

MODEL DB-20, Late

MODEL DB-20 Batt.

RADIO MFG. ENGINEERS, INC.

Alignment, Trimmers

Voltage

The RME DB-20 Presselector is a compact efficient design of a straightforward radio frequency amplifier cascade with a specified input and output impedance. The input impedance is of a low value varying between 200 and 350 ohms over the frequency range covered by the tuning elements of the instrument. The output impedance varies over the same range in the same manner so that the insertion of this amplifier between the antenna and the RME-69 receiver incurs no mismatch in the coupling system and provides an increase in selectivity and gain due to its insertion.

The adjustment of the amplifier is calibrated on a scale in as close a manner as it is possible to calibrate such an instrument and tuning of the instrument should be done so that the setting of the indicator on the DB-20 scale is very close to the frequency being used. One check on this method is to set the tuning control of the amplifier to a position which gives a maximum meter reading on a given signal when used in conjunction with the RME-69 or any other receiver having a tuning indicator. In the absence of the tuning indicator background noise or signal strength may be used as an indication of optimum setting of the preamplifier and this will compensate for small variations which are bound to occur in the calibration of the instrument.

One side of the output circuit of the DB-20 is grounded and it is essential that the proper wire of the output cable be connected to the antenna terminal of the receiver with which it is used in order to provide proper operation for the combination. The high side or the ungrounded lead of the output cable is marked with a red tracer and this should be normally connected to the antenna terminal which would be used in the connection of a Marconi Antenna against ground in normal receiver operation without the DB-20. On the RME-69 receiver this is the outside terminal of the three-terminal input strip marked A - A - G. The other lead, which is a plain black wire, is to be connected to the middle antenna terminal and a ground jumper can be used to connect, A (center) to G on the terminal strip. In the case of a receiver being used with the DB-20 which has only a two-terminal input, that is antenna and ground, the black wire connects, of course, to the ground and the red tracer wire to the antenna terminal. A reversal of these leads will cause inefficient operation and probably no operation at all even when the antenna switch is thrown so that the antenna is connected directly to the receiver. This can be a source of trouble when poor operation is experienced.

A change-over switch is provided and consists merely of a four pole double throw switch indicated in Fig. 1 so that when it is thrown to the left the antenna is connected to the DB-20 and the DB-20 connected to the receiver input terminal. When the switch is thrown to the right the antenna is connected directly to the receiver and the DB-20 circuits are entirely removed from the picture.

PROCEDURE FOR ALIGNMENT OF THE RADIO FREQUENCY CIRCUIT

As an indicating device for alignment changes the meter on the RME-69 receiver can be used to indicate maximum signal being supplied the receiver from the DB-20. In the case of other communication receivers the same method may be used with their respective carrier level or R meter indication. In case the alignment is made with a receiver without carrier indicating devices an output meter can be used in the regular manner in which it is used for the alignment of receivers, but in this case, of course, it will be necessary to use a modulated signal input to the DB-20 to supply an audio component which can be used to operate the output meter.

All adjustments described should be adjusted to and left set at maximum meter readings be it carrier amplitude indicator or output as indicated on the output meter.

First set the receiver to 1000 Kc. and tune the DB-20 to 1000 Kc. which will be indicated on the main tuning dial and the band in which will be found 1000 Kc. is provided by setting the switch to position one (1). Set the pointer of the DB-20 on 1 Mc. reading of the scale and supply 1 Mc. signal input to the antenna terminal to the DB-20 setting the selector switch on the DB-20 (Fig. 1) to the left position. When in this position adjust C₁, C₂ and C₃ for maximum meter reading.

Then switch to band two and three successively and check the setting at 2, 3, 4 and 5 megacycles. These frequencies, of course, will be checked by placing the band switch in the proper position required for tuning to these frequencies. The receiver, of course, must also be adjusted to these frequencies simultaneously with the DB-20.

The calibration for these frequencies will be found to be dependent on the settings of C₁, C₂ and C₃ which are made for 1000 Kc. on band one and will be in adjustment if band one is properly aligned.

Next turn the switch to position four and feed a signal of 7 Mc. into the receiver and adjust the tuning control of the DB-20 so that it sets on 7 Mc. Under these conditions check the setting of C₄ for peak output. (Fig. 2).

