

PUTTING THE QRP COMPANION ON THE AIR

1. Connect the wall transformer to the mating connector on the Companion. Plug the transformer into a power outlet.
2. Plug the cord labeled 12 VDC OUTPUT into the QRP PLUS Transceiver power socket.
3. Connect a coax jumper with SO-239 plugs from the QRP PLUS antenna connector to the Companion XCVR connector.
4. Connect an antenna to the Companion.
 - a. If it is a balanced antenna with twin lead or ladder line, connect to binding posts A1 and A2.
 - b. If it is a random wire antenna, connect it to binding post A1 and connect a jumper between A2 and GND binding posts. Connect any counterpoise to A2.
 - c. If it is a coax fed antenna, connect to the SO-239 connector A1 and jumper A2 to GND.
5. Do not transmit while in the TUNE position.
6. Set the transceiver to the desired operating frequency.
7. Switch to TUNE position. The receiver will show noise from the tuning bridge. Adjust the L and C controls for a null in the noise as seen on the S meter. The switch 100, 200 will extend the range of the C setting if required.

When set for the noise null the SWR on transmit will be one to one. Remember to switch back to OPER before transmitting.

DESCRIPTION

Tuner

The tuner is a design developed for use with military man pack transceivers. It features an exceptionally wide matching range and clear, unambiguous setting with only two controls.

The tuner is inherently balanced and does not rely on an output balun to feed balanced antennas. For single ended antennas, one side is connected to ground.

Noise Bridge

The use of a noise bridge for tuning has the advantage of accurate tuning without putting a signal on the air. The bridge provides a clear, deep null in the S meter reading when the tuner

is matched.

Battery

The battery is a standard gel cell. The type selected is used in many emergency lights and should be commonly available for replacement. A fully charged battery will give a weekend of casual operation on the QRP PLUS.

Charger

The charger provides 240 MA constant current until the battery is charged and then maintains the battery at 13.8 Volts. The charge rate is sufficient to keep ahead of the QRP PLUS on receive and will recover overnight from a discharged battery.

CIRCUIT DESCRIPTION

See the schematic diagram, Fig. 2.

Tuner

The antenna tuner is based on a design developed by Dr. Ulrich Rhode and published in several journals. The primary features are very wide matching range and simple adjustment with two variable elements. The impedance is transformed down to 12.5 ohms by transformer L2. The transformer also allows the rest of the tuner to float for feeding balanced loads. Many tuners use a balun in the output to match balanced loads. With the balun in the reactive side of the tuner it can saturate or become lossy. The transformer in the Companion is on the input, matched side, avoiding these problems.

The matching L network does not need to be reversed because of the 12.5 ohm input. Its range is extended by the shunt inductor L3 and the series capacitor C9.

See QST November 1992 Page 51 for a description of the design.

