

Mixer Preamplifier, Type OP-7

Features

- Excellent frequency response to 15,000 cycles.
- High level mixing reduces noise to a minimum.
- Provides unloaded transformer input and high level mixing for one to four microphones.
- Self contained a-c power supply or may be battery operated.
- May be used with any program amplifier having a gain of 80 db.

Description

The OP-7 is a high fidelity, compact and lightweight portable unit. It provides unloaded transformer input and high level mixing for as many as four microphones. It may be used with the OP-6 Portable Amplifier or with any other program amplifier which has a gain of at least 80 db.

The front panel contains the power receptacle, "on-off" power switch, a-c fuse, four mixer knobs and shielded output terminals. A front panel cover held by two snap type clasps protects the equipment and provides space for carrying cables. Four Cannon Type "P" Microphone Receptacles are assembled on the rear of the amplifier chassis. A fifth receptacle, with male contacts, provides a cable output connection. This type of receptacle safeguards the battery from short-circuits that might occur using a male plug.

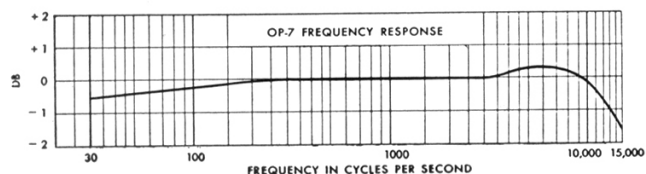
The OP-7 is equipped with long life carbon type mixing controls. In addition, the MI-11276 Modification Kit containing four Daven step-by-step attenuators with the necessary accessory equipment for modification, is available for modifying the MI-11213. The OP-7 is complete with built-in power supply or it may be operated from the MI-11214 Battery Box without circuit changes. A suitable OP-6 interconnection cable, equipped with Cannon Plugs, is furnished with the OP-7.

Specifications

Source Impedance	30/250 ohms
Load Impedance	30/250 ohms
Normal Output Level	-55 dbm
Distortion (-55 dbm output, 50-7500 cycles)	less than 0.5% rms
Maximum Output Level (less than 1% rms distortion measured at any frequency between 50 and 7500 cycles)	-24 dbm
Gain (maximum, 250 ohm source to 250 ohm load)	8 db
Frequency Response	± 2 db 30 to 15,000 cycles ± 1 db 40 to 10,000 cycles
Noise Level (-24 dbm output for 8 db gain)	-88 db
Dimensions	
Height	9 1/2"
Width	12 3/4"
Depth	9"
Finish	Gray wrinkle
Weight (unpacked but with cables)	23 lbs.
A-c Power Input, 105-125 volts, 50 to 60 cycles	20 watts
Stock Identification	MI-11213

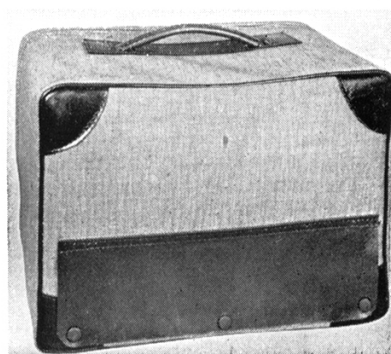
Accessories

Tube Kit (complete tube complement)	
4 RCA 1620, 1 RCA 6X5GT/G	MI-11254
Alternate Tube Kit (complete complement)	
4 RCA 6J7, 1 RCA 6X5GT/G	MI-11254-A
Weatherproof Fabric Cover	MI-11257
Battery Box	MI-11214
Kit of Batteries	MI-11255
Cannon Microphone Plugs	MI-4630-B
OP-6 Amplifier (shipped less tubes)	MI-11202-A

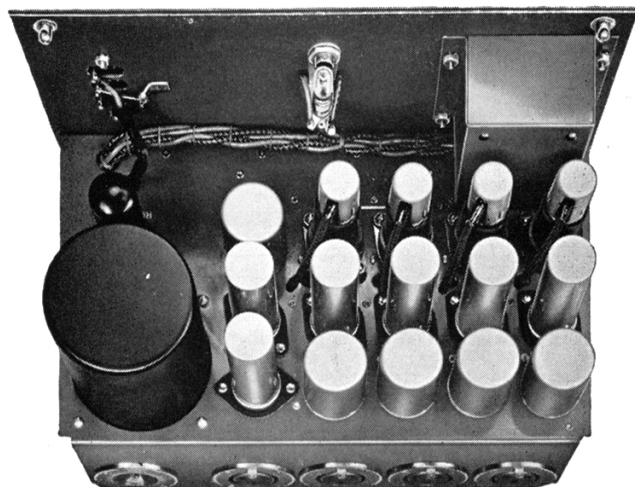


OP-7 with front panel cover removed. Covers of OP-7 and OP-6 provide space for carrying interconnecting cables.

