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# TURNING THE AN/GRC-9 INTO A NOVICE RIG

. . . and it puts out a husky 15W on CW.

The surplus situation out here has been pretty bleak for quite a while, so I figured my luck was bound to change. While wandering through a local junkyard I noticed a small olive-drab box on the scrap pile. Inside was a compact transmitter-receiver covering 2 to 12 MHz! The junkie had decided not to melt it down because it had too little copper in it! After brief negotiations I parted with ten bucks and brought home the set. Since then I have run across others. They are apparently being phased out by the army. The sets I have seen have all required minor repairs, but the performance is well worth the effort.

The AN/GRC-9 is a small five-tube transmitter and seven-tube receiver designed for

infantry packset use and for installation in vehicles. The receiver has a built-in 200 kHz crystal calibrator. The actual tuning range is from about 1.8 to 12 MHz so you can cover 160, 80, and 40 meters. The transmitter can be either crystal controlled or vfo. Full break-in is provided and there is a CW sidetone and provision for netting.

The set was designed for CW, MCW, and AM operation. The MCW mode is illegal, and the suppressor grid AM feature is practically worthless. However, CW performance is quite good. Power output is 15W, but can be increased. One of the best features is an ingenious antenna matching system that will match anything from a short whip to a dipole.



The first step in getting the set on the air is to supply power. For mobile or portable use the army used the PE-237 vibrapack, GN-58 hand generator, or DY-88 dynamotor. The PE-237 is available in quantity, but is useless. Reliability is terrible; it's bulky and the big vibrators are hard to find. The DY-88 is good and will operate from 6, 12, or 24V; but it, too, is quite bulky. The GN-58 hand-crank generator is fun for field portable use, but soon you run out of friends to turn the crank. The supply shown in Fig. 1 provides all necessary voltages and is easily run from a dc-to-ac inverter for portable operation. Incidentally, it will also operate the BC-1306, which is similar to the AN/GRC-9 but covers only 3.8 to 6.1 MHz.

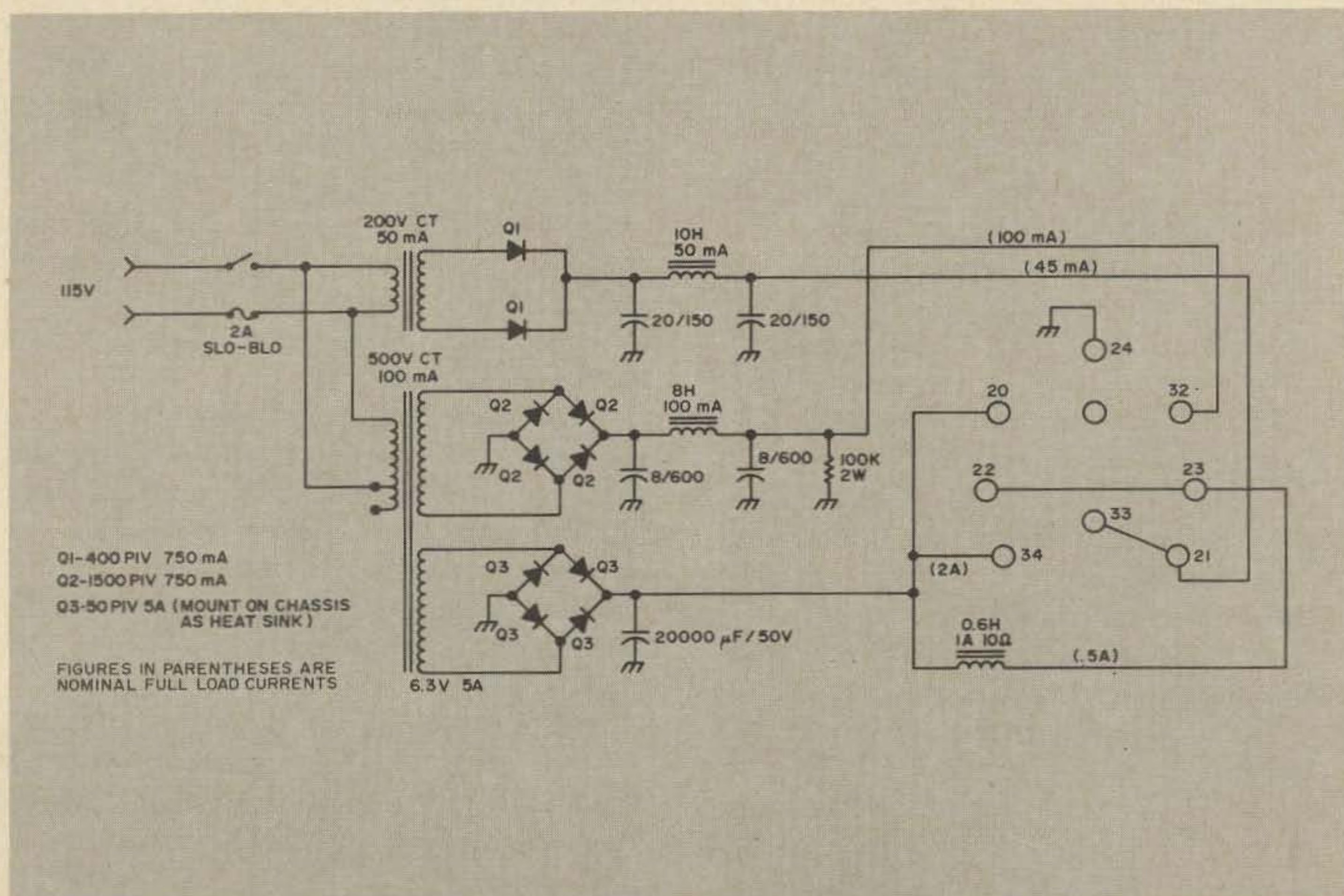
Don't try to change the connector on the transmitter. Get a CD-1086 cable or a PL-279 connector. Watch out for the CD-435 cables. They are quite common and are identical in appearance to the CD-1086. If you get one it will have to be rewired as the pin for the +500V is jumpered to the 1.4V filament pin!

