

The TA-377A is an outstanding example of a high quality preamplifier for music and sound reproduction. It uses all FET transistors in a fully complementary and symmetrical circuit to achieve truly superior performance.

The circuit features a passive RIAA phono equalization circuit instead of the more common feedback type circuit. The power supply regulators provide super low output impedance. These features plus a superior circuit design result in a preamplifier which can truly be a suitable companion to the most prestigious power amplifiers. It is especially recommended to be used with the Mark V Electronics model TA-477 FET power amplifier.

SPECIFICATIONS

Specification

TOTAL HARMONIC DISTORTION

OVERALL (FROM AUX) less than 0.007% at or below rated output level.

INTERMODULATION DISTORTION

(70Hz : 7,000Hz = 4:1 SMPTE method)

OVERALL (FROM AUX) less than 0.005% at or below rated output level.

FREQUENCY RESPONSE (at rated output)

OVERALL (AUX to PRE OUTPUT)

10 to 100,000Hz + 0.5dB-1dB

RIAA CURVE DEVIATION (PHONO)

+0.2dB, -0.2dB (30 to 15,000Hz)

CHANNEL SEPARATION (at rated output 1,000Hz)

PHONO better than 70dB

AUX better than 70dB

HUM AND NOISE (IHF)

PHONO better than 70dB

AUX better than 90dB

INPUT SENSITIVITY AND IMPEDANCE

(1,000Hz for rated output)

PHONO 47K ohms. 2mV

OUTPUT LEVEL

RATED OUTPUT (0.01% Total Harmonic Distortion)

PREAMPLIFIER OUTPUT 1.5V

RECORDING OUTPUT 150 mV

MAXIMUM OUTPUT

PREAMPLIFIER OUTPUT 15V

(0.1% Total Harmonic Distortion)

SEMICONDUCTORS 18 Transistor; 40 FETS; 12 Diodes;

POWER REQUIREMENTS

POWER VOLTAGE AC 30V x 2 400mA

POWER CONSUMPTION 12W

THEORY OF OPERATION

The TA-377A pre-amplifier takes advantage of a superior circuit topology to provide truly outstanding sound reproduction. Three complementary symmetry differential amplifiers using matched FET pairs are the heart of the amplifier. Phone equalization uses a passive inter-stage network which is generally regarded as the best method for low distortion across the entire audio bandwidth.

The power supply uses an elaborate combination of series and shunt regulation transistors. Output impedance is extremely low as a result and this contributes to the transient performance of the pre-amplifier.

Upon the application of operating power, a timing capacitor slowly charges through diode D7. After a few seconds, the capacitor voltage increases to a value sufficient to turn on the darlington transistor pair Q57 and Q58. The transistor conducts current and energizes the relay. The relay contacts connect the output of the pre-amplifier to the power amplifier with which it is used. In this way, turn on thumps are prevented from reaching the loudspeaker.

Each differential amplifier stage has a variable resistor adjustment in order to DC balance the circuit. This refinement aids in the low distortion operation of the circuit.

The schematic diagram shows a typical input source switch select circuit using a rotary 2-pole relay. The right channel is wired identically as is shown for the left channel. A dual gang volume and a dual gang balance control are also shown. The schematic will assist you in supplying and wiring these components to a set of input jacks so that the pre-amplifier may serve as the central control point in your system.

ASSEMBLY

- 1 It is highly recommended that construction proceed in two steps. The power supply portion is built first and tested before constructing the remaining portion of the amplifier. This is in order to prevent possible damage to the FET transistors when power is first turned on. Read instructions through before starting.
- 2 Insert all resistors into the printed circuit board, solder and trim excess lead length. It is strongly suggested that all resistors be inserted before soldering. It is also suggested that each resistor be tested with an ohmmeter for the proper value before being inserted into the board. By following this procedure, the possibility of inserting the wrong resistor is greatly diminished.
- 3 Using scrap pieces of wire, install the four jumpers marked 'J' on the board.
- 4 Install the four rectifier diodes 1N4001-4, D8, D9, D10 and D11. The cathode or negative end is marked with a colored band.
- 5 Install the seven 1N4148 diodes D1 through D7. The cathode or negative end is marked with a colored band.
- 6 Install all capacitors. The electrolytic capacitors are polarized. Observe the polarity markings on the capacitors and on the board.
- 7 Install the relay RL1.
- 8 Install the LED indicator D12 located near the relay. If you intend to install the finished preamplifier in a metal housing you may wish to install the LED indicator on the panel. If this is the case, temporarily install the LED now. The long lead is the anode or positive lead.
- 9 Install the four TO-220 style power transistors onto the four heatsinks. Use a thin layer of silicon transistor mounting heat compound between the transistor metal tab and the heatsink. Fasten with the hardware provided. Bend the leads as necessary to install onto the board. Attach the heatsink to the board and then solder the leads. These are transistors Q37, Q38, Q51 and Q52.
- 10 Install the remaining Regulator and Delay Unit transistors Q41 through Q58. At this time do not install any other transistors. Check the type number of each transistor as called out in the parts list. Take care to install them correctly into the board. The leads may be bent slightly so that the transistor fits easily into the holes drilled in the board. Orient the transistors as indicated by the outlines printed on the board.
- 11 Install all of the brass terminal posts. These install from the bottom up.
- 12 Install all of the variable resistors on the board.

