

The Heathkit SB-230 Kilowatt!

By WA6MHZ

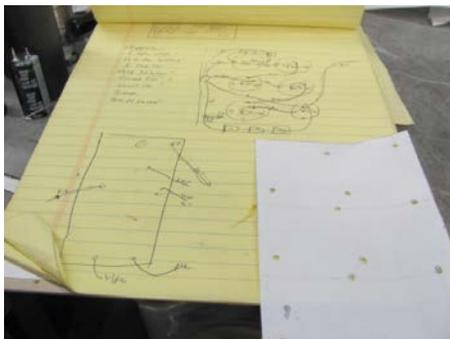
At the Dayton Hamvention this year, I made a deal of a lifetime! A seller had a nice looking SB-230 he wanted \$250 for. I weaseled him down to \$200 and joyfully carted it back to the Town Car, much to the wife's extreme disapproval. Here is all the junk I brought home from Dayton!

That item next to the SB-230 is a Heathkit 2 meter Power amp that was used at the ARCEC Field day this year. On top of the SB-230 is a Heathkit SB-634 station accessory. To the right is a HG-10 VFO and above it is a Hallicrafter SX-140. The trunk was VERY FULL on the way home!

First inspection of the SB-230 showed it intact, but the transformer was slightly tweaked due to being bounced around so much. Not a problem. The main thing to worry about is the very rare 8873 tube. Tests showed it was good, so that was great! The Linear has a chance of operating!

I originally planned on converting this amp for 6 meters, as the tube would work great at this frequency. Contrary, the 572Bs in the similar Heathkit SB-200 are marginal at 50Mhz. But, after consulting with many people on the issue, it was decided that converting it would devalue the SB-230 too much, so it would be left a HF linear.(80-10M). It also does the WARC bands nicely as well.

Since the SB-230 would now be used rather than become a Museum piece, I decided to revamp the power supply. I ordered the parts needed from Mouser and they came in quickly.



First up is to replace the capacitor bank. But the SB-230 has them mounted on the aluminum chassis, and the replacements are solder-in jobs. I would need to fabricate a PCB to mount them!

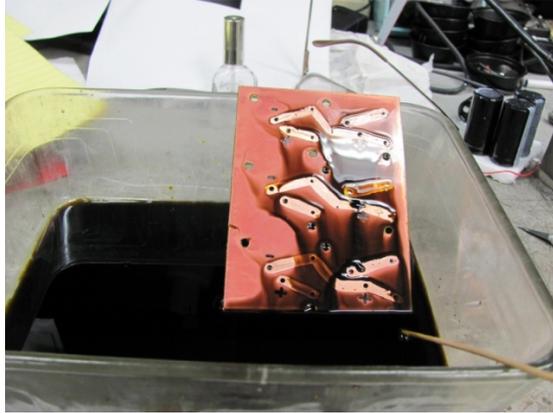
I haven't made a PCB since the early 80s. It is a very tedious and messy affair, and I used the 1980 technology I remember. First, a schematic of how the caps are arranged was made and a template made on where I would like the



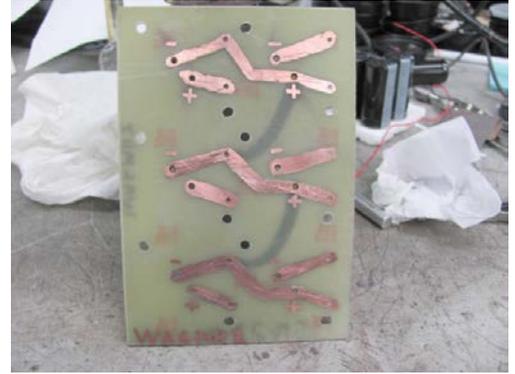
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traces.

The pattern would be transferred to a copper clad PCB I had laying around cut to the right size.



I would use a SHARPIE MAGIC MARKER and Nail polish to mask off the copper I wanted to keep. Then it was time to soak it in the Ferric Chloride, also from the 80s.

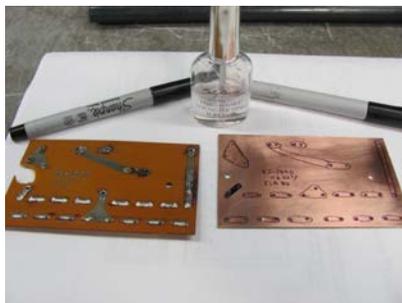


This was very messy and took

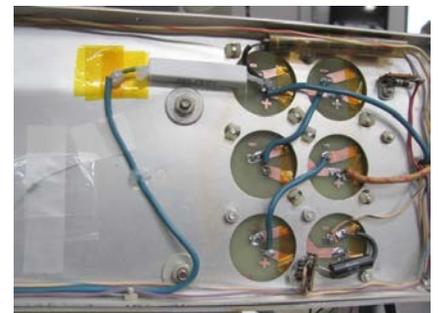
about ½ hour to etch. But finally the PCB was ready and I mounted the new capacitors and bleeder resistors in the board.