Next set the band switch on position five and insert a signal of 14 Mc. into the receiver adjusting the tuning control of the DB-20 to 14 Mc. under these conditions adjust C₅ and C₆ for maximum output.

Next set the band switch to position six and set the tuning indicator to 30 Mc. on the scale and insert a signal of 30 Mc. into the DB-20. This condition obtained adjust C₇, C₈ and C₉ for maximum output.

During all of these settings and adjustments, of course, the receiver should be set to the same frequency as the DB-20 so that it will be able to receive the output of the DB-20 at the proper frequency.

The adjustments just described will assure maximum output due to alignment of the RF circuit in the DB-20.

The voltages to be expected at points indicated on the schematic diagram of Figure 13 are as follows:

- 1 to ground (volume control set to minimum) 86.6 volts.
- 1 to ground (volume control set to maximum) 3.4 volts.
- 2 to ground 285 volts
- 3 to ground 100 volts
- 4 to ground 3.4 volts
- 5 to ground 333 volts
- 6 to ground 846 volts
- 7 to ground 183 volts
- 8 to ground 333 volts
- 9 to ground 360 volts

A to A 6.6 volts at 115 volts line voltage AC

The following continuity checks should be made:

	Band (1)	Band (2)	Band (3)	Band (4)	Band (5)	Band (6)
11 to ground	3.8	1.4	0.6	0.2	0.2	0.2 (ohms)
12 to 13	0.2	0.2	0.2	0.2	0.2	0.2 (ohms)
14 to 15	0.2	0.2	0.2	0.2	0.2	0.2 (ohms)
16 to ground	3.8	1.4	0.6	0.2	0.2	0.2 (ohms)
17 to ground	3.8	1.4	0.6	0.2	0.2	0.2 (ohms)

All measurements made with output cable and antenna disconnected and changeover switch in DB-20 position.

Voltages greater or smaller than these values listed by an amount exceeding 15% indicates difficulty in the power circuits of the receiver.

Resistances greater or less by 15% than the resistances listed indicates conditions other than normal in continuity in these circuits.

If the amplifier is dead as evidenced by a loss in signal strength on a given signal when the DB-20 is out into the circuit the loss being compared with the signal received when the antenna is connected directly to the receiver may be due to a dead tube which is usually due to the fact that the filament is burned and can be ascertained by placing the hand on the tube to see whether or not it is warm or cold. If it is warm, of course, the filament is lit and probably the tube is satisfactory. If the tube is cold the filament is probably open and therefore the tube needs replacing. Of course, tubes can be defective from other reasons which can not be detected in this manner but must be ascertained by checking on a regular tube checker.

Another reason for a dead amplifier may be due to lack of voltage on elements of the tube and can be checked by the voltage check.

Cause of no voltage on the plate or screen of the tube can be due to short circuit in the by-passes of C₇, C₂, C₄, C₈, C₁₀ or C₁ or an open resistor R₆, R₂, R₃ or an open choke T₂ or a burned out 80 rectifier tube or an open circuit in the antenna coil or the output coils of the DB-20 which can be checked by the continuity measurements listed above.

If the amplifier has very little gain (the average gain should be 38's over that of the receiver itself) it is probably due to misalignment and can be corrected by the procedure described on page 2 and 3, or there is a defective tube which is not providing all the gain that is standard and the tubes can be checked and replaced by tubes having suitable characteristics.

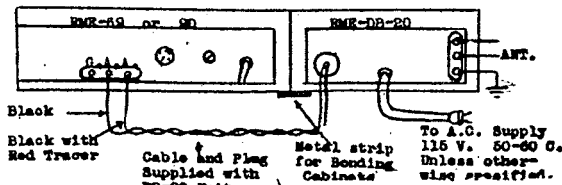
Additional information regarding special cases of trouble can be obtained from the Radio Mfg. Engineers by listing the details in a letter and writing direct to the factory.