At this point, the power supply circuit should be tested before continuing with assembly.

Connect a transformer to the 30V terminals (AC input) located at the edge of the board. The transformer should have a secondary voltage of 30 volts AC each side of center tap. Connect the center tap lead to the 0 terminal.

Make a check of the completed work and verify that there are no solder shorts on the board and that all components are installed correctly. Adjust all variable controls to half position.

Apply power. The LED indicator will come on in a few seconds. Connect a DC multimeter to the TP 1 jumper and ground. Adjust VR7 for a reading of 30 VDC.

Connect the meter to the TP 2 jumper and ground. Adjust VR8 for a reading of -30 VDC.

If there is difficulty in adjusting for these values, change the 27 K resistor marked with a * to 22 K. These resistors are located near the Q37 and Q38 heatsinks.

When the adjustments are complete, proceed with assembly of the remaining part of the preamplifier.

- 13 Install the remaining transistors taking care to get the correct transistor in the right location and oriented correctly as indicated by the outline printed on the board.

This completes assembly of the preamplifier. Proceed with adjustment of the variable resistors.

TEST

Connect a DC voltmeter to test point 3 and adjust VR1 for a meter reading below .1 volt DC, preferably 0 volts.

Connect the meter to test point 4 and adjust VR4 as above.

Connect the meter to test point 5 and adjust VR2 as above.

Connect the meter to test point 6 and adjust VR5 as above.

Connect the meter to test point 7 and adjust VR3 as above.

Connect the meter to test point 8 and adjust VR6 as above

This completes the adjustment of the preamplifier.

