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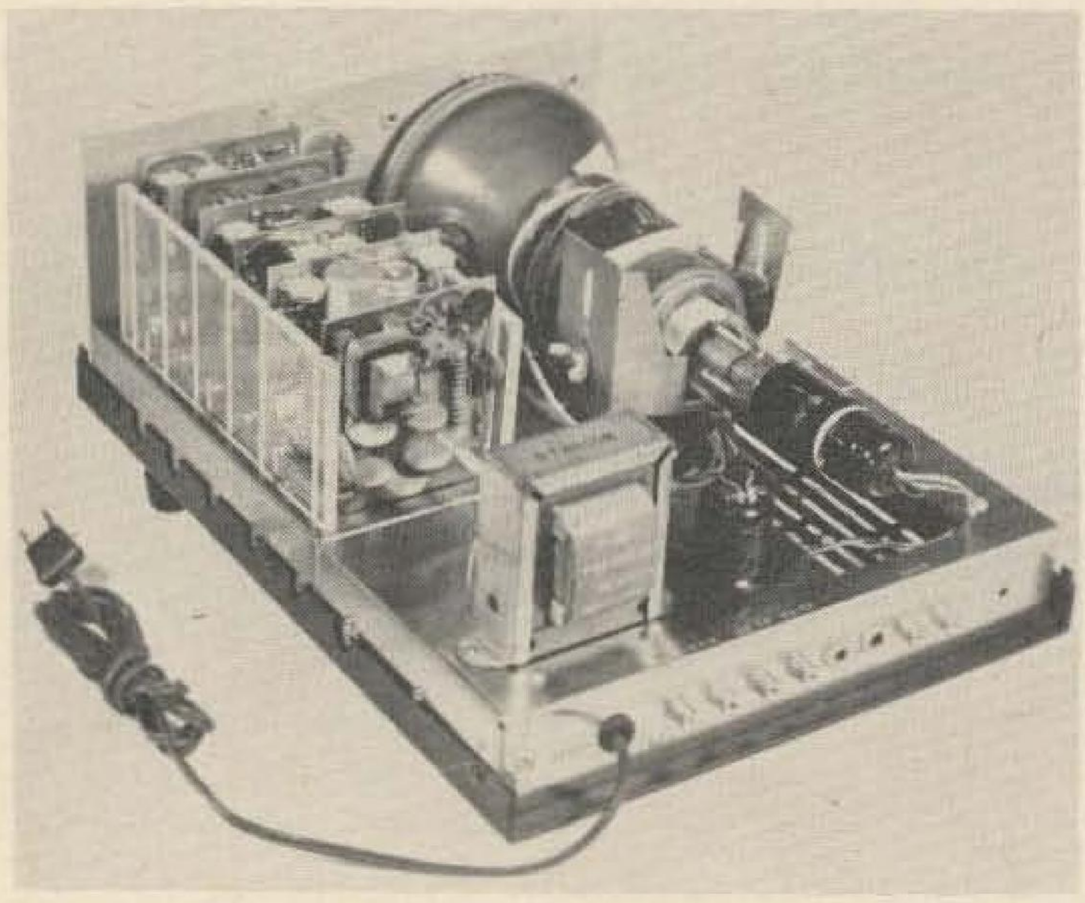
HOMEBREW THIS SSTV MONITOR

This article contains some information that may be useful to someone building an SSTV monitor. It is not a new design, but rather several monitors rolled into one.

I had a lot of fun building the monitor. It took about nine months from start to finish. That means I pretested each circuit, and modified it as I went along so that I knew just what parts it really took to work. When I thought I had a rock solid circuit, I began laying out my PC boards.



Rear view.

Choosing The Tube and Chassis

I had a 5FP7 CRT so I knew I was going to use that tube. At that time a 5FP7 or any other P7 tube was hard for me to locate. I had seen many SSTV monitors at hamfests. While they were original in circuit design and worked very well, they did not appeal to me as a decorative piece of gear. So, if nothing else, I was going to make my monitor look good. Or try to. See Figures 1 and 2, for the monitor and power supply schematics.