METHOD OF CONNECTION OF THE DB-20 WITH THE RME-69 RECEIVER

The DB-20 unit is housed in a furniture steel crinkle finished cabinet which matches the height and appearance of the cabinet used to house the RME-69 receiver. It is designed to be placed at the left side of the receiver. Figure 1, Sheet 2, shows a sketch of the rear view of the DB-20 placed alongside of the receiver. In order to make sure that the two cabinets are well bonded together, it is advisable to make sure that all paint is cleaned from the adjacent cabinet bottom edges, and the two placed close together on a clean surface copper strip about three inches by ten inches long, or aluminum, or any metal of a non-ferrous kind with a clean surface.

The main factor to consider is that the two cabinets are properly connected to this ground. This prevents the possibility of any feedback due to the antenna of the DB-20 getting close to the output wires of the DB-20 and causing oscillation and also reduces the effect of signal leakage direct to the receiver due to the fact that the units are at a high impedance above ground. When this location and placement of the two units has been achieved, the connections can be made as indicated in Figure 1. The cable and plug indicated in the diagram are furnished with the DB-20 unit. This twisted pair will be found one black wire and one black wire with red tracer. The black wire with the red tracer should be placed as indicated on the outside antenna post of the RME-69 Receiver. The black wire can be placed on the other antenna post and the ground should be connected to any good ground available. If it is certain that the bond is good, the ground as indicated on the DB-20 will be sufficient for the entire system.

Fig. 1



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MODEL DB-20, Late
 MODEL DB-20 Batt.
 Trimmers; Chassis
 Parts List

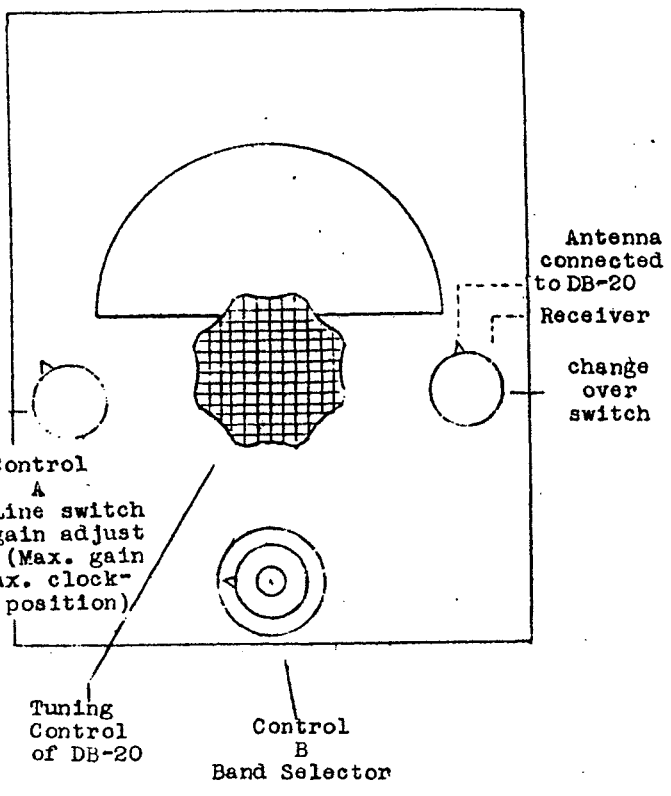
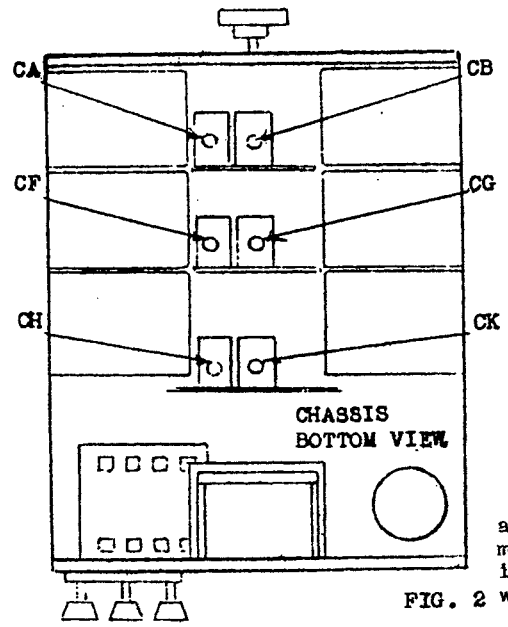