Noise Bridge

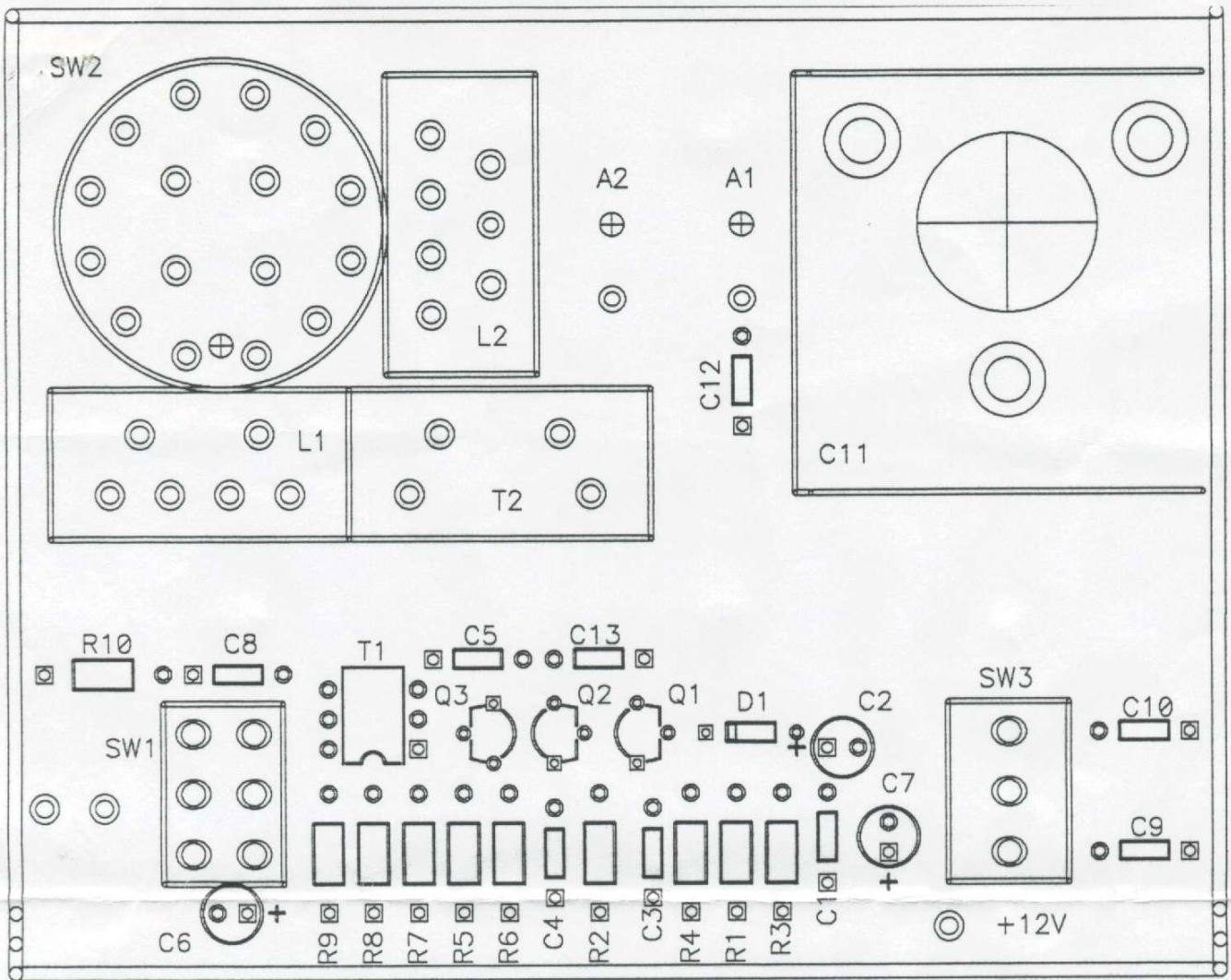
Zener diode D1 is used as a source of wide band RF noise. Its noise output is amplified by Q1,2,3 and associated circuitry.

