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T.O. 31R1-3BC779-1
(Formerly T.O. 16-40BC779-5)
(ARMY) TM11-866
Basic & Changes No. 1, 2, 3, & 4

RADIO RECEIVERS
BC-779-A, -B; BC-794-A, -B;
BC-1004-B, -C, -D; AND R-129/U;

POWER SUPPLY UNITS
RA-74-B, -C; RA-84-A, -B; AND RA-94-A;

RADIO SETS
SCR-244-A, -B; SCR-704; AND AN/FRR-4
(HAMMARLUND SUPER PRO RECEIVER)

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Change 4, 6 APRIL 1954

TECHNICAL MANUAL

RADIO RECEIVERS BC-779-A, -B; BC-794-A, -B; BC-1004-B, -C, -D; AND R-129/U; POWER SUPPLY UNITS RA-74-B, -C, -D; RA-84-A, -B; AND RA-94-A; RADIO SETS SCR-244 A, -B; SCR-704; AND AN/FRR-4 (HAMMARLUND SUPER PRO RECEIVER)

CHANGES } DEPARTMENT OF THE ARMY
No. 3 } WASHINGTON 25, D. C., 8 April 1953

TM 11-866, 12 February 1948, is changed as follows:

10. Differences in Models

g. Power Supply Units * * * Order No. 6036-Phila-48. All information pertaining to Power Supply Unit RA-74-D with serial numbers 1 through 390 (Order No. 12618-Phila-47) and Power Supply Unit RA-74-D with serial numbers 391 through 791 (Order No. 6036-Phila-48) applies equally to Power Supply Unit RA-74-D with serial numbers 1 through 1611 (Order No. 33070-Phila-51) unless otherwise specified.

71.1 Circuit Details for Power Supply Unit RA-74-D

e. (Added). Power Supply Unit RA-74-D with serial numbers 1 through 1611, Order No. 33070-Phila-51, is electrically similar to Power

Figure 43.1. Power Supply Unit RA-74-D, with serial numbers 1 through 390, Order No. 12618-Phila-47; (On Order No. 33070-Phila-51, serial numbers 1 through 1611, tube clamp 0-1 is deleted), chassis, top view.

Figure 44.1. Power Supply Unit RA-74-D, with serial numbers 1 through 390, Order No. 12618-Phila-47; (Order No. 33070-Phila-51, serial numbers 1 through 1611, has straight instead of angular power plug), chassis, bottom view.

Supply Unit RA-74-D with serial numbers 1 through 390, Order No. 12618-Phila-47, and Power Supply Unit RA-74-D with serial numbers 391 through 791, Order No. 6036-Phila-48, except for the d-c resistance of reactor L2 and the voltage at terminals 16, 18, and 19 of power transformer T1 (figs. 45.3 and 45.4). The sequence of resistors on the terminal board is the same as for the D models with serial numbers 1 through 390, Order No. 12618-Phila-47 (fig. 44.1).

74. Trouble-Shooting Data

Take advantage of * * * following trouble-shooting data:

b. Power Supply Unit.

Fig. No.	Description
45.2	Power Supply Unit RA-74-D, with serial numbers 391 through 791, Order No. 6036-Phila-48, diagram.
45.3	Power Supply Unit RA-74-D with serial numbers 1 through 1611. Order No. 33070-Phila-51, tube socket voltages and resistances.
45.4	Power Supply Unit RA-74-D with serial numbers 1 through 1611. Order No. 33070-Phila-51, voltages and resistances.

**RADIO RECEIVERS BC-779-A, -B, BC-794-A, -B, BC-1004-B, -C, -D,
and R-129/U;
POWER SUPPLY UNITS RA-74-B, -C-D, RA-84-A, -B, and RA-94-A;
RADIO SETS SCR-244-A, -B; SCR-704; and AN/FRR-4
(HAMMARLUND SUPER PRO RECEIVER)**

CHANGES }
No. 1 }

DEPARTMENT OF THE ARMY
WASHINGTON 25, D. C., 20 May 1949

TM 11-866, 12 February 1948, is changed as follows:

That part of the title referring to Power Supply Units RA-74-B, -C is changed to read: **POWER SUPPLY UNITS RA-74-B, -C, -D**

1. General

c. The receivers are * * * their frequency ranges. This figure also shows six power supply units and their input requirements. Each of the * * * with any receiver.

f. (Added.) Power Supply Unit RA-74-* represents Power Supply Units RA-74-B, -C, and -D.