FIG. 2

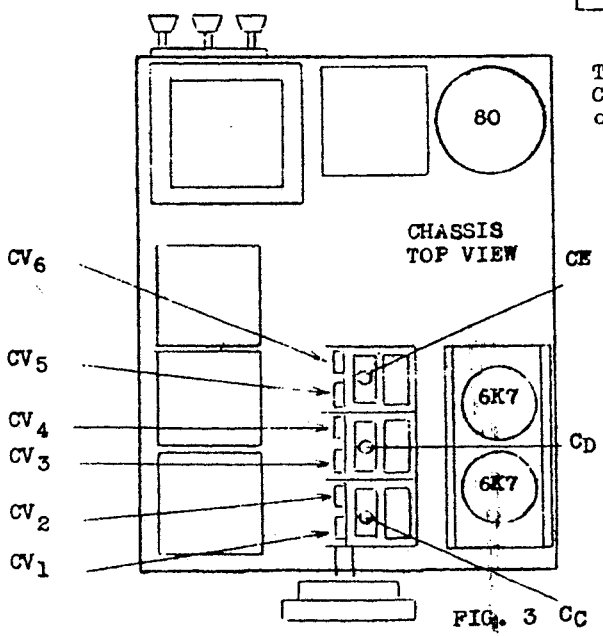


FIG. 3

BATTERY OPERATED DB-20 PARTS LIST

RESISTORS

- 1.1.....300 ohm
- 1.2..10,000 ohm
- 1.3..10,000 ohm
- 1.4..30,000 ohm variable
- 1.5.....300 ohm
- 1.6..10,000 ohm
- 1.7..50,000 ohm 1 watt

CONDENSERS

- 2.1..... .01
- 2.2..... .01
- 2.3..... .0001
- 2.4..... .01
- 2.5..... .01
- 2.6..... .01
- 2.7..... .01

- CA 5 - 30 μ fd Adj. padder
- CB 5 - 30 μ fd Adj. padder
- CC Variable condenser trimmers
- CD Variable condenser trimmers
- CE Variable condenser trimmers
- CF 5 - 30 μ fd Adj. padder
- CG 5 - 30 μ fd Adj. padder
- CH 5 - 30 μ fd Adj. padder
- CK 5 - 30 μ fd Adj. padder

