



Heathkit of the Month #81:

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AMATEUR RADIO - SWL

Heathkit K-2 Three-Tube All-Wave (Regenerative) Receiver

Introduction:

Last month's article looked at the K-1 All-Band receiver that Heathkit released in May of 1948 alongside two other kits, the T-1 Signal Tracer and the C-1 Condenser Checker; these were the 9th, 10th and 11th kits released under the Heathkit name.

Last month there was speculation in my article about the release date of the K-2 and what changed from the K-1 to the K-2. Little information was available on the web and from fellow Heathkit historians. However, shortly after the article was printed in the Orange County Amateur Radio Club Newsletter, I received an email, all the way from Belgium, from Alfred Maistriaux. He pointed me to an article on the K-2 that appeared in the Old Timer's Bulletin, vol. 33/4 (OTB is a publication of the Antique Wireless Ass'n.) The article includes parts of the K-2 manual including the schematic. Also, the date of the manual publication is given. Thus a lot of the questions from last month's article can now be answered thanks to Alfred Maistriaux taking the time to pass along valuable information.

The Heathkit K-2 All-Wave Receiver:

The date on Heathkit's K-2 schematic and layout drawings of June 20th, 1949 lets us know that the K-2 most likely started shipping in July of 1949. Remember that Heathkit did not use model numbers on their advertising, so anyone ordering the "All-



Figure 1: The Heathkit K-2 All-Wave Receiver. If you look close at the lower center you can almost make out the works "Model K-2". More on this photograph in the Summary.

Wave Receiver" kit would automatically receive the K-2 as soon as the K-1 stock was depleted. This probably occurred in July. The K-2 continued to ship until the end of 1949 after which it was no longer advertised. Heathkit introduced the AR-1 Three-band superheterodyne receiver in December for \$23.50 (\$30.75 with speaker and cabinet), a more serious shortwave radio.

The K-2 was never produced in the two-tube battery operated version since that option was dropped in the K-1 in mid 1948.

K-2 Layout:

The K-2 layout closely follows the K-1. It is shown in figure 2. If you compare the top view to the K-1 top view (presented in last month's article) you will find it difficult to see the changes. They both use the same K-30 chassis. The tube designations are different, as expected, as is the resistor/capaci-