I have the Drake T4X, R4A and MS speaker, so I looked into the possibility of using a Drake cabinet. The only factor I had to consider was the size of the CRT. So I got my rule out and did some measuring. I was in luck. The Drake TR4 cabinet was just the right size. If I had chosen a 17.78cm (7") tube, I would not have chosen the Drake cabinet. A cabinet for this tube is a SB-202 Heath Kit cabinet. Anyone who has seen Don Miller's W9NTP monitor at a hamfest

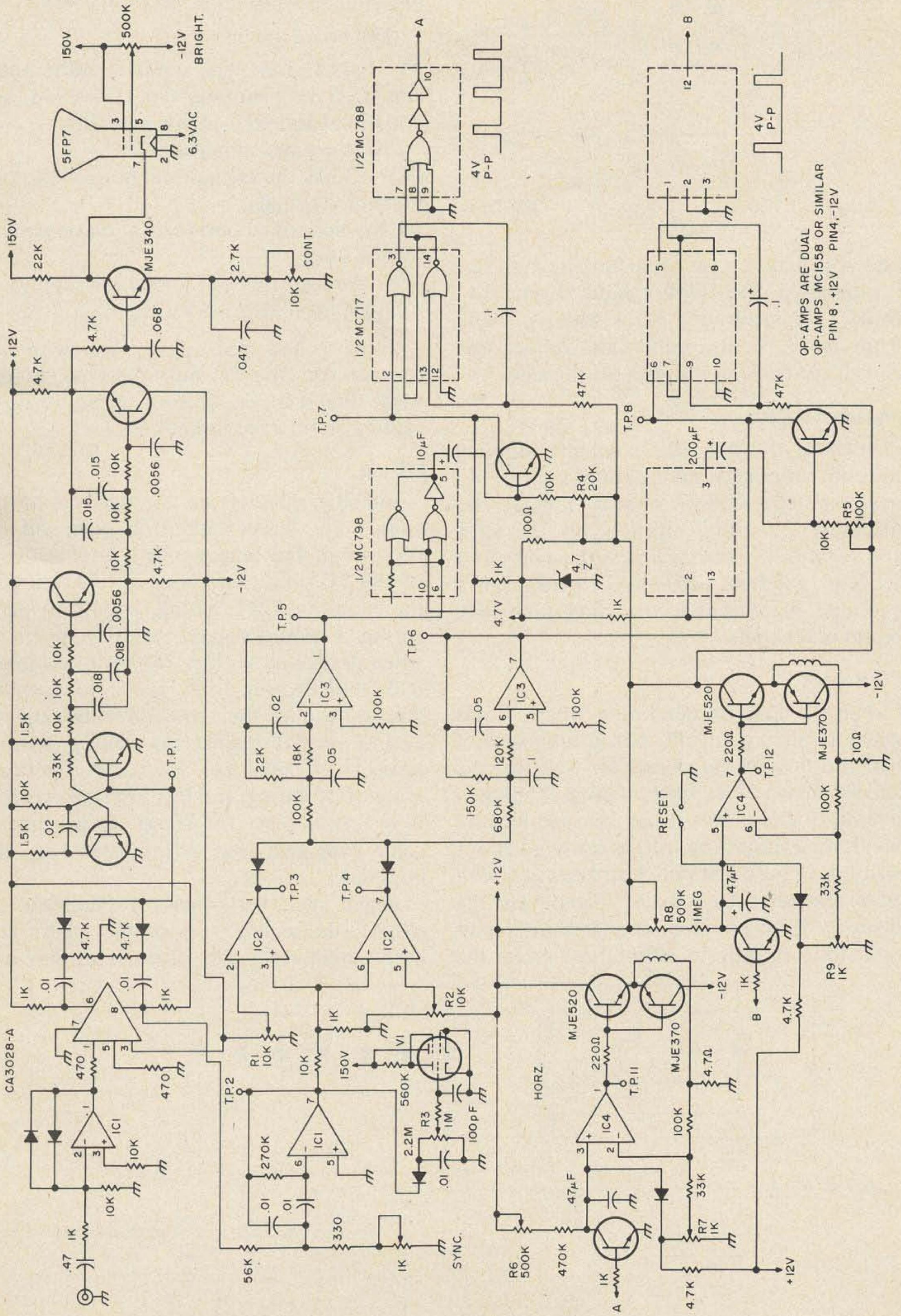

150V
500K
-12V
BRIGHT.
5FP7
6.3VAC
1/2 MC788
A
4V P-P
B
4V P-P
OP-AMPS ARE DUAL
OP-AMPS MC1558 OR SIMILAR
PIN 8, +12V PIN4, -12V
1/2 MC717
1/2 MC798
T.P.7
T.P.8
T.P.5
TP6
T.P.3
T.P.4
T.P.2
T.P.1
T.P.12
T.P.11
IC1
IC2
IC3
IC4
CA3028-A
MJE340
MJE520
MJE370
RESET
HORZ.
SYNC.
+12V
-12V

Fig. 1.

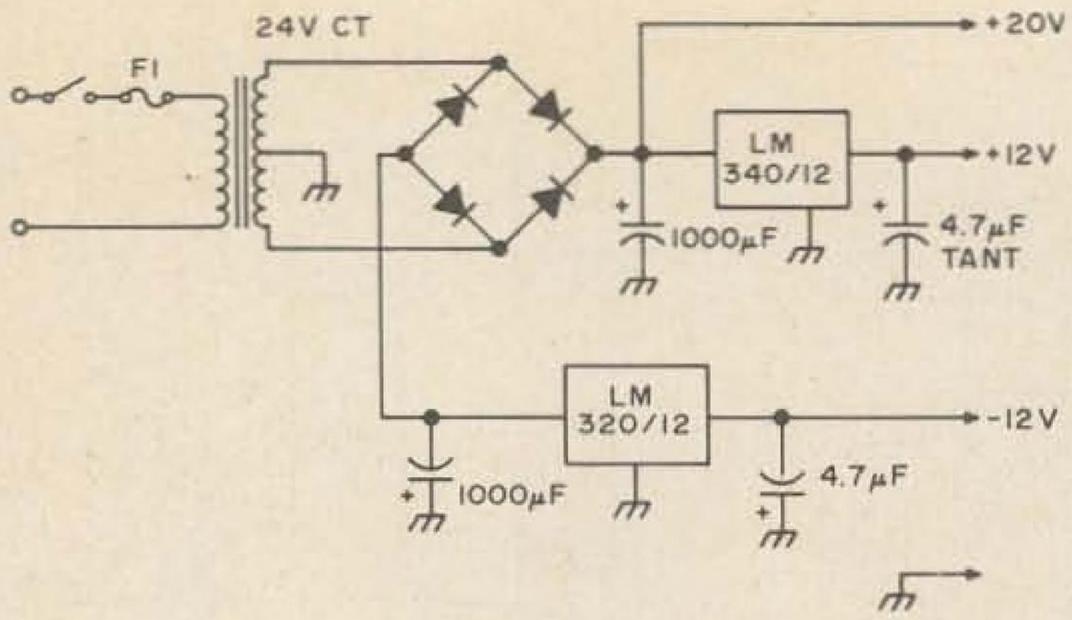


Fig. 2.

knows it makes a very fine looking monitor. I purchased the TR4 cabinet from R.L. Drake and received a blank chassis, blank front panel, wrap around case, rubber feet and all the necessary screws for the case.

Placing To CRT

I chose the left side. I got my nibbling tool out and began taking chunks out of my newly purchased TR4 chassis. I made the necessary mounting brackets for the CRT and located my center line so I could cut a 12.7cm (5") hole in the front panel. Don't you just hate to drill that first hole in a brand new panel?

PC Boards

Next I had to determine where I was going to mount my PC board or boards. I had the rest of the chassis for transformers and PC boards. I decided on using PC plug-in boards. I chose this route because I could break the monitor up into as many parts as I wanted. I could just pull a card out and with an extension cord I made, I could lay the board in front of me on the table and repair or modify it with no difficulty. I broke the monitor into six different parts, so I have six different PC plug-in boards all in a row.

The board lineup:

#1 board has the limiter, differential amplifier, sync tuning, sync threshold, and horizontal and vertical low pass filter;
#2 has the video amplifier;
#3 card has the vertical and horizontal noise immunity circuits;
#4 has horizontal and vertical sweep circuits for the yoke;
#5 is the regulated +12 and -12 V supply;
#6 is the regulated 7.5 kV supply.

