Ham Radio 101
The Anatomy of a Restoration
Part 4

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For this article, I continued to concentrate on an HW22A Heathkit single band transceiver. It covers the 40M band from 7.2MHZ to 7.3MHz. This was the phone band when it was originally designed.

Figure 1
Front of the HW22A

It has been a while since I have been active on ham radio. I have been recovering from congestive heart failure. This has precluded me from working in my workshop.

I have come up with a check-out of equipment that is new to you.

I removed the cover and made sure all of the tubes were seated.

I connected the power supply to a Variac and then increase the AC voltage slowly until reaching 120Vac. As the AC is increased to 120Vac, the pilot lamps will begin to glow. If they do not, replace the pilot lamps. They are type 47 and they are available on EBay for a nominal fee.

I would measure the AC voltages on the crystal oscillators. I would also measure the AC voltages on the VFO. If you find that the crystal oscillators are dead, do not use them. They may be 50 years old and subject to failure. I use the crystals from International Crystal. They are located in Oklahoma. For frequencies, below 5 MHz they may be a bit pricey but they are worth the extra expense.

As the AC voltage has increased, there should be some activity on the S Meter. Figure 2 is the simplified circuit of the S Meter.

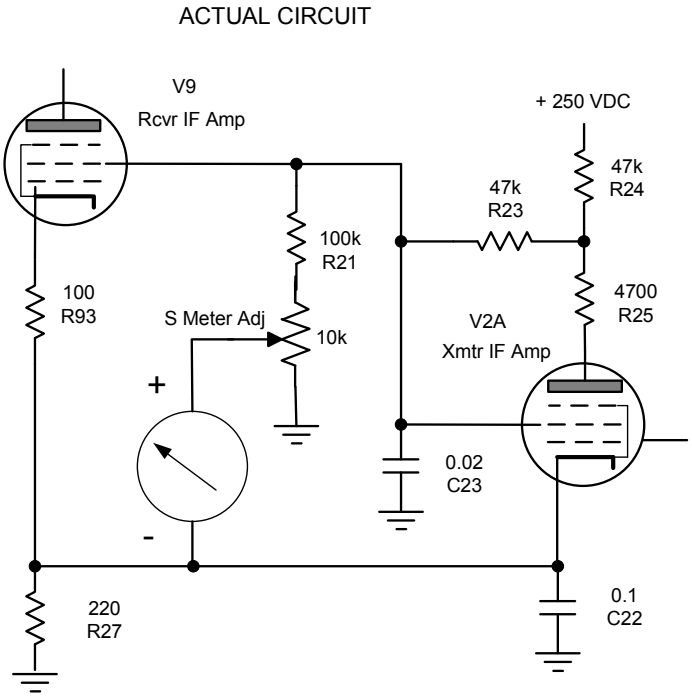

Figure 2
Simplified S Meter Circuit

If you remove the driver tube 12BY7, and then adjust the Meter Switch ("Tune/Bias") switch to the Bias position, the meter indication should rise to the arrow on the S Meter. That shows that the final tubes have enough bias. If it doesn't rise to the arrow, then adjust bias adjust on the rear panel until the meter needle is at the arrow.

Another check on the transmitter is to replace the 12BY7 and let the transmitter to heat up sufficiently so that the radio does not drift.

Set the Meter Switch to the “Tune/ Operate” position. Set the Function Switch to the “Tune” position. Adjust the “Tune Level” adjust so that the meter is indicating an S3 to an S6.

That should show enough power output. Adjust the “Final Tune” adjust for maximum power out.

Adjust the function switch to the PTT position. The mic gain has to be set for optimum adjustment.

After that, the transceiver is ready for operation.

However, during the final checkout, the radio went dead again. I thought I was back to square one. There seems to be an intermittent problem in the heterodyne oscillator circuit which was corrected. It was corrected by re-soldering around the tube socket.

I also found an error in the microphone circuit. There is a resistor in series between the microphone and the grid of the microphone amplifier tube. See Figure 3.

In the schematic, it is listed as a 100K ohm resistor. In the assembly diagram, it is listed as a 10K resistor. I have seen both values assembled on different units. I chose to change the 100K resistor to a 10K resistor.

I want to acknowledge John White VA7JW for the help provided in sorting the S Meter circuit. It appears that there are errors in the Heathkit schematic.

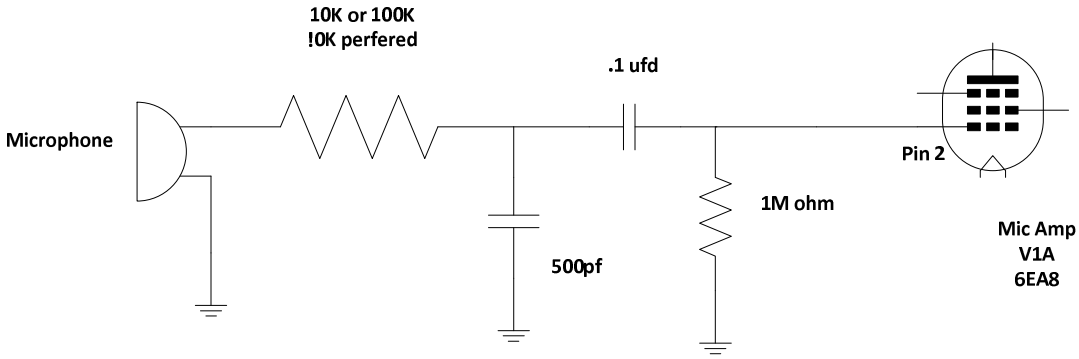

Figure 3
Microphone Amplifier Circuit

The final adjustment was to re-solder the tube socket around V14. That seemed to put to rest any more intermittent problems.

My plans are to operate the radio and make some contacts with it.

Editor's note: The picture in figure 1 is not the rig being restored. It is used only for a sample of an HW22A.

If there are any questions or comments, please contact me at WB6WXO@SOARA.org.