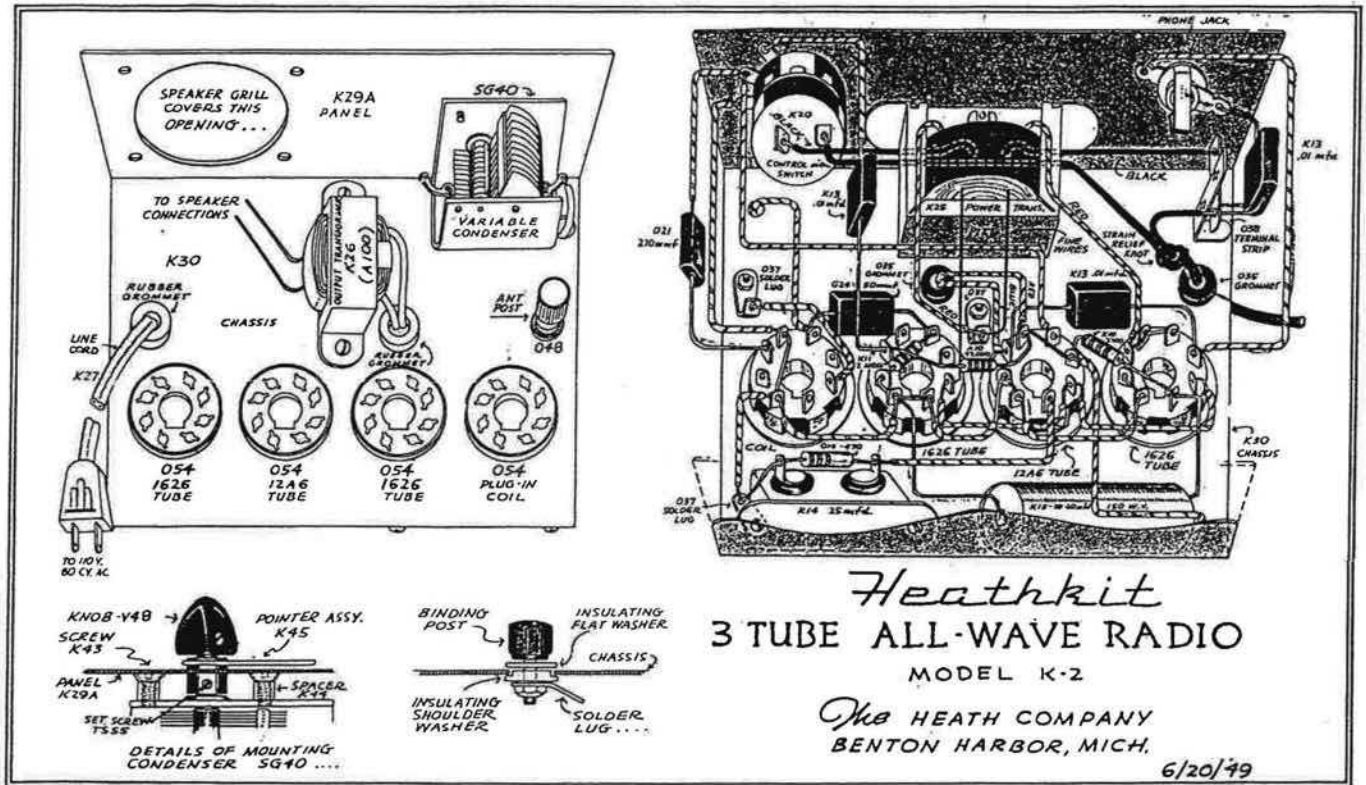


Figure 2: Layout (top and bottom) of the Heathkit K-2 All-Wave Receiver from the Manual as reprinted in Antique Wireless Association Old Time Bulletin #33-4.

tor combination from the tuning condenser to the grid cap that fits on the K-1's 12C8 tube. The front panel part number has been changed to K29A and now includes the model number on the front panel. Also the tuning condenser part number has changed from K15 to SG40. This confirms my theory that the later K-2 has vernier tuning. The details of the mounting of the condenser shows this with its separate pointer assembly (K45), screws and standoffs to allow room for the vernier mechanism (Figure 2 inset). Some of the K-2s I've seen photos of are modified with larger knobs to ease the tuning further.

Looking at the underside of the layout in Figure 2 there are lots of changes because two of the tubes have been changed. Of note is that many of the component values as well as part numbers are now given for the resistors and the smaller capacitors.

The K-2 Circuit:

The K-1 circuit was discussed last month, and since the changes are mostly to the circuits of the two changed tubes, that's all that will be discussed.

The K-2s rectifier circuit is identical to the K-1 except the 12A6 beam power pentode has been replaced with a 1626 triode with the grid connected to the plate. The 1626 tube was used in the command sets and many were made and available cheaply in surplus after the war. Heath probably did this to save a few cents and allow them to add the vernier without raising the price.

To help cut costs further they also replaced the regenerative receiver tube from a 12C8 to another 1626. This was a bigger change as the 12C8 is a pentode and the 1626 is a triode. In the K-1 the **VOLUME** control changes the voltage on the screen grid of the 12C8 to

control the regeneration. Since the 1626 has no screen grid another type of regeneration control had to be used. The coils used with the K-2 are the same as used with the K-1. Each coil has three windings, an antenna coil winding, a grid coil winding and a “tickler” coil winding. The antenna coil is between the antenna input and ground and is closely coupled to the grid coil, which is tuned by the tuning capacitor, and passes the signal to the grid of the receiver tube. The “tickler” winding provides regeneration feedback to the grid coil. In the K-1 this coil went between ground and the cathode of the receiver tube. Due to the proximity this coil also couples energy to the antenna if the regeneration is set high enough that the circuit is oscillating, which can create an interference problem to stations nearby. Since no screen-grid is available using the 1626 triode tube, Heath coupled the output from the plate through the regenerative VOLUME control to the “tickler coil” to get regenerative feedback. Since the signal from the plate is 180° out of phase with the signal from the cathode, the “tickler” coil is connected in reverse from the K-1.

The audio amplifier continues to use a 12A6 power-beam pentode and appears the same as the K-1 with the exception of the grid resistor being changed from a fixed resistor to the regenerative VOLUME potentiometer.

Summary and Comments:

The K-1 and K-2 likely started many youngsters thinking about a career in electronics. When you build a piece of electronic equipment either from scratch, from a article in a handbook or magazine, or from a kit, you tend to learn a lot more than you would just studying for a ham license and firing up a store-bought radio. If you started from scratch and are successful you are either already well skilled in the field, or you have learned a lot in the process.

K-1 and K-2 All-Wave receivers are probably a Heathkit you won't want to own unless you are a collector. Still it is a part of the early Heathkit legacy and an interesting radio worth discussing.

What's Coming Next:

The holiday season is upon us. I'm going to be busy helping a relative get settled into their new home. Thus I may not have an article next month. I do have two Heathkits in the mix, both test equipment and both I have manuals or good information on; one is a piece of radio related test equipment. I also have a Heathkit IM-4180 FM Deviation Meter that I need to use and become familiar with before I feel comfortable writing an article with it as the subject.

