

I N S T R U C T I O N S
f o r
R C A I S O L A T I O N A M P L I F I E R
T Y P E 8 3 - C
(MI-11206-B)

POWER REQUIRED

105-125 Volts
50-60 Cycles
60 Watts

FUSE

AC Line, 1 Ampere, Stock #14133.

RADIOTRONS

1st Stage - 1 RCA-1620, or *1 RCA-6J7
2nd Stage - 2 RCA-1621, or *2 RCA-6F6
Rectifier, - 1 RCA-5Y3G

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

SOURCE IMPEDANCE

500-600 Ohms

INPUT IMPEDANCE

Bridging, 26,000 Ohms
Matching, 590 Ohms

MAXIMUM INPUT LEVEL

+30 vu* for Matching, or
+46 vu* for Bridging, at
1,000 Cycles per Second.

OVERALL GAIN

Bridging Input, 33 db
Matching Input, 50 db

POWER OUTPUT

(From 50 to 7,500 Cycles)

Normal: 0.5 watt (+27 vu*) with
1% total R.M.S. Harmonic
Distortion.

FREQUENCY RESPONSE

±1 db of 1,000 Cycles from 30 to
10,000 Cycles, with Bridging or
Matching Input and with 500-Ohm
Load on 500-Ohm Output. See
"Audio Input Connections" page 3.

NOISE LEVEL

-52 db below 1 MW, Maximum, with
Input terminated, Gain Maximum,
and Hum Potentiometer Adjusted
for Minimum.

LOAD IMPEDANCES

500-600/250/125/62.5/10.5 Ohms

MOUNTING

Shelf Mounting. Either One or Two
Type 83-C Amplifiers may be rack-
Mounted through the use of a Type
36-A or 36-B Panel and Shelf
Assembly.

PHYSICAL SPECIFICATIONS

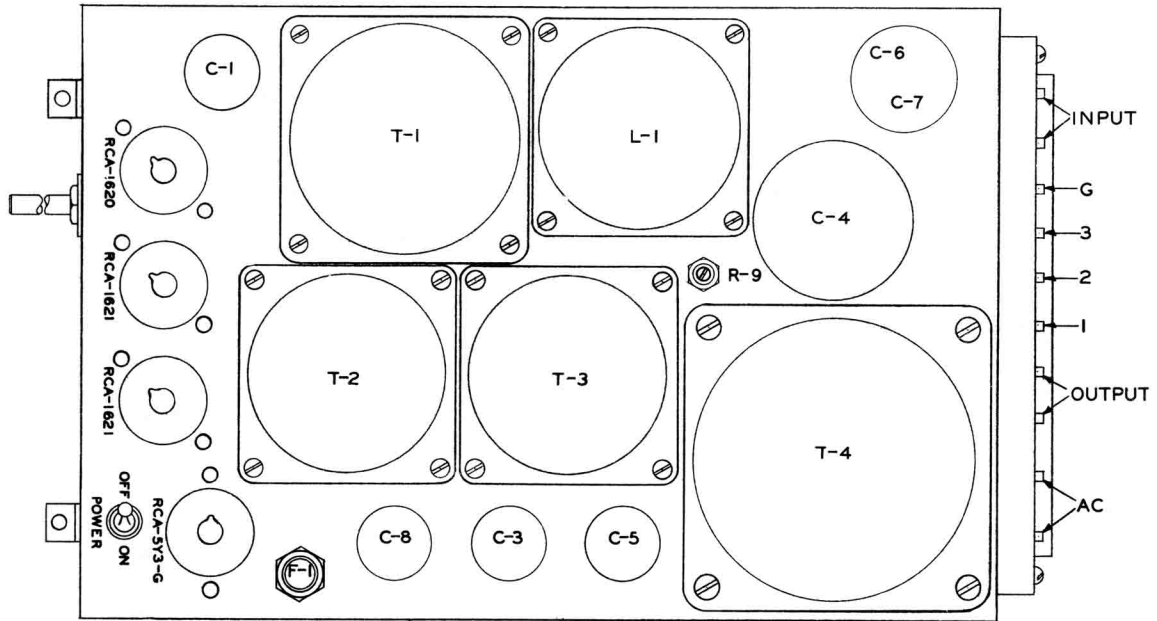
Width - 8 Inches
Depth - 12 3/4 Inches
Height - 7 1/2 Inches
Weight - 20 Pounds

D E S C R I P T I O N A N D A P P L I C A T I O N

The Type 83-C Isolation Amplifier has been designed especially for use in Broadcast Speech Input installations as a line bridging amplifier, but it can also be used as a monitoring amplifier where large outputs are not required.