PARTS LIST FOR DB-20

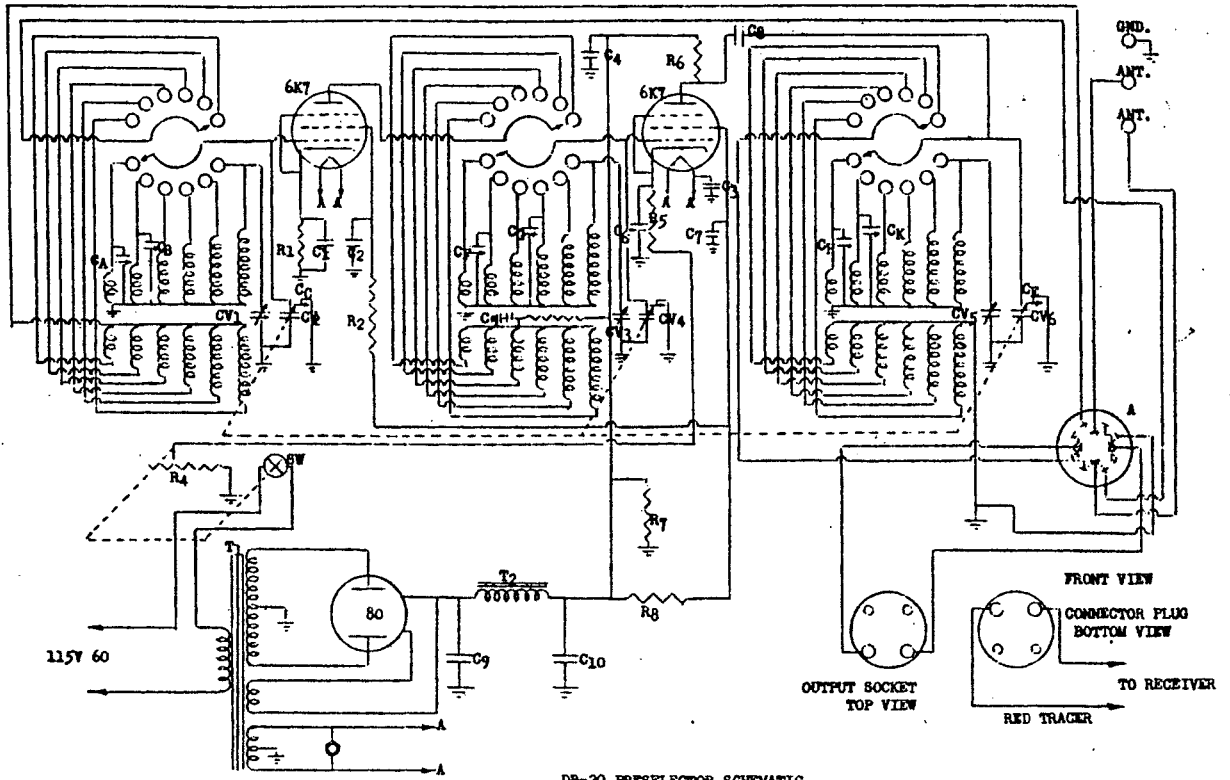
- R1 300 ohm
- R2 10,000 ohm
- R3 10,000 ohm
- R4 30,000 ohm variable
- R5 300 ohm
- R6 10,000 ohm
- R7 15,000 ohm 10 watt
- R8 50,000 ohm 1 watt
- C1 .01
- C2 .01
- C3 .002
- C4 .01
- C5 .01
- C6 .01
- C7 .01
- C8 .0001
- C9 8 μ fd.
- C10 12 μ fd.
- T1 Power transformer
- T2 Filter choke
- Ca 5 - 30 μ fd adj. padder
