

SB-303 audio tip

The SB-303 manual and schematic clearly shows a matched pair of transistors in the final audio amp. Q511 and Q512 are Motorola MJE-371 and MJE-512 respectively. You should also check the 100 uf electrolytic for possible failure as well. The driver transistor Q509 is an RCA 2N3053.

11 Pin plugs and sockets

The 11 pin plugs/sockets used by Heathkit and the 2 pin microphone connectors were standard production Amphenol Products and in no way exotic. The originals are commonly available at hamfests, especially if you keep your eyes on those junk boxes under the tables. Amphenol has discontinued manufacture of these plugs, but they have sold the rights, tooling and designs to another company which continues to make them. They are listed in both the Allied and Newark Catalogs as of the last time I checked and, except for the prices, appear to be in every way the same as the original items. The same is true, by the way, for the entire MC line of microphone plugs. The "Heathkit" plug is the MC2M or MC2F depending on which end of it you are talking about. The MC with no numbers is the screw-on plug used on some early Heathkit xmtrs, like the DX-100 and the DX-60. This should not be confused with the MC-1M, which is a single pin plug, otherwise identical in appearance to the MC2M. The MC-3M/F is the somewhat larger plug used on older Sure Microphones such as the 55S, and the MC-4M/F was used by Electro-Voice on their lower end PA microphones such as the 664, 636, 623, etc., all of which were and remain popular with hams in general and Heathkit devotees in particular. This 4-pin plug was also used as a microphone plug by Motorola and other 2-way radio makers in the tube era, and those piles of discarded microphones, control heads, and other 2-way radio detritus left around at the end of every hamfest can provide lots of those for free. There were also MC-5, 6 and 7 pin plugs that I know of, some of which were used on professional condenser microphones to carry filament and B+ as well as audio.

The point is that these connectors are plentiful and available from common sources. You can often have them for under a dollar at hamfests, and if you are in a hurry the mail order supply catalogs have them, albeit at somewhat inflated prices due to the lack of demand. A little ingenuity can produce a lot of results. I was in a small parts house in Chicago recently and saw several MC-3M plugs on a clearance table, still in the original Amphenol bags, and selling for 50% off the original 1972 prices. There is no need to feel like you have to scour the Earth to come up with them.

Cleaning cabinets

For the Heath light and dark gray series of test equipment, and certain ham gear, such as Benton Harbor lunch boxes, is the Megueir(sp?) series of auto finish products. They have a set numbered 1, 2, 3 that is a mild abrasive, cleaner and polish that leaves enameled front panels looking almost new. Available in almost all auto parts stores around Chicago. Another handy automotive product for older gear available at parts stores is chrome restorer, sold in several brands. It will completely eliminate rust that has penetrated through pin holes in chrome fixtures and mushroomed across the surface. Sometimes chrome parts that look like they need replating will look good as new, and there seems to be little recidivism of the cleaned parts. Various soap solutions sold in car parts stores for "deep cleaning" car finishes work well on painted equipment, especially if applied with a tooth brush. Tobacco and cetera come off without much argument.

HR-10 B improvements

- 1 For increased sensitivity: replace the 6BZ6 RF Amp with a 6AK5 (after removing the 120K screen-grid resistor and lifting pin 7 from its ground.)
2. For SSB and CW stability: replace the 6X4 rectifier with diodes, and use the 6X4 socket for an OA2 or OB2 regulator. This should help with your receive pulling off frequency when peaking the antenna trimmer, or when the RFgain is near maximum and you encounter a strong SSB or CQ signal.

HO-10 tips

I have restored two HO-10's and two HO-13's. The 1V2 is suspect. Also replace the two HV caps and any high value resistors around the CRT. The caps are hard to find but you can use two .05 caps in parallel at 1600V . You can get these Orange drops at Antique Electronic Supply. Have also had to replace the 1V2 socket. Use ceramic if possible.

SB-XXX dial repairs

I have repaired several SB-XXX dials, including gluing broken ones back together. Start by removing the two screws on top of the LMO that mount the turns-counter/pilot lites, and set this assembly aside. You can now see down into the guts and access the set-screw on the back of the dial. Next, remove the main tuning knob and the nut around the shaft bushing. Now remove the small curser-set knob on the upper right of the dial escutcheon. Carefully pull the bottom of the escutcheon out about an inch and down a 1/4". Carefully push the little shaft through the hole in the escutcheon and set it aside. Remove the bottom and top drive pulleys.

At this point in time it is nice to have a special wrench. You will need an Allen wrench to fit the set-screws, about 6" long. I took 2 ea, 4" wrenches to a welding shop and had them cut the bend off of one and weld the 2 together.

Using the above wrench you can now loosen the dial set-screw to calibrate the dial or to remove it. To remove the dial, first remove the 4 nuts holding the LMO in place. Slide the LMO back and lift the dial out the top. Anything more than this will require removing all the knobs and shaft washers and nuts, and the 2 top 6-32 screws and nuts, and remove the front panel.

Adjusting HW-101 VFOs

I find Heathkit's instructions on aligning a vfo confusing if not plumb wrong. I use the following method on all vfo's, regardless of make, model or frequency. It works!

As a rule of thumb, you set the tuning capacitor to fully meshed and adjust the coil for the lowest frequency of the vfo (not necessarily the dial); then open the plates and adjust the trimmer capacitor for the highest frequency of the vfo (not necessarily the dial), plus 1/2 the error. In other words you over-correct. Go back to the lowest frequency and set the coil "right on", back to the high frequency end and set it "right on" plus 1/2 the error. Each time you do this the error becomes smaller until you are "right on" at both ends.

Neutralizing finals

For those who might still be interested in how to neutralize a final stage the old fashioned way, here it is again. The instrument used as a sensitive RF detector is now an old Boonton Model 91-AC RF voltmeter at the dummy load. Used a T connector. Next time, I'm thinking of trying a Tektronix 465B with a 10X probe. I think the one I have has about 12pf capacitance at the tip.

1. First turn on the rig and let it warm up for about 1/4 hour.
2. Tune for max power out on 10 meters into a dummy load.
3. Turn off the rig and give it time to bleed the power supply voltages before the next step!
4. Remove plate and screen voltages from the final stage.
5. Turn on the rig and key the transmitter. Adjust the neutralizing cap for minimum indication on a sensitive RF indicator (see above).
6. Adjust final TUNE control for max indication.
7. Repeat steps 5 and 6 as needed until no further improvement can be noted.

8. Turn off the rig and wait for the high voltages to bleed off before reconnecting the plate and screen voltages to the final!!!

Usually, I start on the highest scale of the voltmeter which is the 3 volt range. By the time I'm done neutralizing, I get approximately 200 millivolts. I think I gave the wrong value earlier. To check if the rig is properly neutralized, check that maximum power output and final dip occur at the same point. I've been doing this procedure on most of my rigs which include Drakes and Heathkits. The only one I didn't use this procedure on was the Heathkit SB-110A. That one was a special case.