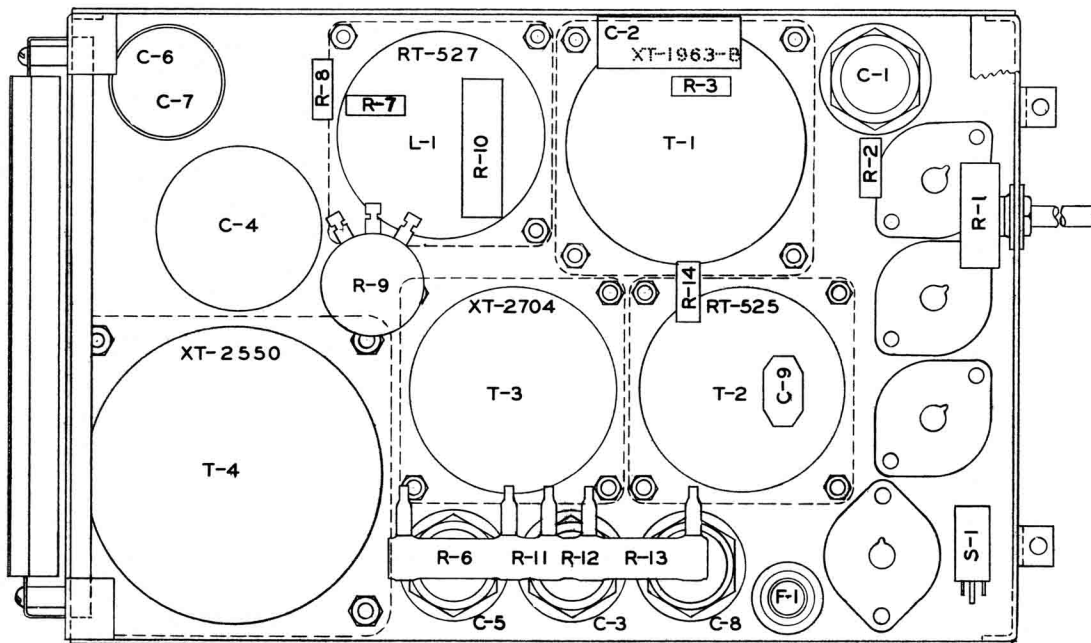
(Continued on page 3)

*vu - db above 1 MW Reference Level.



MI-11206-B P-170558-0

FIGURE 1 - TOP VIEW OF TYPE 83-C AMPLIFIER.



MI-11206-B P-170557-0

FIGURE 2 - BOTTOM VIEW OF TYPE 83-C AMPLIFIER.

LOCATION AND MOUNTING

Either one or two Type 83-C Amplifiers may be mounted on a Type 36-A or 36-B Panel and Shelf Assembly, the mounting instructions being the same as specified for the Type 83-B Amplifier. The amplifier should be fastened to the panel and shelf by means of the machine screws supplied with the amplifier.

The Type 83-C Amplifier may be mounted in other ways, but care should be taken always to mount the amplifier on a metal base, such as provided by the Type 36-A or 36-B Panel and Shelf, in order to obtain the maximum signal-to-noise ratio. This unit is designed so that it is permissible to mount it with the sides of the chassis horizontal.

The mounting brackets are usually turned inside the chassis for shipping purposes, and must be removed and turned outside the chassis for mounting purposes.

Avoid placing the amplifier near a source of extraneous interference.

AMPLIFIER CONNECTIONS

All permanent connections are made to the amplifier through a common terminal board having 10 screw type terminals and located at the rear of the amplifier. These terminals are appropriately marked.

The ground terminal of the MI-11206-B Amplifier should be at all times connected to a suitable ground.