MI-11257 Fabric Cover for OP-7. Similar covers, listed as accessories, are available for OP-6 and for the MI-11214 Battery Box.



OP-7 chassis, rear view. Four microphone receptacles and output receptacle are provided.



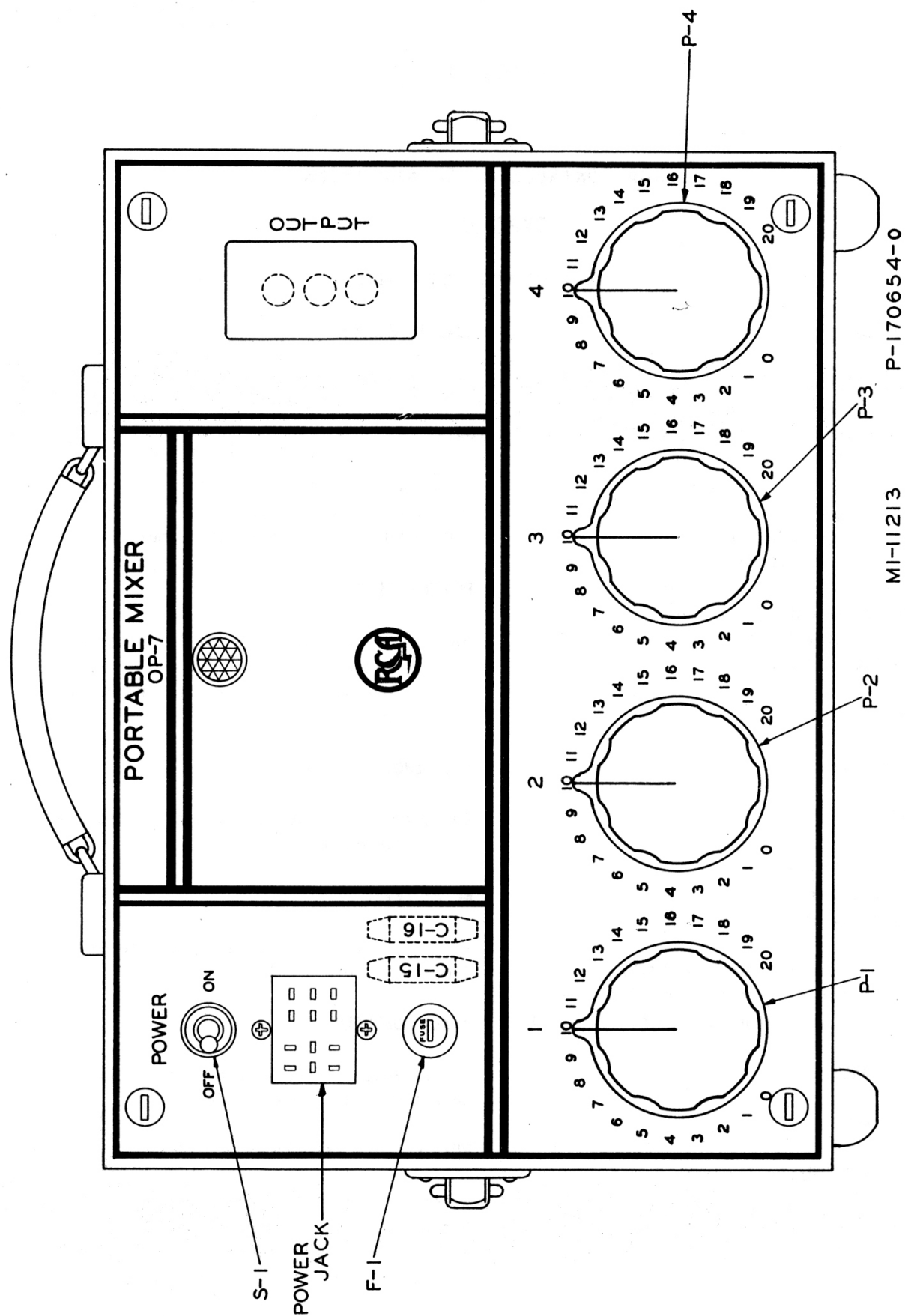


FIGURE 1 - FRONT PANEL OF TYPE OP-7 AMPLIFIER

INSTRUCTIONS
for
RCA PORTABLE MIXER AMPLIFIER
TYPE OP-7

(MI-11213 MIXER AMPLIFIER)