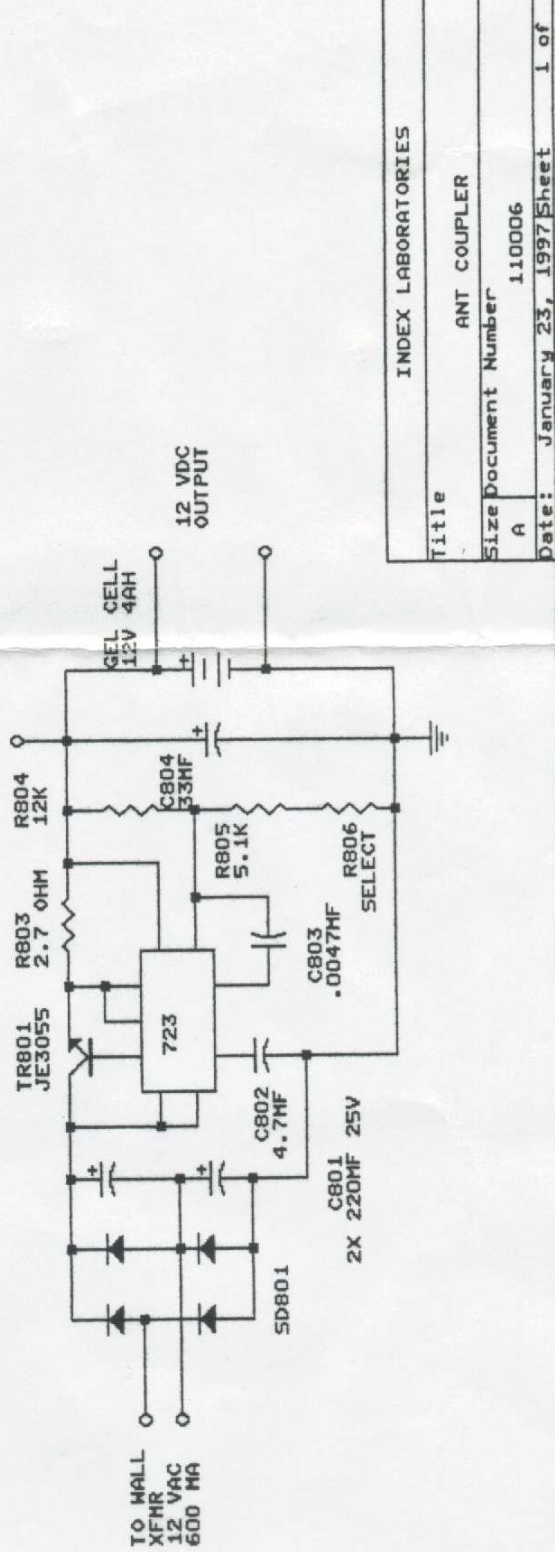
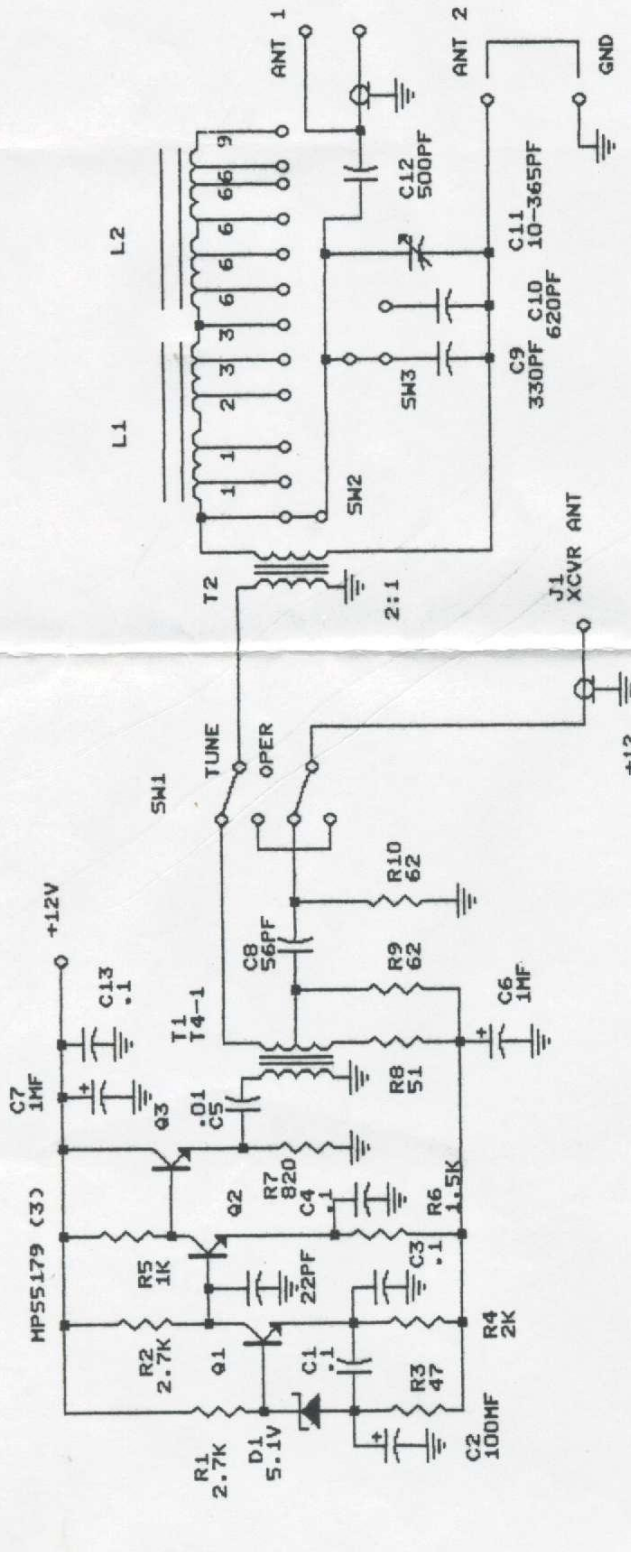
The output of the noise generator is fed to balanced transformer L1. When the impedance presented by the tuner matches the 50 ohm resistor R8, no noise signal is sent to the transceiver.

The attenuator R9,10,11 is used to prevent strong signals from the antenna masking the noise null.

Regulator

The wall transformer provides 12 VAC for the regulator. SD801 is used as a voltage doubler. The 723 acts as a current regulator to provide 240 MA charge current and regulates the voltage at 13.8 V when the battery is charged. R806 is selected to calibrate the 13.8 Volt float level.





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