After completing the supply, carefully

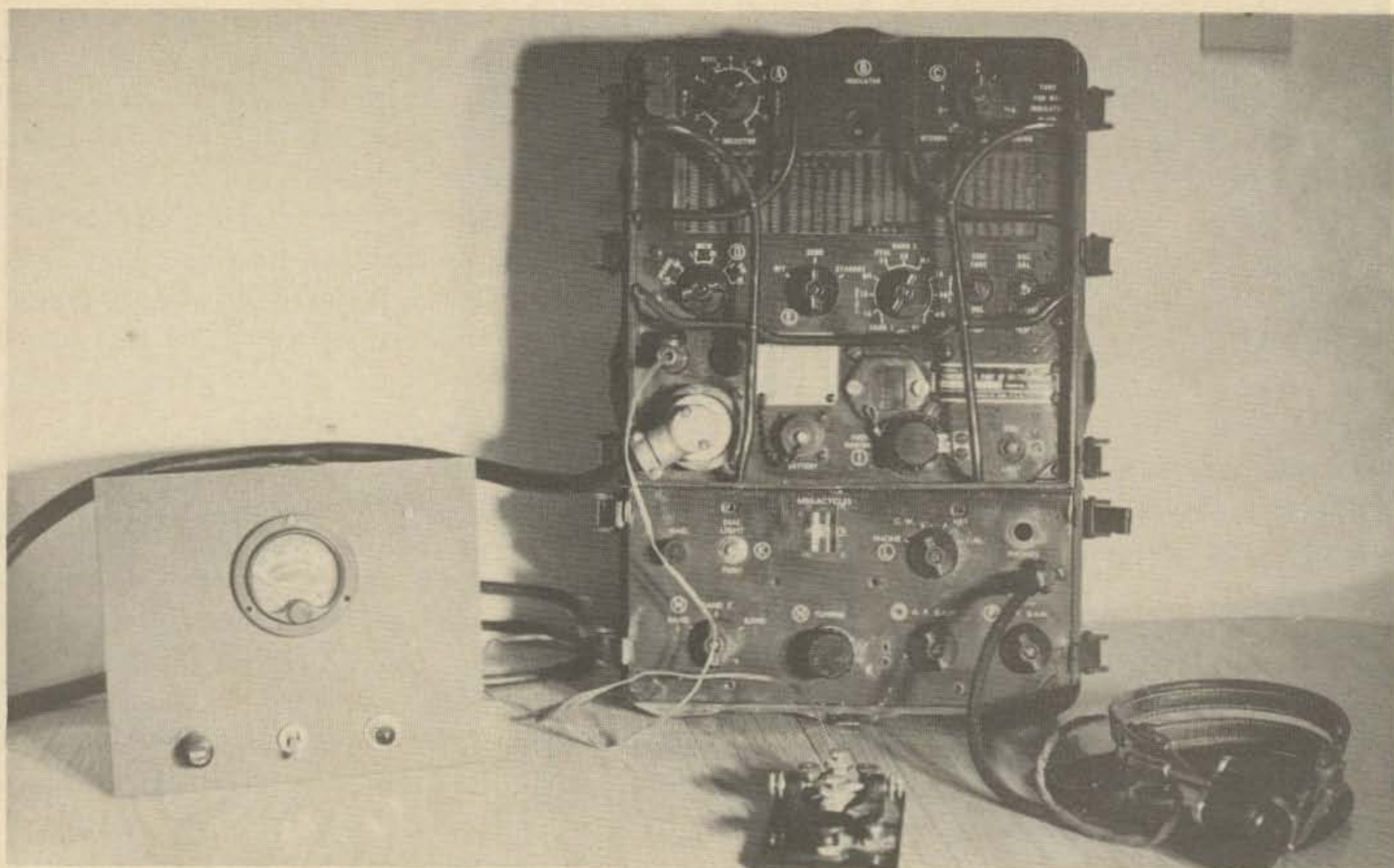
check your wiring and connect the supply to the set. Plug in phones (be sure the impedance switch at the back of the receiver is in the correct position), key, and antenna. The phone jack is also the switch for turning on the receiver filaments. Turn the power supply on and set control E to STANDBY or SEND. Set control A for the type of antenna in use. Set control D to CW-HI. Now measure the voltages. The metering socket, X-110, provides a convenient point for measuring the 6.3V filament and plate voltages. Pin assignments are stenciled on the back plate of the transmitter. The 2E22 plate voltage should be between 425 and 600V. Receiver plate voltage should be 105V, and the 6.3V filament shouldn't be less than 6.0V. The receiver filament voltage is measured on pin A of the BATTERY connector. It should be between 1.2 and 1.4V.