AUDIO INPUT CONNECTIONS

The input terminals of the amplifier are normally connected to bridge a 500-ohm line with a 20,000-ohm input, and in this case the "INPUT" terminals will be found connected within the amplifier to the 20,000-ohm primary of the input transformer T-1, (terminals 1A and 3B).

When desired, however, the amplifier may be used to match a 500-600-ohm line (for example, as a line booster), and in this case the input terminals within the amplifier should be removed from the 20,000-ohm primary of the input transformer T-1 (terminals 1A and 3B), and connected to the 500-600-ohm primary of the input transformer T-1, (terminals 1A1 and 3B1).

IMPORTANT NOTICE: When the MI-11206-B Amplifier is connected for matching input, the capacitor C-9 (390 Mmfd.), which is connected across the primary of the interstage transformer T-2, must be completely removed from the circuit in order to obtain the frequency response given in the data on page 1.

The input transformer primary is balanced to ground and the mid-tap is grounded.

The input leads need not be larger than No. 19 A.W.G., should be a shielded twisted pair, insulated for 200 volts, and, in order to prevent undesirable pickup, should not be run adjacent to, or laced in with, AC or loudspeaker field supply leads.

AUDIO OUTPUT CONNECTIONS

The amplifier is usually operated into a balanced line or load of 500-600-ohms or 250 ohms, but if desired it can be connected to operate into an unbalanced line or load of 125, 62.5, or 10.5 ohms.

The amplifier is connected as it leaves the factory to operate into a balanced line or load of 500-600 ohms, and in this case the amplifier "OUTPUT" terminals will be found connected within the amplifier to the 500-600-ohm terminals of the output transformer T-3, (terminals 4A and 6B).

If it should be desired to operate into a 250-ohm line or load, the amplifier "OUTPUT" terminals must be disconnected within the amplifier from the 500-600-ohm terminals of the output transformer T-3 (terminals 4A and 6B), and connected to the 250-ohm terminals of the output transformer T-3, (terminals 4A1 and 6B1).

The output transformer secondary is balanced to ground. The mid-tap of the output transformer secondary (terminals 4B and 6A on T-3) is not grounded when the Type 83-C Amplifier

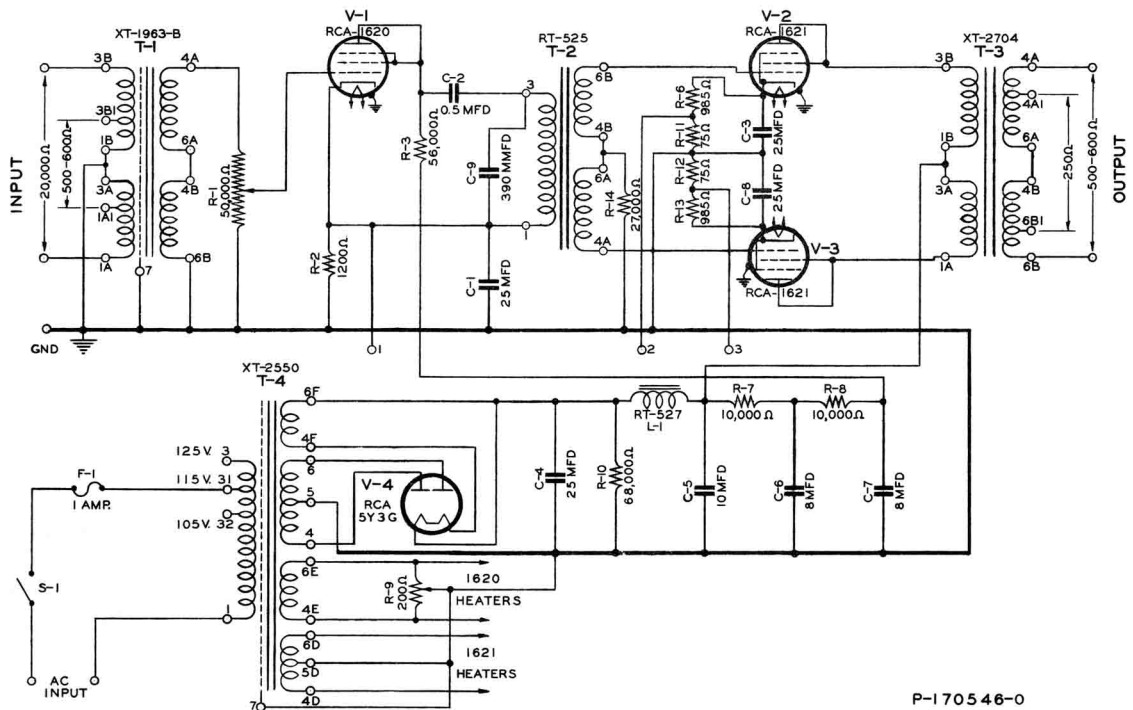


FIGURE 3 - SCHEMATIC DIAGRAM.

