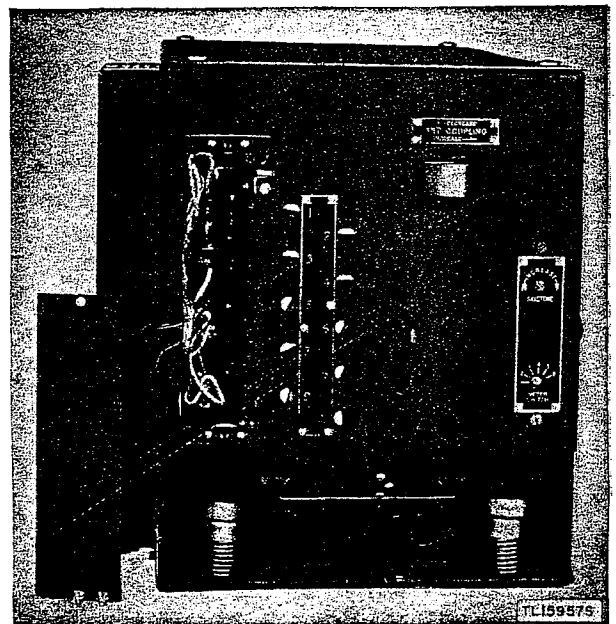


Figure 9. Radio Transmitter BC-604-(\*), with cover plate removed, right-hand view.