In figure 2, change designation "Power Supply Units RA-74-B, -C" to read: "Power Supply Units RA-74-B, -C, -D."

In tables I and II change RA-74-C to read: RA-74-C, -D.

8. Description of Power Supply Unit

The six power supply units are similar in appearance. Each one is * * * screws (fig. 7). This dust cover is not supplied with Power Supply Unit RA-74-D. The under side * * * supply connecting cable.

10. Differences in Models

g. (Added.) Power Supply Units RA-74-B, -C, and -D are physically and electrically interchangeable. However, Power Supply Unit RA-74-D differs from the other models in that the number of filter capacitors has been increased, additional resistors have been added, and preferred tube types are used. Moreover, the location of the resistors and capacitors in Power

Supply Unit RA-74-D with serial numbers 1 through 390, Order No. 12618-Phila-47, differs from their location in Power Supply Unit RA-74-D with serial numbers 391 through 791, Order No. 6036-Phila-48.

13. Connections and Interconnections

e. A-C INPUT. Before plugging the * * * in figure 12. The primary tap of Power Supply Unit RA-74-D is indicated in figures 44.1 and 44.2. Connect the primary * * * bottom cover plate.

Figure 12. Bottom view of Power Supply Unit RA-94-A, showing primary tap connection.

Figure 14. Power Supply Unit RA-74-B, -C, RA-84-A, -B, or RA-94-A, tube location.

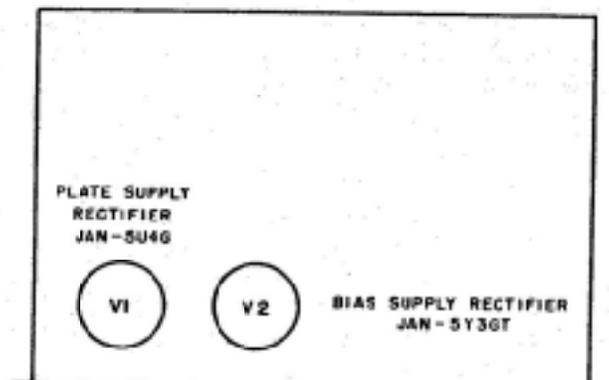


Figure 14.1 (Added.) Power Supply Unit RA-74-D, tube location.

14. Preparation for Use

a. TUBES. Check to see * * * on the receiver.

* * * * *

(2) Power supply unit. Take the dust * * * two rectifier tubes. Figures 14 and 14.1 show the location of these tubes.

* * * * *

70. Differences in Models

Power Supply Units RA-74-B, -C, RA-84-(*), and RA-94-A are electrically alike except for variations in power transformers T1, T2, and T3 (figs. 50, 51, and 52). The output of * * * input requirements vary. Power Supply Unit RA-74-D is electrically similar to Power Supply Units RA-74-B and RA-74-C except for the following: types of tubes used, d-c resistance of L2, number and values of resistors, value of plate supply filter input capacitor, values of bias filter capacitors, reference symbols, and transformer wiring connections (fig. 50.1). Also, the physical location of the resistors and capacitors in Power Supply Unit RA-74-D with serial numbers 1 through 390, Order No. 12618-Phila-47, is not the same as their location in Power Supply Unit RA-74-D with serial numbers 391 through 791, Order No. 6036-Phila.-48.

* * * * *

71. Circuit Details for Power Supply Units RA-74-B, -C, RA-84-A, -B, and RA-94-A.

* * * * *

71.1 (Added.) Circuit Details for Power Supply Unit RA-74-D.

a. Power transformer T1 (fig. 50.1) is connected to the power source by line cord W1 and is fused by 2-ampere, 250-volt fuse F1. Terminals 8 and 9 of terminal strip E1 are connected when the receiver ON-OFF switch is closed, thus completing the primary circuit of the transformer. The average power consumed is 180 watts.

b. The power unit furnishes filament, plate supply, and bias voltages to the receiver. The filament voltage, 6.3 volts ac, is obtained from secondary winding 10-11 on the transformer and applied to the receiver through terminals 1 and 2 on the terminal strip.