REPLACEMENT PARTS LIST

Insist on genuine RCA Factory-Tested parts, which are readily identified and may be purchased from Authorized Dealers.

| <u>STOCK NO.</u> | <u>DESCRIPTION</u> | <u>STOCK NO.</u> | <u>DESCRIPTION</u> |
|------------------|--|------------------|--|
| 13894 | Capacitor - 390 Mmf. (C9) | 30731 | Resistor - 1,200 Ohms, 1/2 Watt (R2) |
| 17600 | " 0.5 Mfd., 600 Volts (C2) | 3078 | " 10,000 Ohms, 1/2 Watt (R7,R8) |
| 17432 | " 8-8 Mfd., 450 Volts (C6,C7) | 30409 | " 27,000 Ohms, 1/2 Watt (R14) |
| 13224 | " 10 Mfd., 475 Volts (C5) | 30650 | " 56,000 Ohms, 1/2 Watt (R3) |
| 16727 | " 25 Mfd., 50 Volts (C1, C3, C8) | 30225 | " 68,000 Ohms, 2 Watts (R10) |
| 13036 | " 25 Mfd., 475 Volts (C4) | 12110 | Shield - Top Tube Shield |
| 17624 | Dial - Dial Plate | 33084 | Socket - 8-Contact Tube Socket |
| 14133 | Fuse - 1 Ampere (F1) | 28322 | Switch - S.P.S.T. Toggle Switch (S1) |
| 32059 | Holder - Fuse Holder | 17426 | Transformer - Input Transformer - XT-1963B (T1) |
| 17268 | Knob - Variable Resistor Knob | 17427 | Transformer - Interstage Transformer - RT-525 (T2) |
| 18953 | Potentiometer - 200 Ohms (R9) | 17567 | Transformer - Output Transformer - XT-2704 |
| 19330 | " 50,000 Ohms (R1) | 17430 | Transformer - Power Transformer - XT-2550 (T4) |
| 17429 | Reactor - RT-527 (L1) | | |
| 17606 | Resistor - 985-75-75-985 Ohms - Tapped (R6, R11, R12, R13) | | |

leaves the factory, but it may be grounded by the customer, if desired. Care must be taken in this case, however, to make certain that there are no other grounds in the input circuits of the succeeding equipment which could cause improper operation.

If it should be desired to operate the amplifier into an unbalanced line or load of 500, 250, 125, 62.5, or 10.5 ohms, this load should be connected to the amplifier "OUTPUT" terminals, and the amplifier "OUTPUT" terminals should be connected within the amplifier to the following terminals of the output transformer T-3, and none of these terminals is grounded:

| <u>LOAD (OHMS)</u> | <u>TRANSFORMER TERMINALS (T-3)</u> |
|--------------------|---|
| 500 | 4A and 6B |
| 250 | 4A1 and 6B1 |
| 125 | 4A connected to 4B, and 6A connected to 6B. <u>Remove 6A to 4B connections.</u> |
| 62.5 | 4A1 connected to 4B, and 6A connected to 6B1. <u>Remove 6A to 4B connections.</u> |
| 10.5 | 4A connected to 6B1, and 4A1 connected to 6B. <u>Remove 6A to 4B connection.</u> |

The output leads of the Type 83-C Amplifier need not be larger than #19 A.W.G., should be a shielded, twisted pair, insulated for 200 volts and should not be run adjacent to, or laced in with, AC or loudspeaker field power leads.