USE

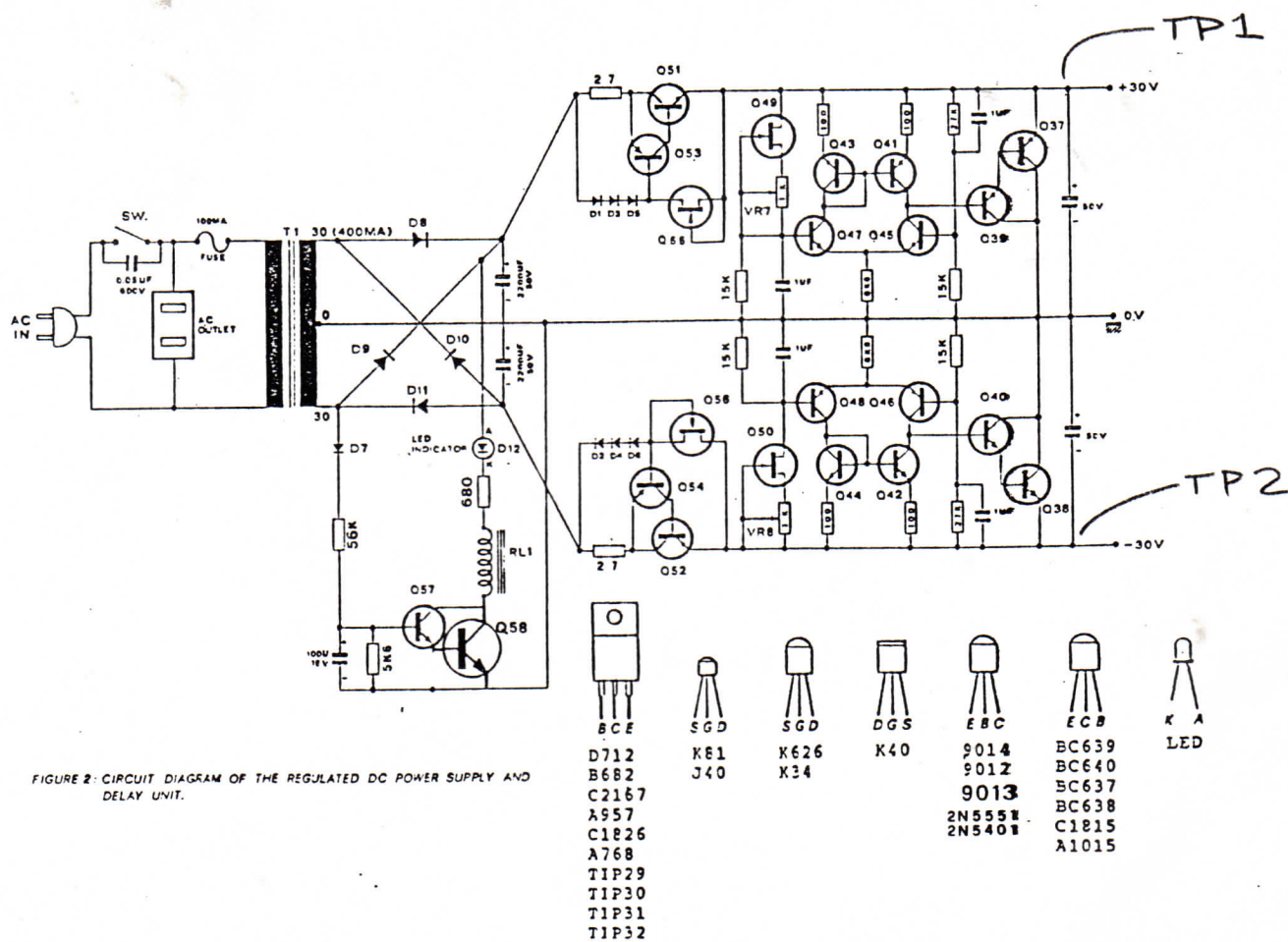
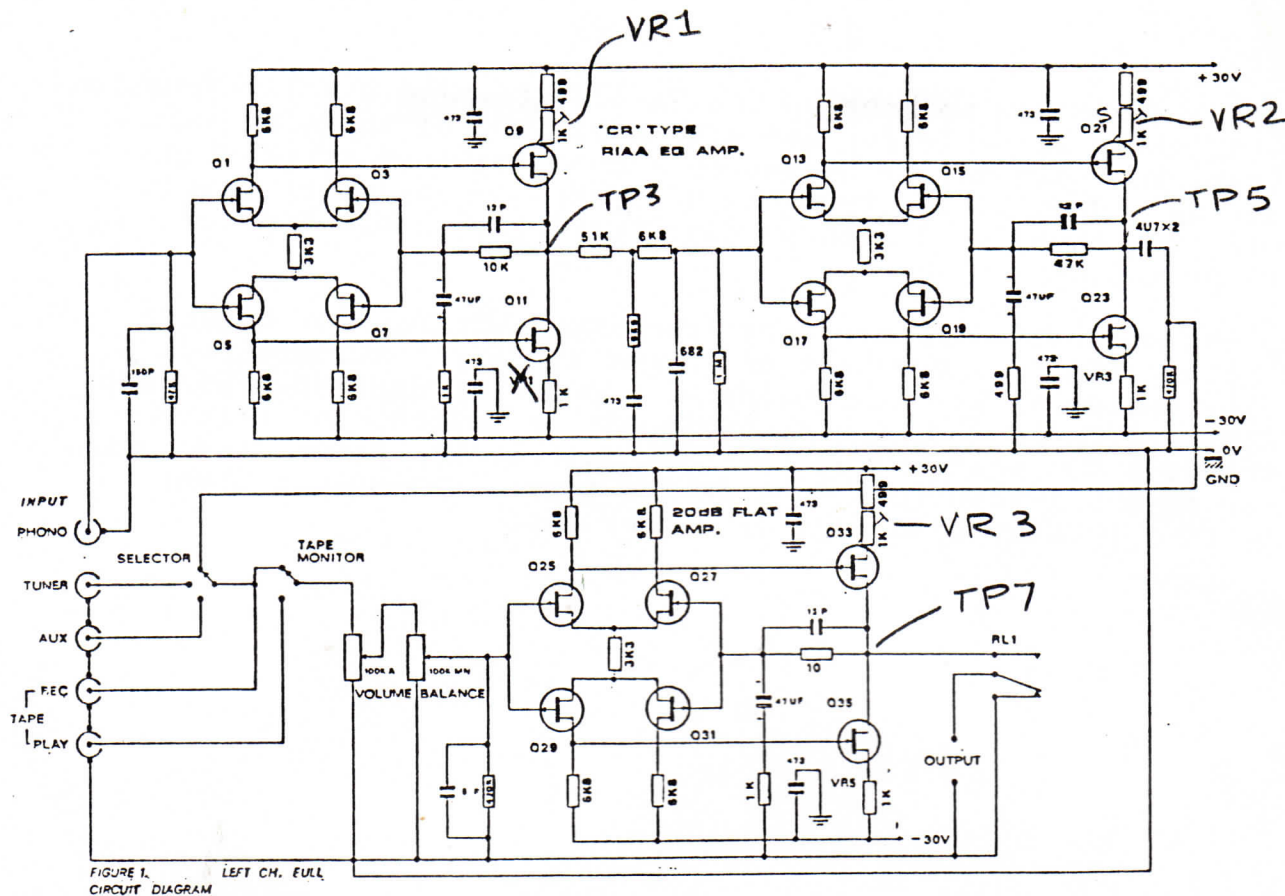
Figure 3 shows how to hook up the TA-377A to make a fully functional pre-amplifier suitable for use with a variety of input signal sources. The unit may be housed in a metal cabinet to provide shielding. Input wiring from the RCA jacks and selector switch should be accomplished with shielded wiring to avoid hum and noise pickup.