- Cb 5 - 50 μ fd adj. padder
- Cf 5 - 30 μ fd adj. padder
- Cg 5 - 30 μ fd adj. padder
- Ch 5 - 30 μ fd adj. padder
- Ck 5 - 50 μ fd adj. padder
- Cv1-6 Variable tuning condenser
- Cc, Cd, Ce Variable condenser trimmers

SWITCHES

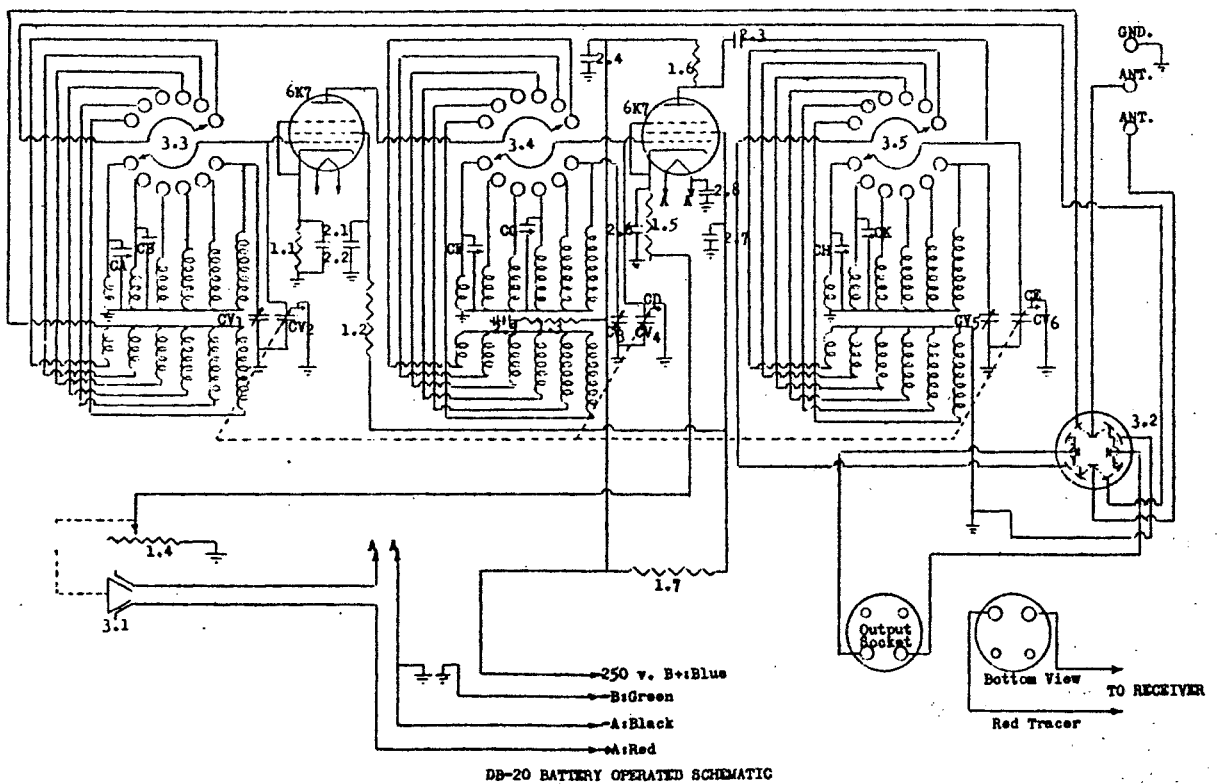
- 3.1 Line switch
- 3.2 antenna changeover switch
- 3.3 Band switch section
- 3.4 Band switch section
- 3.5 Band switch section