c. Plate supply voltage is supplied by the plate supply rectifier Tube JAN-5U4G, V1, connected in a full-wave circuit. The plates are connected to terminals 19 and 16 of the high-voltage center-tapped secondary. The center tap, terminal 17, is grounded. Filament supply for V1 is provided by secondary winding 12-13. After the voltage is rectified, it is filtered by the capacitor input pi-section filter consisting of choke L1, two 2-mf capacitors C1 and C2, and two 4-mf capacitors C3 and C4. The filtered voltage, which is connected to terminal 6, provides approximately 385 volts dc for the plates of a-f tubes V15 and V16 in the receiver. Further filtering by second filter choke L2 and two 4-mf capacitors C5 and C6 in parallel provides approximately 270 volts d-c plate and screen supply at terminal 5. Approximately 140 volts dc for screen grid supply is

obtained from the junction of resistors R1 and R2, which are part of the bleeder chain composed of bleeder resistors R11, R12, and through R4. This screen voltage is filtered by two more 4-mf capacitors C7 and C8 and is connected to terminal 4 on terminal strip E1.

d. Bias supply rectifier Tube JAN-5Y3GT, V2, is used in a half-wave rectifier circuit to supply bias voltages to the receiver. Filament supply for V2 is furnished by winding 14-15. The filament is connected to tap 18 on the high-voltage secondary. The a-c voltage across the 17 and 18 windings of the high-voltage secondary is thus applied to V2. Since tap 17 is grounded, the plate of V2 is at a negative potential. The rectified output of V2 is filtered by resistors R5 through R10 and 4-mf capacitors C9 through C12. When connected to the receiver, the voltage at the end of this filter, terminal 7 on E1, is approximately -50 volts.

74. Trouble-shooting Data

Take advantage of * * * trouble-shooting data:

* * * * *

b. POWER SUPPLY UNIT.

Fk. No.	Description
50	Power Supply Unit RA-74-B, -C, schematic diagram.
50.1	Power Supply Unit RA-74-D, schematic diagram.
*	* * * * *
45	Power Supply Unit RA-74-B, -C, RA-84-A, -B, and RA-94 A, tube socket voltage and resistance chart.
45.1	Power Supply Unit RA-74-D, tube socket voltage and resistance diagram.
45.2	Power Supply Unit RA-74-D, with serial numbers 391 through 791, Order No. 6036-Phila-48, diagram.
43	Power Supply Unit RA-94-A, chassis, top view.
43.1	Power Supply Unit RA-74-D, with serial numbers 1 through 390, Order No. 12618-Phila-47 chassis, top view.
43.2	Power Supply Unit RA-74-D, with serial numbers 391 through 791, Order No. 6036-Phila-48, chassis, top view.
*	* * * * *
44.1	Power Supply Unit RA-74-D, with serial numbers 1 through 390, Order No. 12618-Phila-47, chassis, bottom view.
44.2	Power Supply Unit RA-74-D, with serial numbers 391 through 791, Order No. 6036-Phila-48, chassis, bottom view.