Keep the power transformer away from input wiring. The balance and volume controls are twin or ganged 100 K potentiometers. The LED indicator may also be panel mounted if desired. The tape monitor switch is a two pole, two position switch. The selector switch is a two pole, three position switch. The power transformer should be a shielded (not open frame) type and should deliver 30 volts typically each side of center tap.

11-8000 342-5475

★ NOTE CORRECTIONS

RECOMMEND.



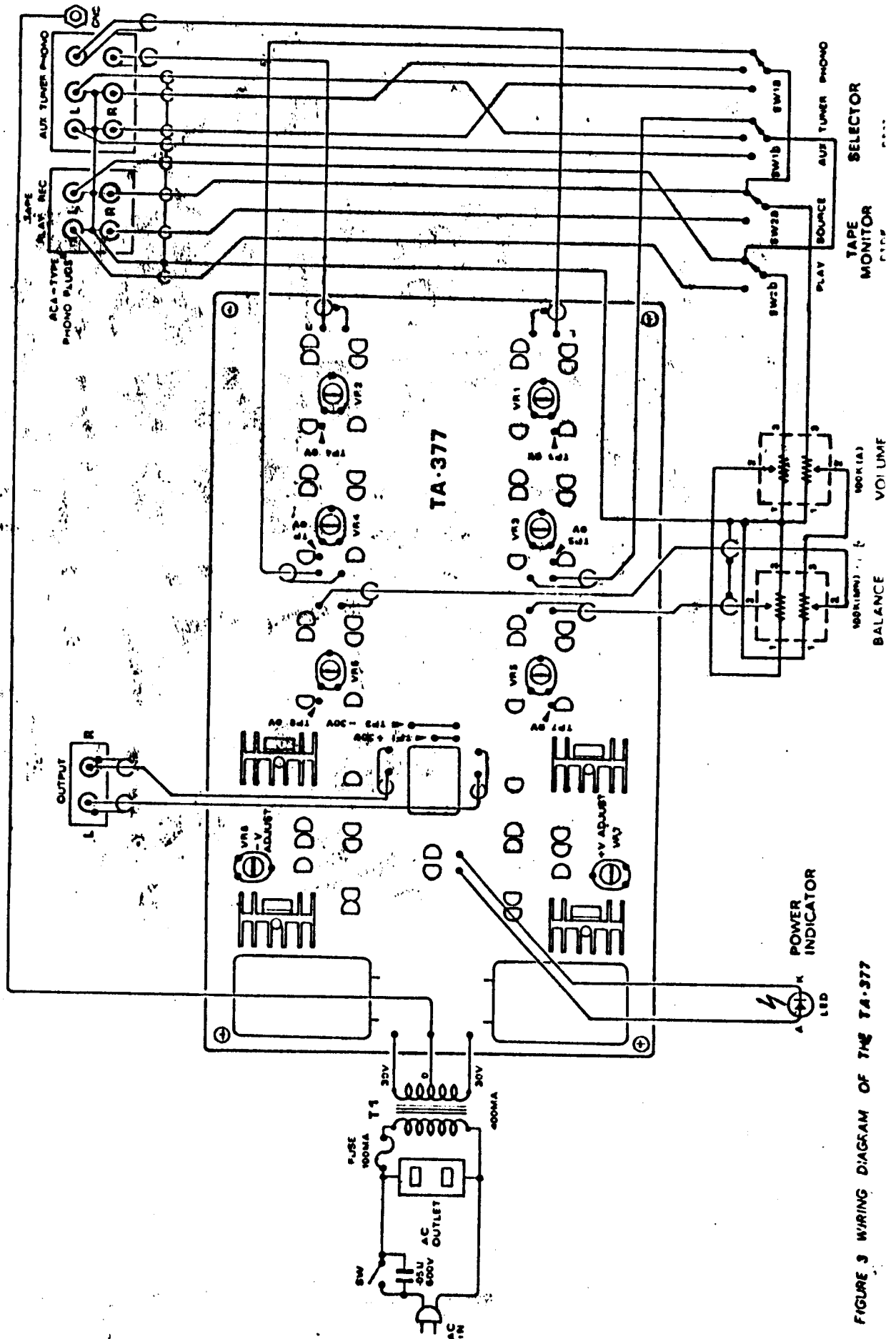


FIGURE 3 WIRING DIAGRAM OF THE TA-377

"ALPS" Controls
typical connections