The traces look pretty good at this point!

The PCB was wired into the Chassis. OH OH!!! I got a trace backwards going to the wrong caps! The PCB was reworked and corrected. Now it would work fine.



Underneath, I wired the wires as originally to the capacitors through the holes. Also installed was a GLITCH resistor and High voltage fuse in case anything ever goes wrong.



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Now it was time to construct the diode board. This would replicate the original, as it was broken in half from the transformer shifting. I would use the same process to design and etch it.

The diodes were loaded and it looked great!



Unbeknownst to me, I had installed all the diodes on the right side backwards!!! Took a bit of doing to debug that, but now it was quickly fixed, and installed in the chassis.



The Diode and Capacitor boards were fired up and we had WONDERFUL High voltage! First phase of the KILOWATT mods were done!

The SB-230 was tested out at this point and it put out plenty of power with a Kenwood TS-830S driving it. One problem noted was that the Meter light was out. In fact, someone had completely removed the lamp assembly. It is very dark inside the cabinet and no chance you can read the meter behind the dark red Plexiglas. Some lighting was required.

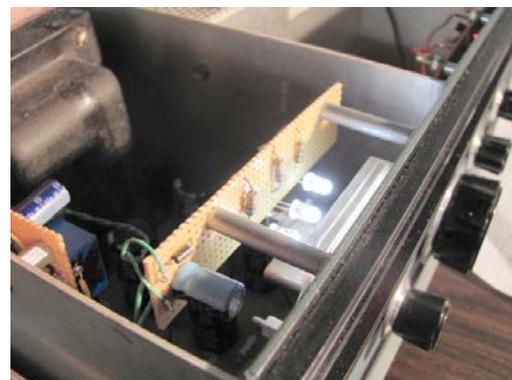


Heathkit used a squirrely scheme of dropping the 110VAC through 2 big resistors down to 28V to power the lamp.

That was most unacceptable since 28V light bulbs are hard to come by. So I decided to update it with LED lighting. I scored 3 bright white LEDs at Radio shack and built a little panel to go behind the meter. For power, I ran a twisted pair of 6VAC up from under the chassis where it was robbed from across the tube filament. Here is how the LEDs were mounted.

The LEDs put out lots of light and illuminated the meter nicely, but too evenly. LEDs have a very focused beam and now there are some darker areas, but it is acceptable.

It looks better than it does in this picture. Easily readable now.



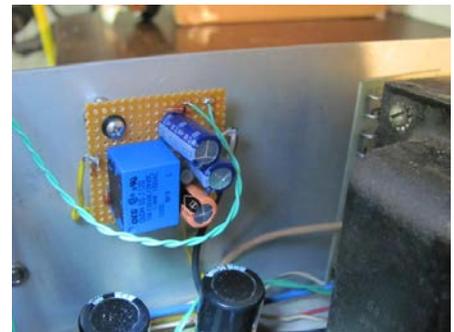
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To switch the Amp into transmit, the Jack in the back has a -125VDC on it; not what you would want to switch through a small solid state rig. So a special relay circuit was built to do the switching. Once again, I robbed the 6VAC from the filaments and made a voltage doubler to get it up to 12VDC for the new relay. Now, there is only a light 12VDC to switch on the relay jack.

The amp was first well tested at the ARCEC KIDS FIELD DAY the weekend before the regular Field Day. It worked great and really put out the power.



While it worked great, the heat sink on the back really got hot after long rag chews. Something had to be done about that! At the Santee Swap meet ARCEC Club booth, Tom N6JOJ had some high power metal muffin fans for sale cheap. I nabbed them and designed



a cooling housing for the heat sink. I bent up some perforated aluminum to enclose the back of the fans. The power for the fans was robbed from across one 110VAC Winding of the SB-230 power transformer. This took some tricky metalwork to accomplish.



The Amp is now ready for PRIME TIME! At some point, I need to paint the cabinet and fan shroud to match. But this SB-230 is ready for the next ARCEC event where the POWER to bust a Pileup is needed!