I've had a few people ask about the machinations of my articles. Questions like why I often use old words like condenser instead of capacitor, etc. Also I'm occasionally asked about the logo I use at the beginning of an article. While I'll be the first to admit I mess up often, I try to use the logo and the technical words from the era of the kit I'm writing about.

Finally, on the photo in Figure 1. It is a cropped photo I found on the QRZ website. I tried to contact the person posting the photo multiple times to get more information without any response.

73, from AF6C



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Remember, if you are getting rid of any old Heathkit Manuals or Catalogs, please pass them along to me for my research.

Thanks - AF6C

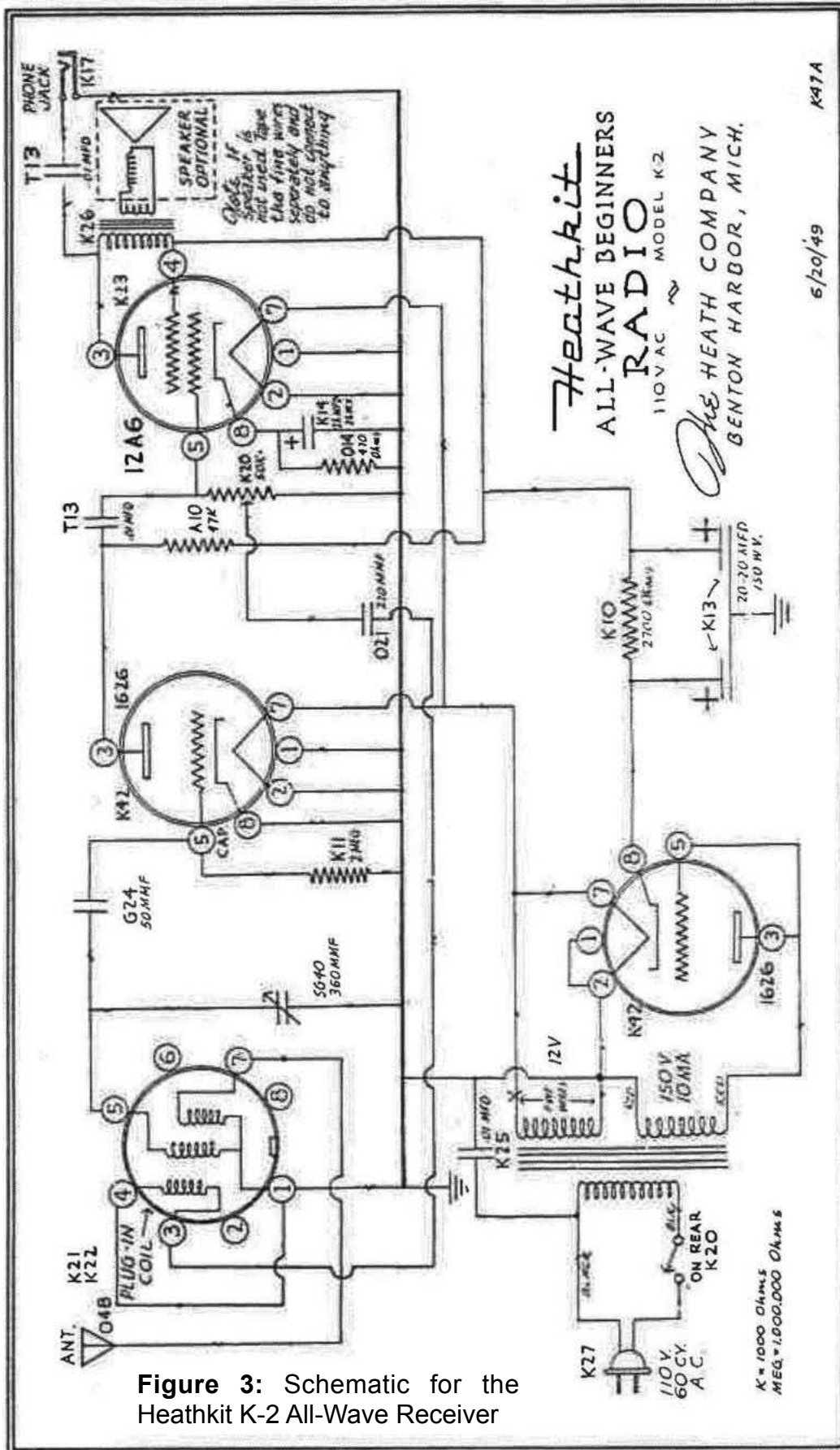


Figure 3: Schematic for the Heathkit K-2 All-Wave Receiver