A C P O W E R C O N N E C T I O N S

The AC power connections are made to the amplifier through the two terminals marked "AC" The power transformer, T-4, is designed for nominal operation at 115 volts and contains taps for operation at either 105 volts or 125 volts. The transformer is connected at the factory for 115-volt operation, and this connection is satisfactory for operation from an AC line voltage of from 110 to 120 volts. If it is definitely known that the AC line voltage is from 100 to 110 volts during the operating period, the lead from the fuse to the transformer T-4 should be removed from terminal #31 and connected to the 105-volt terminal of the power transformer T-4, (terminal #32). If it is definitely known that the AC line voltage is from 120 to 130 volts during the operating period, the lead from the fuse to the transformer T-4 should be removed from terminal #31 and connected to the 125-volt terminal of the power transformer T-4, (terminal #3).

The AC power leads should be a No. 14 A.W.G., rubber covered, shielded twisted pair, insulated for 600 volts, and should not be run adjacent to, or laced in with, the audio leads.

CAUTION: As a precautionary measure, do not connect the AC power leads to the amplifier until all other wiring to the amplifier is complete.

A C P O W E R S W I T C H

A toggle switch, S-1, is provided on the amplifier base, near the RCA-5Y3-G Radiotron, so that the AC power may be controlled at the amplifier.

H U M A D J U S T M E N T

To adjust the hum potentiometer, R-9, it is necessary to disconnect the input terminals, connect a 500-ohm resistor across the 500-ohm terminals of the input transformer, T-1 (terminals 1A1 and 3B1), connect the output of the Type 83-C Amplifier to the input of another amplifier having a gain of about 60 db, connect a headset across the output terminals of the additional amplifier, turn on both amplifiers, set the volume control of the Type 83-C Amplifier at its maximum position, and adjust the hum potentiometer of the Type 83-C Amplifier (located between L-1 and T-4) to the position of minimum hum. The potentiometer may be turned over a certain arc at the center of its travel without introducing appreciable hum in the headset. Therefore, it should be turned in each direction to a position at which the hum is just noticeable and then reset at a point midway between these two positions.

B I A S M E A S U R E M E N T

The bias voltages of the Radiotrons may be measured by connecting a 20,000-ohm per volt 7½-volt DC meter (MI-11700) between the terminals marked "G", and "1", "2", or "3", on the terminal board. The bias reading provides an indication of the plate current, and therefore, an indication of the manner of operation of that tube.

When one or two Type 83-C Amplifiers are mounted on a Type 36-A or 36-B Panel and Shelf, a convenient and permanent arrangement is to bring leads from the terminals "G", "1", "2", and "3", to a selector switch mounted on the panel of the Type 36-A or 36-B Panel and Shelf. The DC Meter may be mounted at any convenient location. This arrangement provides a ready means of checking the bias voltages. Separate selector switches are available, listed as RCA MI-11701.

CAUTION: The leads connecting the external volt-meter to measure bias voltages should be shielded, otherwise there is possibility of these leads picking up hum or noise voltage and introducing it on the cathode of the first tube when that tube is being checked.

| <u>RADIOTRON</u> | <u>TERMINALS</u> | <u>VOLTAGE</u> |
|------------------|------------------|----------------|
| RCA-1620 | "G" and "1" | 2.8 |
| RCA-1621 (#1) | "G" and "2" | 1.8 |
| RCA-1621 (#2) | "G" and "3" | 1.8 |

O P E R A T I N G V O L T A G E S A N D C U R R E N T S

The total rectified voltage (across R-11) is approximately 308 volts. The actual operating voltages and currents for each Radiotron are given in the following tabulation for conditions of a 115-volt line, with the power transformer T-4 115-volt tap connected, measured with a 20,000-ohm per volt meter. Measured values will deviate from these figures in relation to the internal resistance of the measuring instruments. All voltages except heater voltages should be measured to ground in order to correspond with these figures.

| | <u>RCA-1620</u> | <u>RCA-1621</u> | <u>RCA-5Y3-G</u> |
|---------------------------|-----------------|-----------------|------------------|
| E _f (AC volts) | 6.3 | 6.3 (Each) | 5.0 |
| I _p (DC Ma.) | 2.5 | 46 (Two Tubes) | 55 |
| E _p (DC Volts) | 100 | 267 (Each) | -- |

R C A V I C T O R D I V I S I O N

R C A M A N U F A C T U R I N G C O M P A N Y, I N C.

Camden, N. J. U. S. A.

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