The controls are well marked and self-explanatory; the "net" provision turns on the receiver bfo and the transmitter vfo for zero beating. The calibrate position activates the 200 kHz crystal oscillator which is used

Fig. 1. Power supply for AN/GRC-9 and BC-1306 transmitter/receiver.







*You can save yourself a lot of grief by using the connector already provided on the AN/GRC-9. In the photo here, the homebrew power supply (left) feeds the unit through its original mating connector on the front of the unit. After minimal conversion, all you need to do is add a key and a set of headphones as shown, and you're on the air.*

for calibrating the transmitter vfo using the screwdriver-adjusted OSC/CAL adjustment (control H).

The transmitter's crystal oscillator always operates into a doubler stage, so the crystals must be chosen to be at half the desired operating frequency. Standard FT-243 types can be used. Provision is made for two crystal controlled channels per band.

With the power supply of Fig. 1, the transmitter will operate break-in in either the SEND or STANDBY positions. After a suitable warmup, tune in the desired signal on the receiver. Switch control L to NET and adjust the vfo for zero beat. Now switch L to CW. Set control A to the highest number for the type of antenna in use. Close the key and adjust control C for maximum brilliance on the indicator (which is an NE-16). This will coincide with maximum plate current. If no peak is observed, change A to the next lowest setting and repeat until a peak is observed.

As with all low-power sets, special consideration must be given to the antenna system. For really portable operation, be

sure to have a good ground or get the counterpoise sets (CP-12 and CP-13) that were designed for use with the set. A doublet antenna made with 72 $\Omega$  twinlead is recommended. Antennas AT-101/GRC-9 and AT-102/GRC-9 are specially designed longwires having jumpers for adjusting the frequency. These are desirable accessories.

In the PHONE position, the 2E22 filament is turned on by the transmit relay so there is a delay of about 3 sec after you press the push-to-talk switch. The 2E22 is a rare bottle to come by.

You can substitute an 807 by replacing the plate cap connector, clipping the lead going to pin 4 of the socket, and connecting pin 4 directly to the chassis. But the set will operate in the CW mode only now.

Don't jack up the plate voltage for the final amplifier over 600V as the rf components won't take it.

This set is excellent for the Novice as well as the portable CW enthusiast. Detailed troubleshooting information is contained in Technical Manual TM 11-263.

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