

RECORDER-AMPLIFIER

? Please print a diagram of a 30-watt amplifier for recording and playback. I have a high-fidelity output transformer with a plate-to-plate load impedance of 6,600 ohms for 6L6's, a 30-watt hi-fi speaker with built-in 500-ohm output transformer, and a 4-ohm magnetic cutter.—A.R., Huntington, W. V.

A. Here is a recorder amplifier designed to your specifications. The sound can be monitored with phones and recording level checked with the 6U5 electron-ray indicator. A 5-pole, 4-position switch alters the input and output circuits for the various operations. Separate pickup and turntable are needed when making recordings from a record.

Place the major components on the chassis so that the power-supply section is as far as possible from the input circuits. Shield all plate and grid leads up to the input grid of the 6N7 and keep them as short as possible. Use shielded cable and plugs.

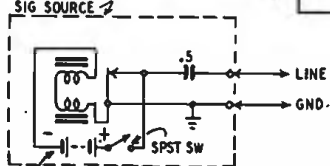
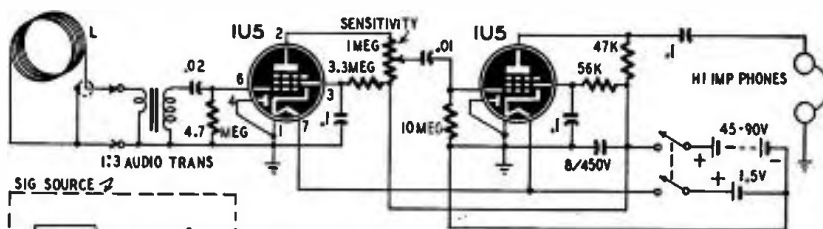
MATERIALS FOR RECORDER-AMPLIFIER

Resistors: 2—4.7, 1—3, 2—2.2, 7—1 megohm, 1/2 watt; 3—470,000, 2—330,000, 2—270,000, 2—100,000, 2—56,000, 3—27,000, 1—15,000, 1—1,500, 1—560 ohms, 1/2 watt; 1—50,000, 1—500 ohms, 50 watts; 1—250 ohms, 10 watts; 1—5,600 ohms, 4 watts; 1—12,000, 1—4,700 ohms, 2 watts; 7—500,000-ohm potentiometers.
Capacitors: 1—.0005, 1—.006- μ f, 450-volt mica; 2—.025, 7—.01, 2—.006, 1—.05- μ f, 600-volt paper; 2—.01- μ f, 400-volt paper; 3—10, 1—40- μ f, 450-volt electrolytic; 3—10- μ f, 500-volt electrolytic; 1—50, 1—25- μ f, 25-volt electrolytic.
Transformers: 1—output, high-fidelity, 6,600 ohms plate-to-plate, 30-watts, multi-tap secondary; 1—power, 780 volts center-tapped at 150 ma or more, 5 volts, 3 amperes, 6.3 volts, 5 amperes; 2—chokes, 7 H, 150 ma or more.
Tubes: 2—6L6, 1—6N7, 2—6SK7, 1—6SN7, 1—5U4-G, 1—6U5/6G5.
Miscellaneous: 1—chassis about 10 x 17 x 3 inches, 7—octal, sockets; 1—tuning-indicator assembly; 1—recorder assembly with magnetic cutter and xtal pickup; 2—s.p.s.f. toggle, 5—circuit, 4-position rotary switches; 1—1N34 crystal diode; 3—shielded microphone connectors; assorted hardware.

FAULTY CIRCUIT LOCATOR

? I need a locator for grounded and shorted wires in conduits. The equip-

capacitor of such value that the circuit will resonate at the oscillator frequency.



ment must be battery-operated and must be able to locate faulty points without any necessity for opening the conduits.—R. L. A., San Leandro, Calif.

A. A suitable fault locator appears in the diagram. The buzzer signal (a 400- to 1,000-cycle audio oscillator tone can be used, if desired) is fed into the line under test. The pickup coil L is held close to the conduit and moved along it, the coil picking up the signal from the line by induction. When there is a break or a short in the wires at any point reached by the coil, the operator will no longer hear the signal.

The exploring coil is wound with 200 turns of No. 36 s.c.c. wire, taped so that they will not fall apart. Make the winding about 12 inches in diameter, and fasten it to handle made of a light stick.