POWER REQUIRED

- (A) a-c Operation:
105-125 Volts
50-60 Cycles
20 Watts
- (B) d-c Operation:
Plate Voltage, 270 Volts
Plate Current, 7.0 Ma.
Filament Voltage, 6.0-7.5 Volts
Filament Current, (at 7.5 Volts)
1.5 Amp. total (Tubes 1.33 Amp.;
and Pilot 0.17 Amp.)

FUSE

a-c Line, 1 Ampere

RADIOTRONS

4 RCA-1620, or ** 4 RCA-6J7 (One tube
in each of 4 channels)
Rectifier, 1 RCA-6X5

** May be used when maximum uniformity
of characteristics, and minimum of micro-
phonics, hum and distortion are not required.

SOURCE IMPEDANCE

250 or 30 ohms

MAXIMUM INPUT LEVEL

-27 db (.001 watt reference)

*0 db = .001 Watt

LOAD IMPEDANCE

30 or 250 Ohms or higher

GAIN

8 db through each of 4 channels (250 ohm
source to 250 ohm load).
8 db when used with Type OP-6 Amplifier

POWER OUTPUT

Rated; -24 db*, with 1% total rms harmonic
distortion.
Normal; -50 db*, with 0.5% total rms harmonic
distortion.

FREQUENCY RESPONSE

+1,-2 db from 30 to 15,000 cycles, 250 ohm
source to 250 ohm load.

NOISE LEVEL

-112 db, with full gain and input terminated
(.001 watt reference)

MIXER CONTROLS

4 Dual Potentiometers, continuously vari-
able with logarithmic taper.

PHYSICAL SPECIFICATIONS

Width,	13-1/4	Inches
Depth,	9	Inches
Height	9-1/2	Inches
Weight,	23	Pounds (unpacked)

DESCRIPTION AND APPLICATION

The Type OP-7 Equipment consists of a portable mixer pre-amplifier. It is designed to be used with the Type OP-6 Amplifier, but may be used with any other similar amplifiers having a 250 ohm or 30 ohm input. This unit constitutes a complete portable mixer equipment for broadcast speech input applications.

The Type OP-7 Mixer Equipment includes four separate pre-amplifier channels with separate controls for mixing the microphone inputs. From one to four microphones may be used, and they may be of the velocity, inductor, or dynamic types with an impedance of either 250 or 30 ohms. Each of the four channels has a linear characteristic.

This mixer amplifier is designed to operate from a-c power lines. However, when so desired, a battery box (MI-11214) with power cord, may be used to furnish power to the Type OP-7 Mixer Amplifier, and if the Type OP-6 Amplifier is used along with the Type OP-7, the MI-11214 Battery Box may be used to supply power to both amplifiers. The switching between the a-c line and battery operation is accomplished by two power cords, each equipped with a multiconductor plug, and internally connected so that one cord is used for the a-c power supply and the other cord for battery operation.

The battery box, MI-11214, is designed to accommodate the required "A" and "B" batteries with additional space provided for the stowage of spare tubes, a microphone, and connecting cables. A weather-proofed cover for the MI-11214 Battery Box is stocked as MI-11258, and Battery Kit as MI-11255.

The input circuit to each of the four channels of the Type OP-7 Mixer Amplifier consists of a transformer normally connected for 250 ohm operation (30 ohm terminals on the transformers are available as described under "Audio Input Connections"). In each channel is an RCA-1620 (or RCA-6J7) triode connected. In the output circuit of each tube is an attenuator, and each attenuator is connected across the primary of the output transformer. The Type OP-7 Mixer Amplifier is designed to insure minimum cross-talk, hum and distortion.

For transporting the Type OP-7 Mixer Amplifier during inclement weather, a protective cover MI-11257 is available as an accessory. This cover is designed so that, if it is desired, the equipment may be operated without removing the cover.

A comfortable shoulder strap is furnished for carrying the amplifier when being transported or when in use. The hands are then free to hold the microphone, etc.

LOCATION AND MOUNTING

The Type OP-7 Mixer Amplifier is self contained and is especially suited for use with the Type OP-6 (or similar) amplifier when more than one microphone is to be used and the program is to be faded from one to the other, in the remote pickup of sporting events, street programs, political and social meetings, and other gatherings of a similar nature. It may also be used for semi-permanent installations. It may be carried by means of the shoulder strap provided, or may be placed on any suitable convenient support.