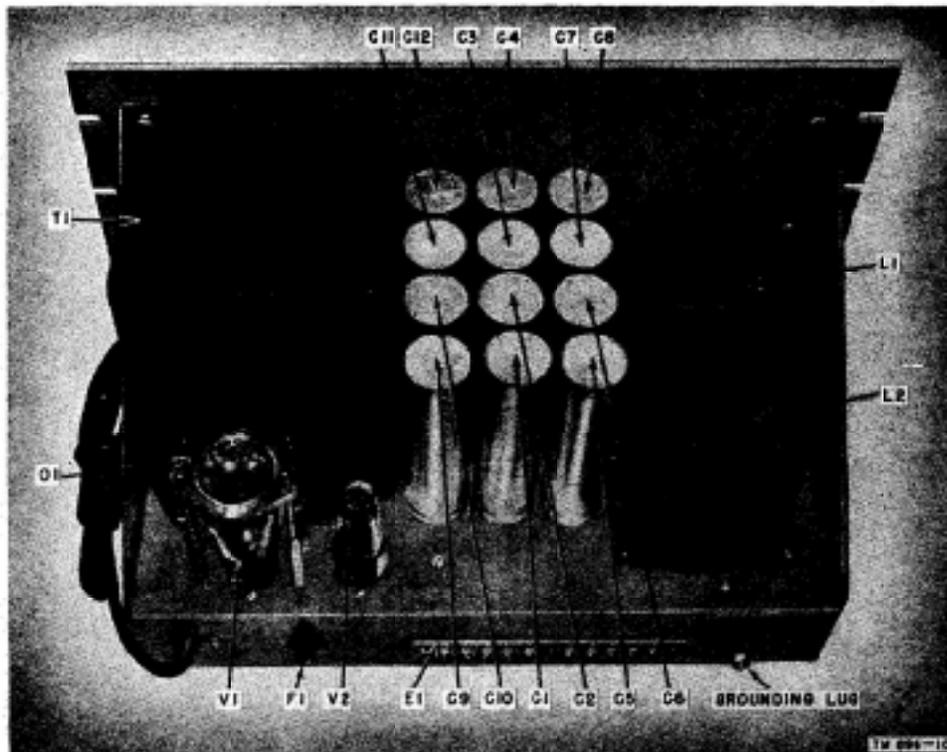
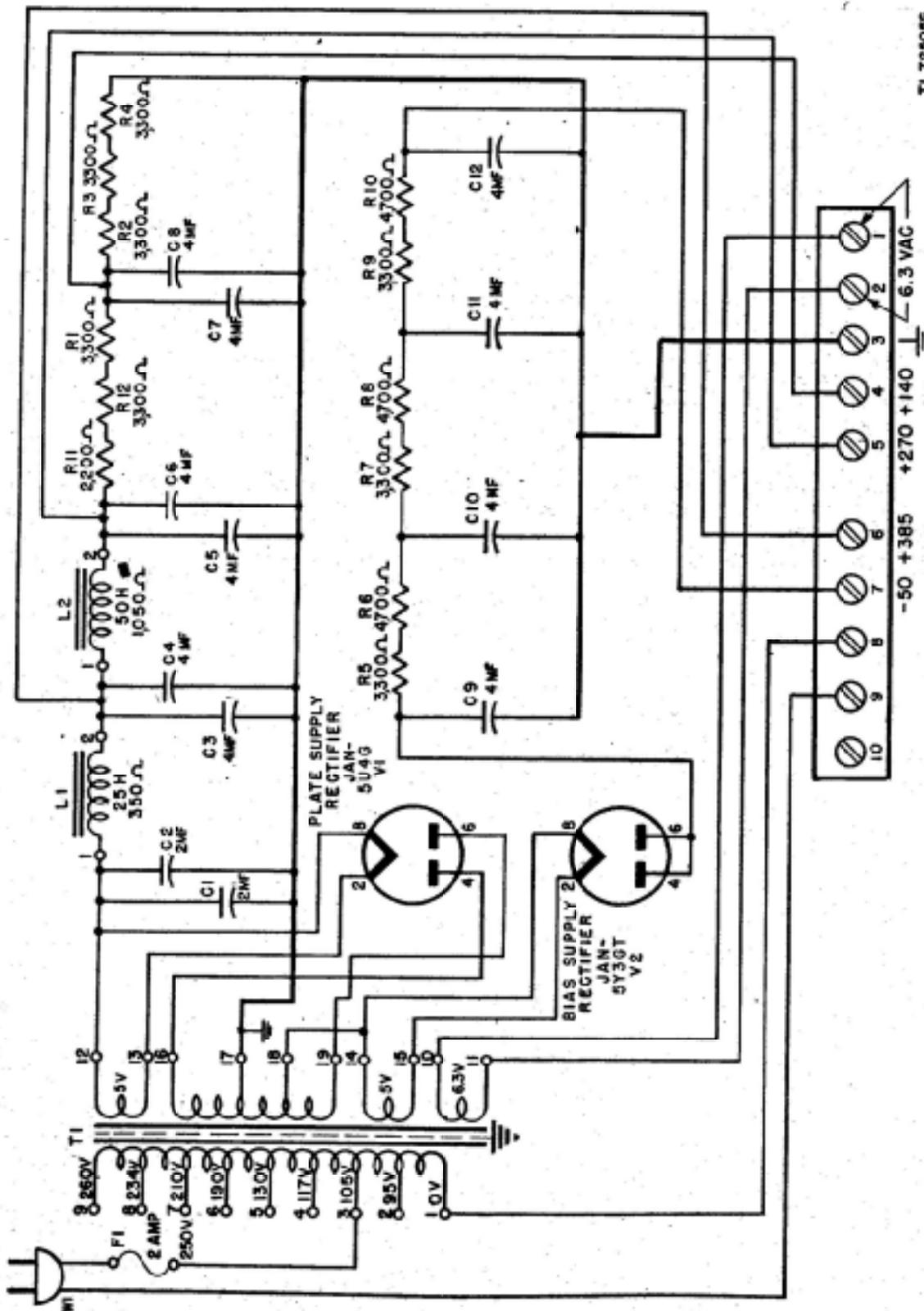


Figure 48.1 (Added.) Power Supply Unit RA-74-D, with serial numbers 1 through 390, Order No. 12618-Phila-47, chassis, top view.