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MODEL DB-20, Late
 MODEL DB-20 Batt.
 Schematics



DB-20 PRESELECTOR SCHEMATIC

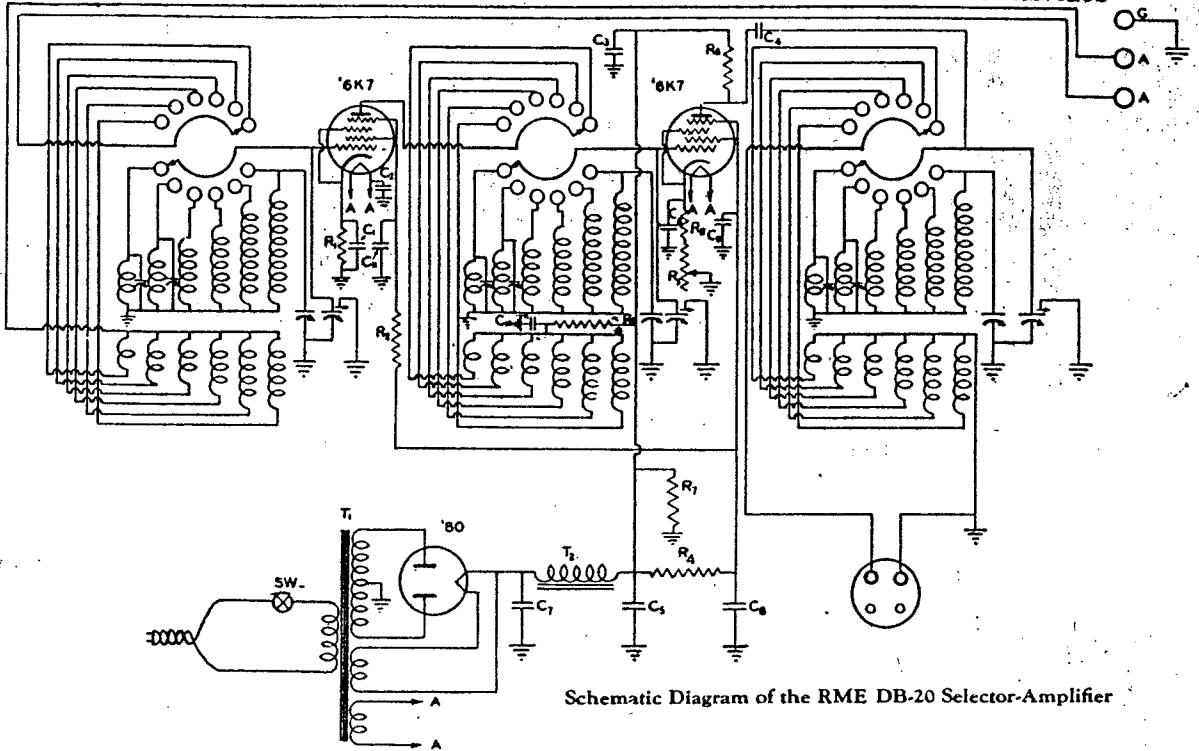


DB-20 BATTERY OPERATED SCHEMATIC

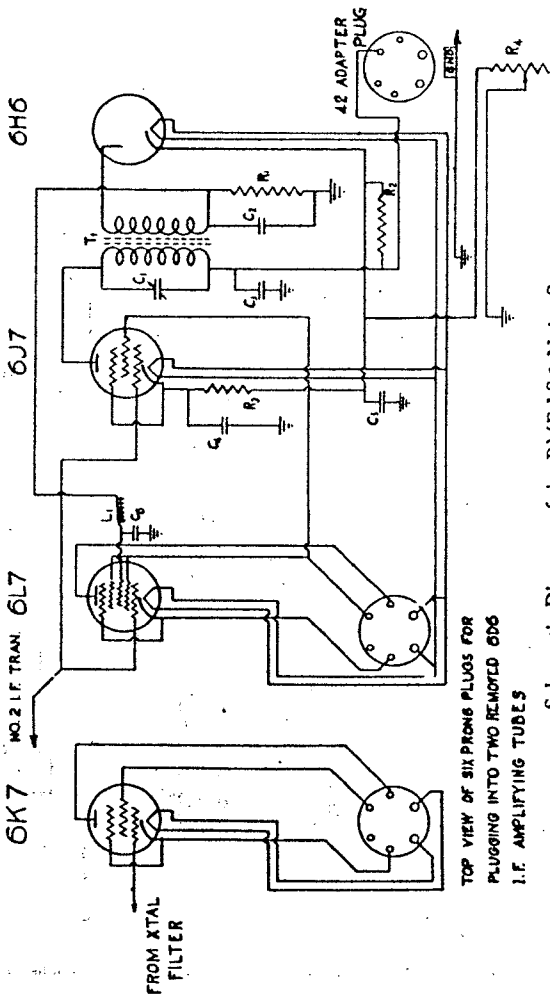
MODEL RME DB-20
Amplifier Schematic

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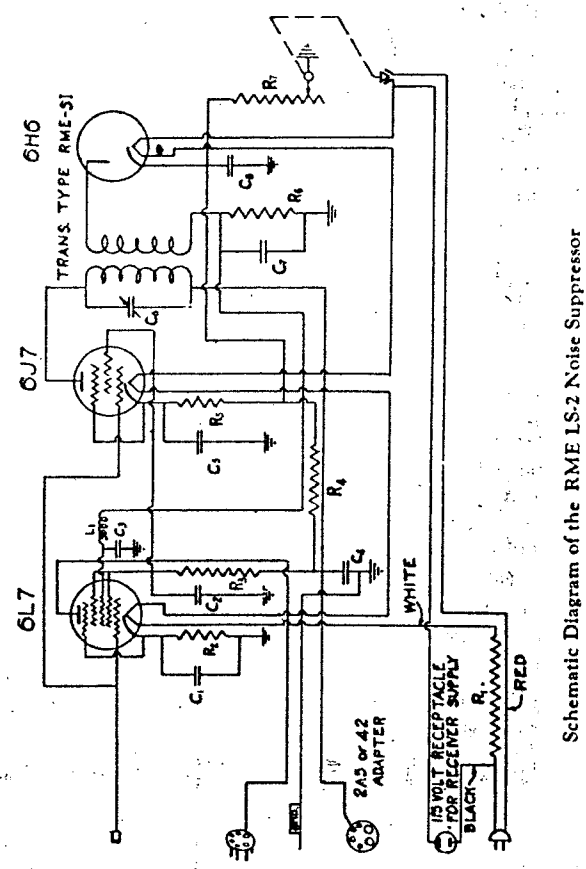
MODEL RME LS-1
MODEL RME LS-2
Noise Suppressors
Schematics



Schematic Diagram of the RME DB-20 Selector-Amplifier



Schematic Diagram of the RME LS-1 Noise Suppressor



Schematic Diagram of the RME LS-2 Noise Suppressor