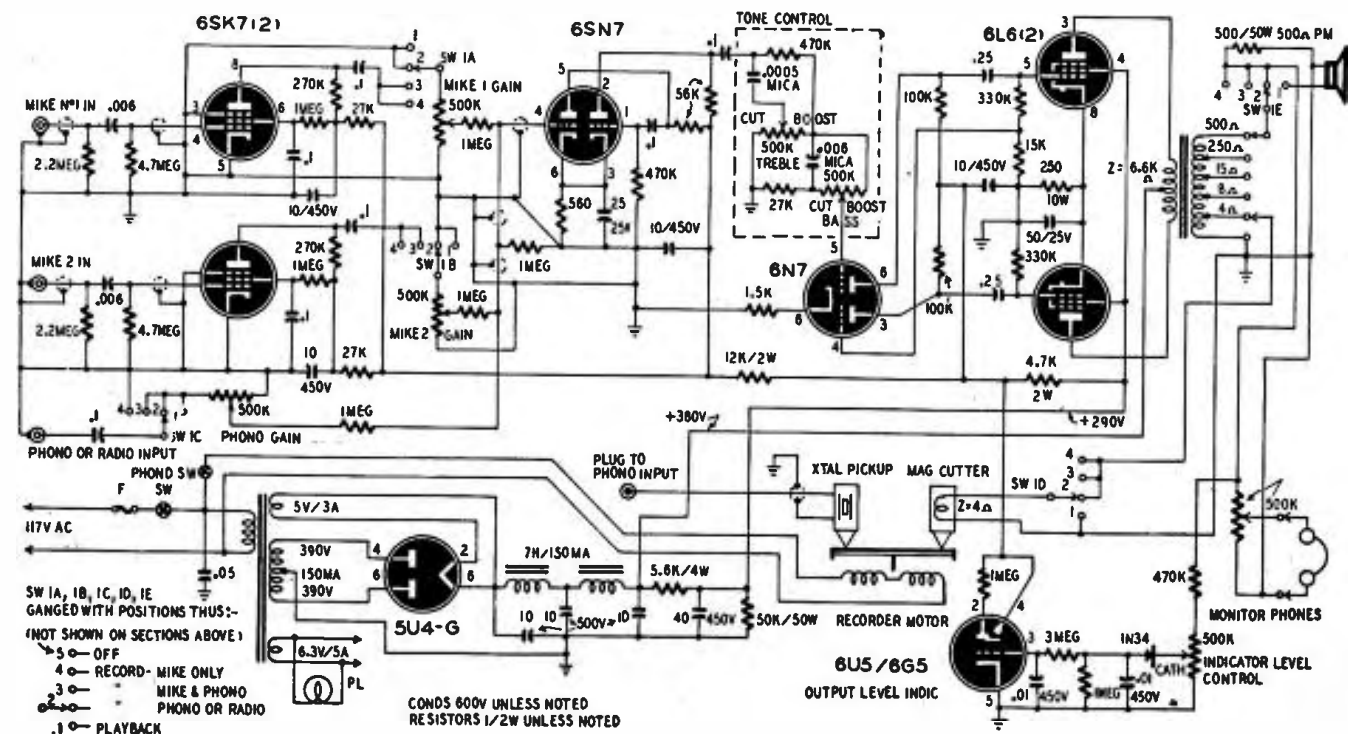
For greater sensitivity when an oscillator is used, the secondary of the input transformer may be shunted with a

6-VOLT SUPPLY

? I have two magnesium-cupric sulphide bridge rectifiers that will deliver 7.5 volts at 20 amperes into an inductive load from an a.c. input of 19.8 volts. Can I use these to make a supply to deliver 6.6 volts at 30 amperes? If so, what voltage should be supplied by the transformer and how is this computed?—A.P.P., Lima, Ohio.

A. Since each of the rectifier units you have will deliver only 20 amperes, it is necessary that you connect them in parallel, it is recommended that they be operated from separate transformers and their outputs connected in parallel as shown in Fig. 1. With this circuit you can draw up to 40 amperes from the supply. If you do not care to use the two transformers, then use the circuit in Fig. 2 or 3.

Most manufacturers specify that the current rating of the individual rectifiers be reduced to 75% of the maximum rating when used in these circuits.



To determine the correct a.c. input voltage for your rectifier units, subtract the difference between the *rated output voltage* and *desired output* from the *rated a.c. input voltage*. The resultant is the a.c. voltage to be applied to develop the desired d.c. output voltage. For example:

$$19.8 - (7.5 - 6.6) = 19.8 - 0.9 = 18.9 \text{ volts a.c.}$$

A transformer delivering 18.9 volts with the current ratings necessary for either circuit will probably have to be made on special order, but you can im-

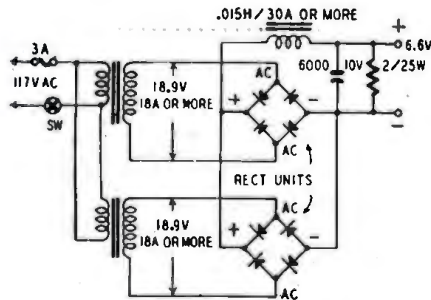


Fig. 1—Paralleled outputs supply 40 amperes.

prove by using a number of high-current 6.3-volt filament transformers in series parallel to deliver the required voltage and current. Three of these transformers with their secondaries in series aiding and primaries in parallel will deliver 18.9 volts. Connect enough of these series strings in parallel to deliver the current you want.

It will be worth while to use a heavy series resistor or an auto-transformer in the a.c. line to control the voltage. You should put an a.c. voltmeter across

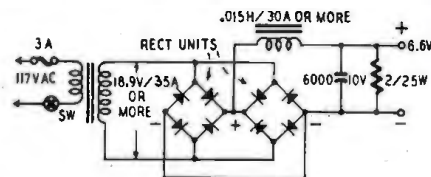


Fig. 2—Rectifier has single input and output.

the input terminals of the rectifier and make sure that the no-load a.c.-input to the rectifier units does not exceed manufacturer's specifications, or damage is likely to result.

If you would like a supply to deliver 6.6 volts to separate 15-ampere loads, then use the circuit in Fig. 3. Each set

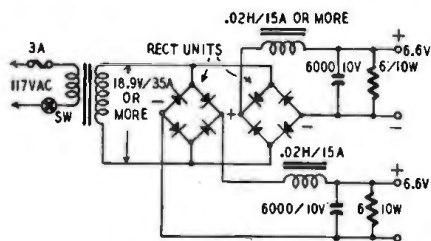


Fig. 3—This circuit has two separate outputs.

of terminals will deliver up to 15 amperes when used alone. Connect them in parallel for 30 amperes maximum output. The outputs can be connected in series to deliver 13.2 volts at a maximum of 15 amperes.

APRIL, 1949



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