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Figure 60.1 (Added.) Power Supply Unit RA-74-D, schematic diagram.

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DEPARTMENT OF THE ARMY TECHNICAL MANUAL
TM 11-866

This manual supersedes TM 11-866, 31 August 1943; TB 11-866-1, 18 May 1944; and TB 11-866-2, 30 October 1944.

RADIO RECEIVERS

BC-779-A, -B; BC-794-A, -B;
BC-1004-B, -C, -D; AND R-129/U;

POWER SUPPLY UNITS

RA-74-B, -C; RA-84-A, -B; AND RA-94-A;

RADIO SETS

SCR-244-A, -B; SCR-704; and AN/FRR-4
(HAMMARLUND SUPER PRO RECEIVER)



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PART ONE

INTRODUCTION

Section I. DESCRIPTION

1. General

a. The radio receivers described in this manual are of the superheterodyne type intended primarily for fixed station use although mountings for vehicular use may be provided. The receivers use a conventional superheterodyne circuit and are designed for the reception of either continuous-wave (c-w), or amplitude-modulated (a-m) voice or tone signals with either manual or automatic volume control (avc).

b. The receivers use an external power supply. Both the receiver and power supply (fig. 1) are designed primarily for rack mounting in standard 19-inch relay racks, but the receiver may be used as a table model by placing it into Cabinet CH-104-A. In an emergency, the receiver can be operated from batteries.

c. The receivers are functionally identical. The basic difference is that each model is designed for

a different frequency coverage. Figure 2 shows eight receiver models and their frequency ranges. This figure also shows five power supply units and their input requirements. Each of the power supply units can be used with any receiver.

d. The four Radio Sets SCR-244-A, -B, SCR-704, and AN/FRR-4 are merely different combinations of receivers and power supply units plus additional accessories such as headsets, antenna wires, insulators, etc. Figure 3 shows the radio receiver and power supply unit combinations used in the four radio sets. Note that Radio Set AN/FRR-4 consists only of the receiver and power supply unit. No headphones, antenna wires, or other accessories are included.

e. Official nomenclature followed by (*) is used to indicate all models of the item of equipment covered by this technical manual. Thus Radio Receiver BC-779-(*) represents Radio Receivers BC-779-A and BC-779-B. When the text material is equally applicable to all the receivers described in this manual, the term *receiver* will be used.

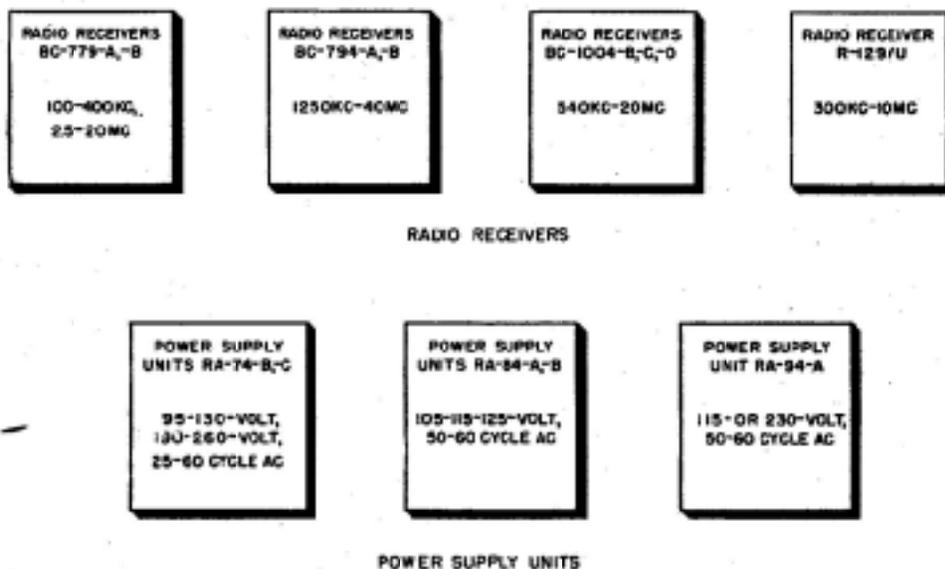


Figure 2. Radio receivers and power supply units, block diagram.

