

UPDATE YOUR HEATH HR-10

Among new amateurs the Heathkit HR-10 receiver is a very popular receiver. However although it does a good job on AM signals, its performance on CW and SSB leaves some margin for improvement. One of the problems is the lack of avc action when copying CW or SSB signals. Also the lack of regulated voltage on the local oscillator-mixer and bfo tubes results in some instability on the high bands. The modifications which follow correct these problems to such a degree that it will not seem like the same receiver. The addition of the audio-derived avc brings about the most startling improvement. With the rf gain fully on, copy is excellent on CW and very good on SSB except on very strong signals — all this with the existing detection system, too!

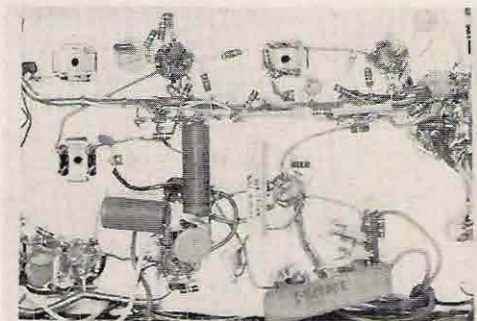
The modifications are not difficult or costly to make. With a little diligence the parts can be purchased for \$10 or less. The changes can be easily incorporated when the kit is assembled. In fact, a new kit with these modifications represents real performance for your money.

Power Supply Modifications

Modifications to the power supply consist of installing silicon diodes in place of the 6X4 rectifier and adding an OA2 regulator tube. Removal of the 6X4 leaves a tube socket for the OA2 and allows addition of the 12AT7 avc amplifier without undue load on the filament transformer. A few directions follow:

1. Remove V7 and unsolder the red transformer leads from pins 1 and 6. The connections to pins 3 and 4 are left in place. Remove the lead to pin 7.

2. Install a terminal strip for the diodes



- and 82Ω surge resistors. Complete the OA2 wiring.

3. Clip the two red leads carrying B+ to the junction of R13 and R41 at the single-lug terminal strip near V2. Solder the two red wires together and tape. Route a lead for the regulated voltage along the rear of the chassis and solder to the vacated lug on the terminal strip referred to above.

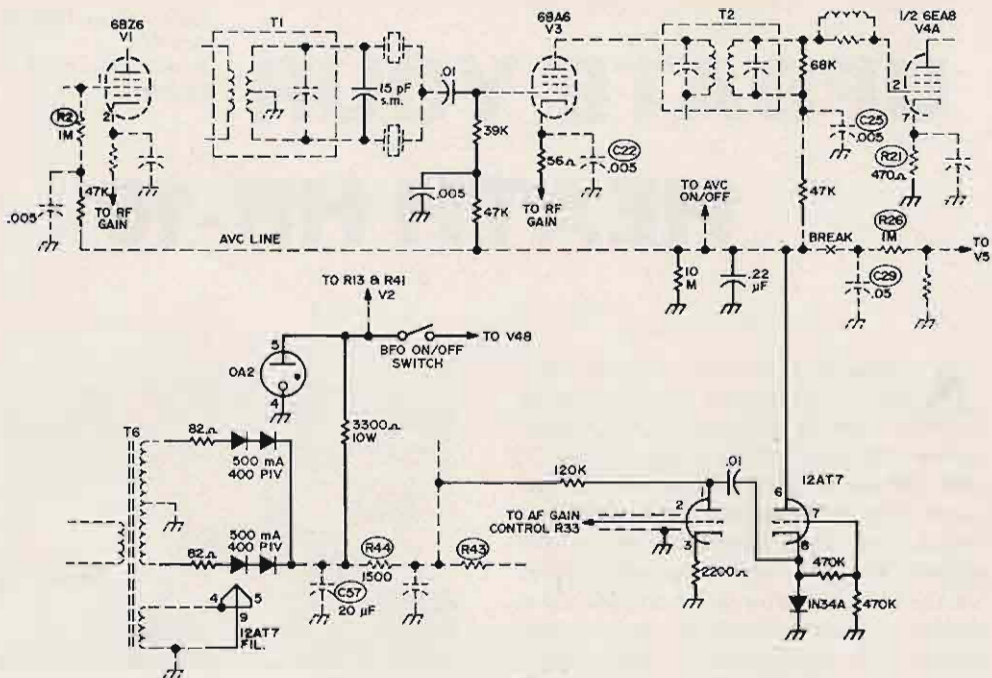
4. Run regulated voltage to the bfo switch to supply V4B. All other stages remain unregulated.

Checks: B+ voltages will read 15 to 20V higher than before modification. A VOM inserted in series with the 3300Ω dropping resistor should read approximately 20 mA for proper regulation.

Audio avc Installation

The existing avc system is discarded except for the avc bus wiring and the avc on-off switch. Notice that the 6BA6 i-f amplifier is modified so that avc can be applied to a third stage. Almost any small-signal diode can be substituted for the 1N34A and either a 12AT7 or 12AU7 will work as an amplifier. Follow the hints below.

1. Remove the fuse block T and install



Schematic showing all wiring changes.

it vertically on the rear chassis apron between the speaker jack and line cord.

2. Install a 9-pin socket between the power transformer and V3. Refer to accompanying photo.

3. Run a shielded lead from the 12AT7 grid to the af gain control. The shield connects to lug 1, the center conductor to lug 3.

4. Ground R21 at V4A. This prevents pinning of the S meter when the rf gain is turned down. Modify the 6BA6 i-f stage. Install 47K resistors in place of R3 and R19.

Checks: With the rf gain fully on, the negative avc voltage should read approxi-

mately 1V with no signal and 6-7V on very strong signals. Voltage measurements on the avc line must be made with a VTVM.

I-f Bandpass Changes

Changes to the secondaries of T1 and T2 will alter the i-f bandpass to give a sharper response. T1 and T2 should be retuned slightly after making these modifications. With antenna disconnected and the gains turned up, adjust the slugs for maximum noise while keeping the "hiss" at its lowest pitch. Alternatively, peak T2 as above and then adjust T1 while listening to a weaker SSB signal. Tune for maximum strength and best sounding signal.

I have made these modifications to several HR-10 receivers, and in all cases the owners were well satisfied with the results. Readers might refer to some earlier articles for background information.^{1 2}

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References

- ¹M. B. Crowley, EI4R, "Controlled Audio AVC System," 73 Magazine, April 1966, p. 84.
- ²W. Montague, VE3FYL, "Heath HR-10 Modifications," 73 Magazine, July 1967, p. 86.

