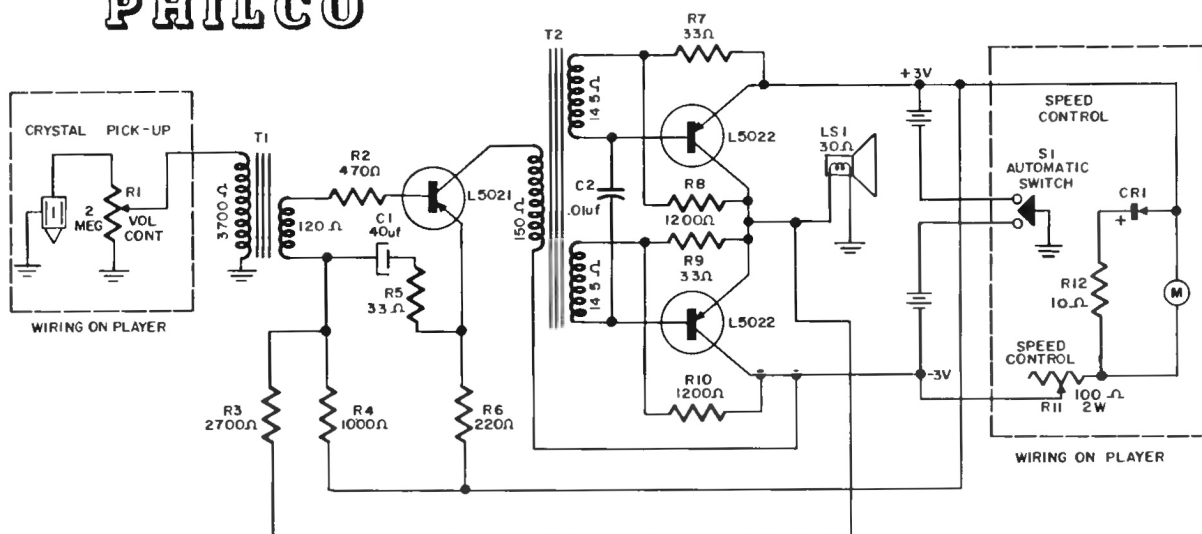


PHILCO

MODELS TPA-1, TPA-2



CIRCUIT DESCRIPTION

The circuit consists of a transistor amplifier stage feeding two transistors in a push-pull class B output stage. The printed wiring panel serves as the chassis.

The transistors employed in this amplifier are alloy-junction types L5021 and L5022. The alloy or fused-junction type is used in view of the power requirements necessary to drive the speaker. The speaker voice coil, of 30 ohms dc resistance, is the output load. Transformer coupling is employed between stages. The three transistors are base fed in a common emitter circuit.

The M-32 and M-32A, 45 RPM, record players incorporate a 4.0 volt, dc motor in rim drive, a crystal pickup cartridge and an automatic on-off switch.

The switch operates as follows: Normally, the motor and amplifier are off when the tone arm is in the rest post. The unit is turned on by lifting the tone arm clear of the rest post and swinging out or away from the turntable. This turn on is accomplished by the wire, mounted on the trip plate assembly, pushing the stud, part of the toggle plate assy. between the leaves of the trip switch, thus completing the circuit. This stud remains in the trip switch until the record is completed. As the tone arm moves inward in the record's trip groove, the long ear of the trip plate assembly disengages the toggle plate stud from the switch thus turning the unit off. The tone arm may now be picked up and returned to the rest post with the set remaining off. This switching method is designed to conserve battery life as the unit is only on during the actual playing of a record. This is possible only because the transistors require no warm-up.

The output of the crystal pickup is coupled to the input stage by a step-down transformer. This matches the high crystal impedance with the relatively low input impedance of the L5021 transistor.

SERVICING TRANSISTOR PRINTED PANEL

1. Turn the unit on and, with a stroboscope on the turntable, adjust the speed control for 45 rpm. If proper turntable speed can be maintained, there is sufficient voltage (4.0 volts) for amplifier operation with but a slight decrease in power output.
2. Using a test record, of known characteristics, check the wave form appearing across the volume control (R1) for both voltage and signal quality.
3. Place oscilloscope leads across secondary of input transformer (T1) and check voltage and quality of signal.
4. Check speaker (LS1) for open voice coil or other troubles.
5. If trouble is still present, check signal wave form across primary of interstage transformer (T2). If trouble is indicated replace L5021 transistor.
6. Check signal across each secondary winding of T2. Poor or missing wave form at either secondary indicates a faulty interstage transformer.
7. Connect oscilloscope across the speaker voice coil, check wave form and replace the L5022 output transistors one at a time.

MODEL TPA-2

Tone arm Adjustments

1. The tone arm stanchion should be so located that the needle will *Set Down* at $1\frac{5}{8}'' \pm 1/32''$ radius from turntable center for the arms innermost position.
2. *Needle Pressure* should be between 8 and 10 grams when the arm is parallel. To adjust, bend the vertical member of the support assembly, (the rear anchor of the needle pressure spring). Forward, to relax the needle pressure spring, will increase needle pressure. Toward the rear, to increase the spring tension, will decrease the needle pressure.
3. *Horizontal tone arm friction* should not be more than $1\frac{1}{2}$ grams at any point throughout its excursion.
4. *Vertical tone arm friction* should not exceed $1\frac{1}{2}$ grams. Vertical friction is measured as follows: Raise front end of tone arm with gram scale so that needle point is approx. $\frac{3}{4}''$ above the mounting plate. Take the reading. Then lower the tone arm $3/16''$ and again take a reading. One half of the difference of these readings is the vertical friction.
5. The pivot points of the hinge pin in the tone arm shell should be *lubricated* with a drop of oil, SAE 20. The bearing surface between the tone arm stanchion and the support assembly should have a light coating of motor cup grease.
6. The crystal cartridge leads must not interfere with the needle pressure spring nor the free vertical and horizontal movement of the tone arm.
7. Crystal sensitivity, measured across a 1 megohm load with a VTVM, shall be at least 1.5 volts RMS at 1000 cycles with needle tracking outside grooves of a standard 45 rpm test record.