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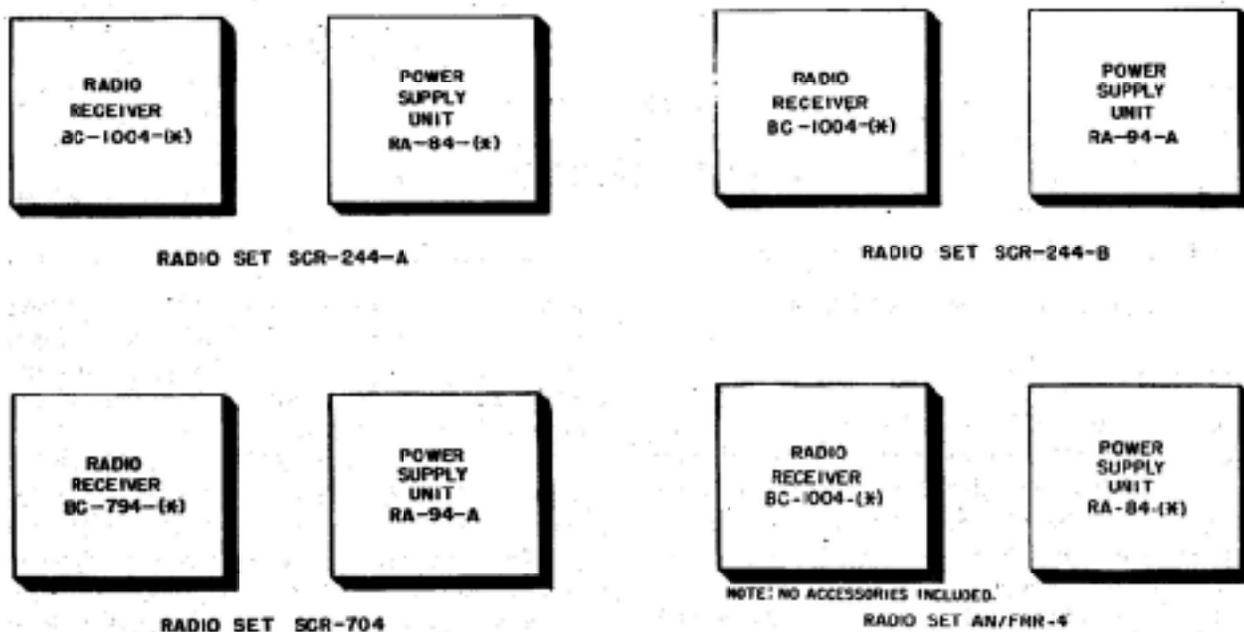


Figure 3. Radio sets, block diagram of main components.

TL 570225

2. Technical Characteristics

Frequency range (in kilocycles (kc) or megacycles (mc)):

- Radio Receiver BC-779-(*)... 100-200 kc
200-400 kc
2.5-5 mc
5-10 mc
10-20 mc
- Radio Receiver BC-794-(*)... 1,250-2,500 kc
2.5-5 mc
5-10 mc
10-20 mc
20-40 mc
- Radio Receiver BC-1004-(*)... 540-1,160 kc
1,160-2,500 kc
2.5-5 mc
5-10 mc
10-20 mc
- Radio Receiver R-129/U..... 300-540 kc
540-1,160 kc
1,160-2,500 kc
2.5-5 mc
5-10 mc

Receiver type Superhetrodyne

Types of signals which can be received C-w, tone, and voice

- Number of tubes 18
- Intermediate frequency 465 kc
- Power input 180 watts
- Power supply:
 - Power Supply Unit RA-74-(*) 95-130-volt, 190-260-volt, 25-60-cycle alternating current (ac)
 - Power Supply Unit RA-84-(*) 105-115-125-volt, 50-60-cycle ac
 - Power Supply Unit RA-94-A.. 115- or 230-volt, 50-60-cycle ac
- Battery supply One 6-volt storage battery
Five 45-volt B batteries
One 45-volt C battery
- Antenna Doublet antenna with balanced transmission line or single wire and ground