When used with a high gain amplifier such as the Type OP-6, due care should be exercised when using the amplifier in strong r-f fields or near a-c power lines, to prevent undesirable pickup.

AUDIO INPUT CONNECTIONS

The Type OP-7 Mixer Amplifier is provided with four microphone positions and four mixers. The microphone connections are made through four locking female receptacles provided at the rear of the amplifier. The microphone cable plugs (Cannon P3-CG-12S) are not furnished as a part of the OP-7 but may be purchased separately as MI-4630.

It should be noted that the Type OP-7 Mixer Amplifier is provided with four 250 ohm input circuits for use with one to four 250 ohm microphones. If it is desired to use one or more 30 ohm microphones, the same number of microphone receptacles must be disconnected from the 250 ohm primary of their respective input transformers (terminals 1 and 4) and connected to the 30 ohm primary terminals (2 and 3).

AUDIO OUTPUT CONNECTIONS

Audio output connections are made through a locking male type plug provided at the rear of the amplifier, and if desired, may be made through three screw terminals on the front panel. An interconnection cable complete with plugs to operate between the OP-7 & OP-6 is furnished as part of the OP-7. The Type OP-7 Mixer Amplifier is normally connected to work into a balanced load of 250 ohms (or higher) such as the input of the Type OP-6 Amplifier. However, if it is desired to work into a balanced load of 30 ohms, the output plug (and binding posts) must be disconnected from the Resistor R19, 20, 21 and the 250 ohm secondary of the output transformer T-5 (terminals 1 and 4) and connected directly to the 30 ohm terminals (2 and 3). Operation into an unbalanced load is satisfactory providing due care is exercised in selecting properly shielded cable, etc.

BATTERY CONNECTIONS

The Type OP-7 Mixer Amplifier is supplied with a power cord for a-c operation. The MI-11214 Battery Box is designed to be used with the Type OP-7 Mixer Amplifier for battery operation. This battery box contains space for 15 Burgess Type 4F "A" batteries or equivalent, and six Burgess Type B-30 "B" batteries or equivalent. This supplies a plate voltage of 270 volts d-c and a filament voltage of 7.5 volts d-c. If desired, only 10 "A" batteries may be used. The MI-11214 Battery Box is wired with plugs ready to be inserted into the above named batteries, and is supplied with a power cord for direct connection to the Type OP-7 Mixer Amplifier.

The expected battery life for an average amplifier operation of six hours per day is as follows.

EXPECTED LIFE IN HOURS (Approximately)

<u>BATTERIES BURGESS TYPE NO.</u>	<u>OP-7 ONLY</u>	<u>OP-6 and OP-7</u>
15 #4F "A"	26	7.5
10 #4F "A"	12	3.5
6 #B-30 "B"	240	95

If the mixer amplifier is used less than six hours per day, the expected life of the batteries in hours may be increased. If the amplifier is to be used continuously the life of the batteries in hours will be materially decreased.

A kit of batteries consisting of 10 Burgess #4F "A" batteries and six #B-30 "B" batteries may be purchased from the Factory as MI-11255.

MIXER CONTROLS AND OPERATION

Four mixers, numbered from 1 to 4, are provided on the front of the panel for mixing the microphone inputs. The numbers of the mixers correspond with the numbers near the microphone receptacles. When using the Type OP-7 Mixer Amplifier with the Type OP-6 (or similar) amplifier, the best signal to noise ratio is obtained when the OP-7 is operated with plus gain, the nearer maximum the better.

When the equipment is set up for operation turn power switch "On" and before broadcasting has commenced turn all volume and mixer controls being used full on; and check carefully for extraneous noises. Care should be taken that the amplifiers, microphones, and microphone cables are not near a-c power lines, or in strong a-f or r-f fields.

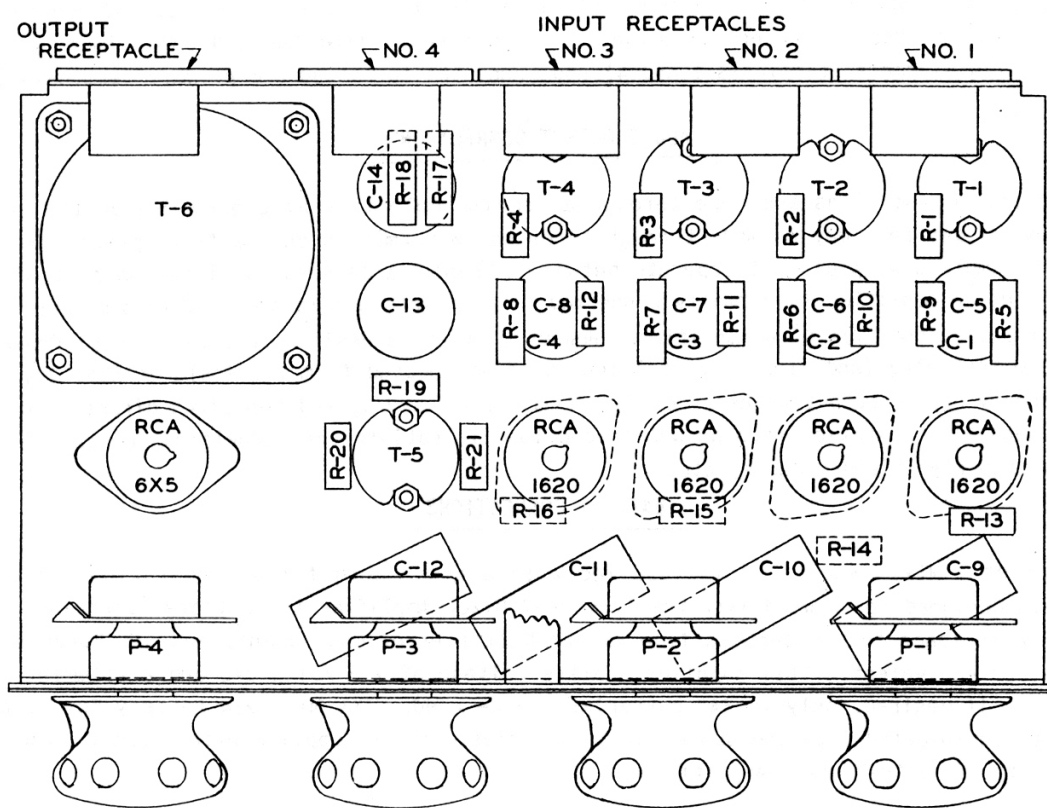


FIGURE 3 - LOCATION OF PARTS - TYPE OP-7 AMPLIFIER

ACCESSORIES FOR TYPE OP-7 MIXER AMPLIFIER

The following units are classified as accessories and are not included with the Type OP-7 Pre-Amplifier:

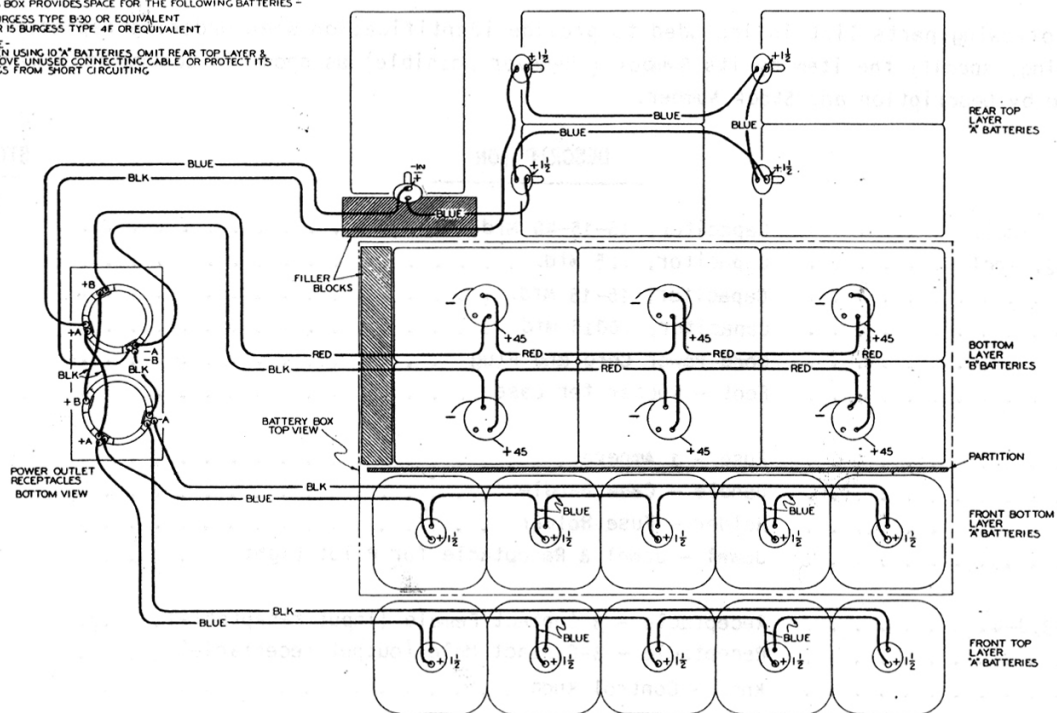
Cable Plug (Cannon P3-CG-12S For Microphone Cable)	MI-4630-B
Kit of Tubes for Type OP-7 Pre-Amplifier	MI-11254
Weatherproofed Cover for Type OP-7 Pre-Amplifier	MI-11257
Battery Box (Including Power Cable)	MI-11214
Kit of Batteries	MI-11255
Weatherproofed Cover for Battery Box	MI-11258
Portable Remote Amplifier Type OP-6	MI-11202
Weatherproofed Cover for Type OP-6 Amplifier	MI-11256
VU meter Kit for OP-6	MI-11251
Kit of Tubes for OP-6	MI-11253

REPLACEMENT PARTS LIST

The following parts list is included to provide identification when ordering replacement parts. When ordering, specify the item by its Symbol (whenever possible) as shown in Schematic Diagram, figure 2, followed by Description and Stock Number.

SYMBOL	DESCRIPTION	STOCK NUMBER
C-1 to C-8, Incl.	Capacitor, 15-15-40 Mfd.	34150
C-9 to C-12, Incl.	Capacitor, .25 Mfd.	30849
C-13, C-14	Capacitor, 15-15 Mfd.	18806
C-15, C-16	Capacitor, .0015 Mfd.	13762
---	Cord-Power Cord and Plug	32098
---	Foot - Rubber for Case	23222
F-1	Fuse - 1 Ampere	14133
---	Handle - Case Handle	30925
---	Holder - Fuse Holder	32059
---	Jewel - Jewel & Receptacle for Pilot Light	32804
J-1, J-2, J-3, J-4.	Receptacle - 3 Contact Female (input receptacle)	25598
J-5	Receptacle - 3-Contact Male (output receptacle)	20962
---	Knob - Control Knob	17269
---	Lamp - Pilot Lamp	4340
P-1, P-2, P-3, P-4.	Control - Volume Control	43390
---	Plug - Plug for Coupling Cable (3-prong male)	25597
---	Plug - Power Plug	19679
R-1, R-2, R-3, R-4.	Resistor - 1,200 ohms 1/2-watt	30731
R-5, R-6, R-7, R-8.	Resistor - 100,000 ohms 1-watt	3058
R-9, R-10, R-11, R-12	Resistor - 27,000 ohms 1/2-watt	30409
R-13, R-14, R-15, R-16.	Resistor - 47,000 ohms 1/2-watt	30787
R-17	Resistor - 4,700 ohms 1-watt	30788
R-18	Resistor - 470,000 ohms 1-watt.	36243
R-19	Resistor - 4,700 470 ohms 1/2-watt <i>470 ohms</i>	30499
R-20, R-21.	Resistor - 820 82 ohms 1/2-watt <i>82 ohms</i>	13961
---	Receptacle - Receptacle for Coupling Cable (3-prong female)	25596
---	Strap - Shoulder Strap	43277
S-1	Switch - Power Switch	15374
---	Socket - Socket for Power Cord	17613
---	Socket - Socket for RCA-6x5 Tube	35308
---	Socket - Socket for RCA-1620 Tube	28413
T-1, T-2, T-3.	Transformer - Input and Output Transformer	19957
T-4, T-5	Transformer - Power Transformer	19955
T-6	Transformer - Power Transformer	19955

THIS BOX PROVIDES SPACE FOR THE FOLLOWING BATTERIES -
 6 BURGESS TYPE B30 OR EQUIVALENT
 6 OR 6 BURGESS TYPE 4F OR EQUIVALENT
 NOTE -
 WHEN USING 10" A" BATTERIES OMIT REAR TOP LAYER &
 REMOVE UNUSED CONNECTING CABLE OR PROTECT ITS
 PLUGS FROM SHORT CIRCUITING



MI-11214 T-160457-0

FIGURE 4 - MI-11214 BATTERY BOX CONNECTIONS

RCA VICTOR DIVISION

RCA MANUFACTURING COMPANY, INC.

Camden, N. J.,

U. S. A.

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