I have had no trouble yet with the contacts on the PC plugs and no trouble with the copper getting dirty, thereby causing an intermittent circuit.

Wiring

All the circuits are on the top of the chassis. This leaves the bottom open and free for wiring. The only wiring is between each of the PC plugs, and from all the inputs to the monitor, CRT wiring, and front panel wiring. I would suggest using a color code when doing any wiring. The use of cable ties makes all wiring look good, so keep all wiring running the same direction and up against or flat against the chassis. When a project of any size has any significant amount of wiring, and it is just "hay-wired," it is a good place for "bugs" to get into. A color code and neat wiring helps keep the bugs out.

There are two pieces of Plexiglass on either side of the row of PC cards. This keeps them vertical at all times so they will

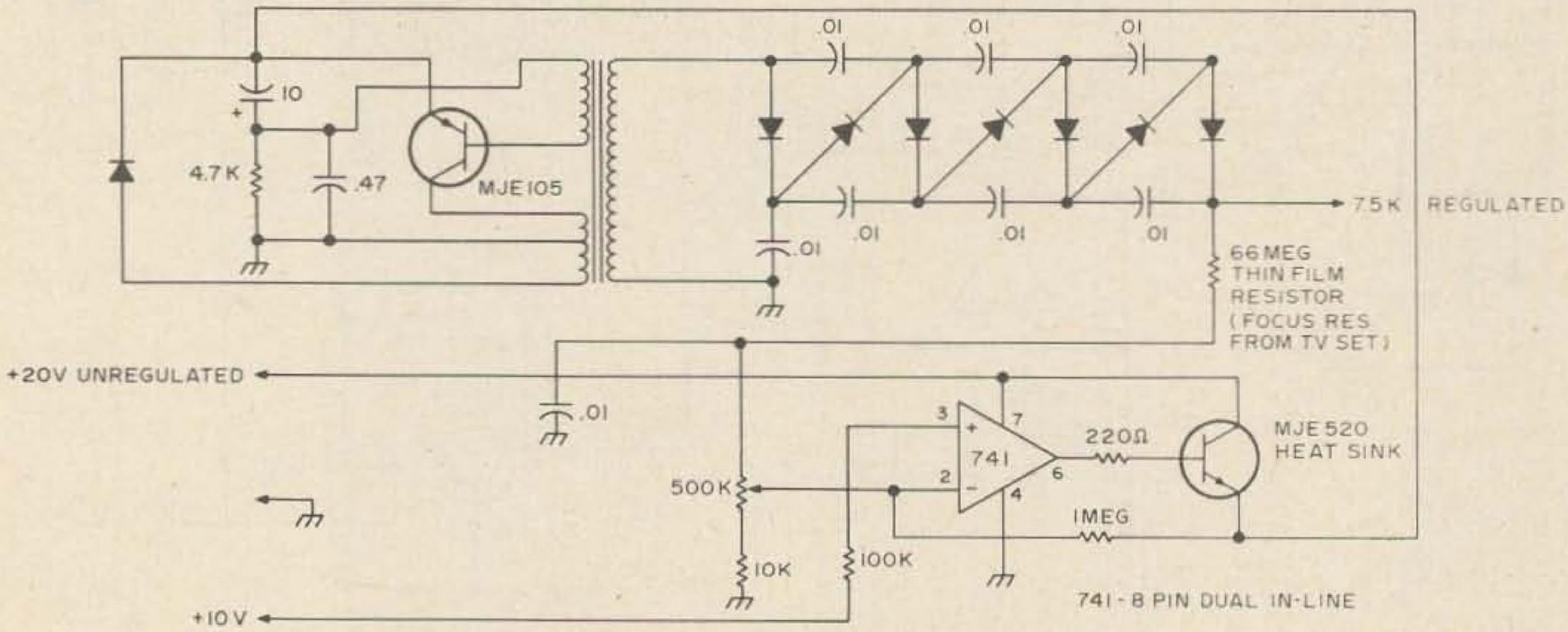
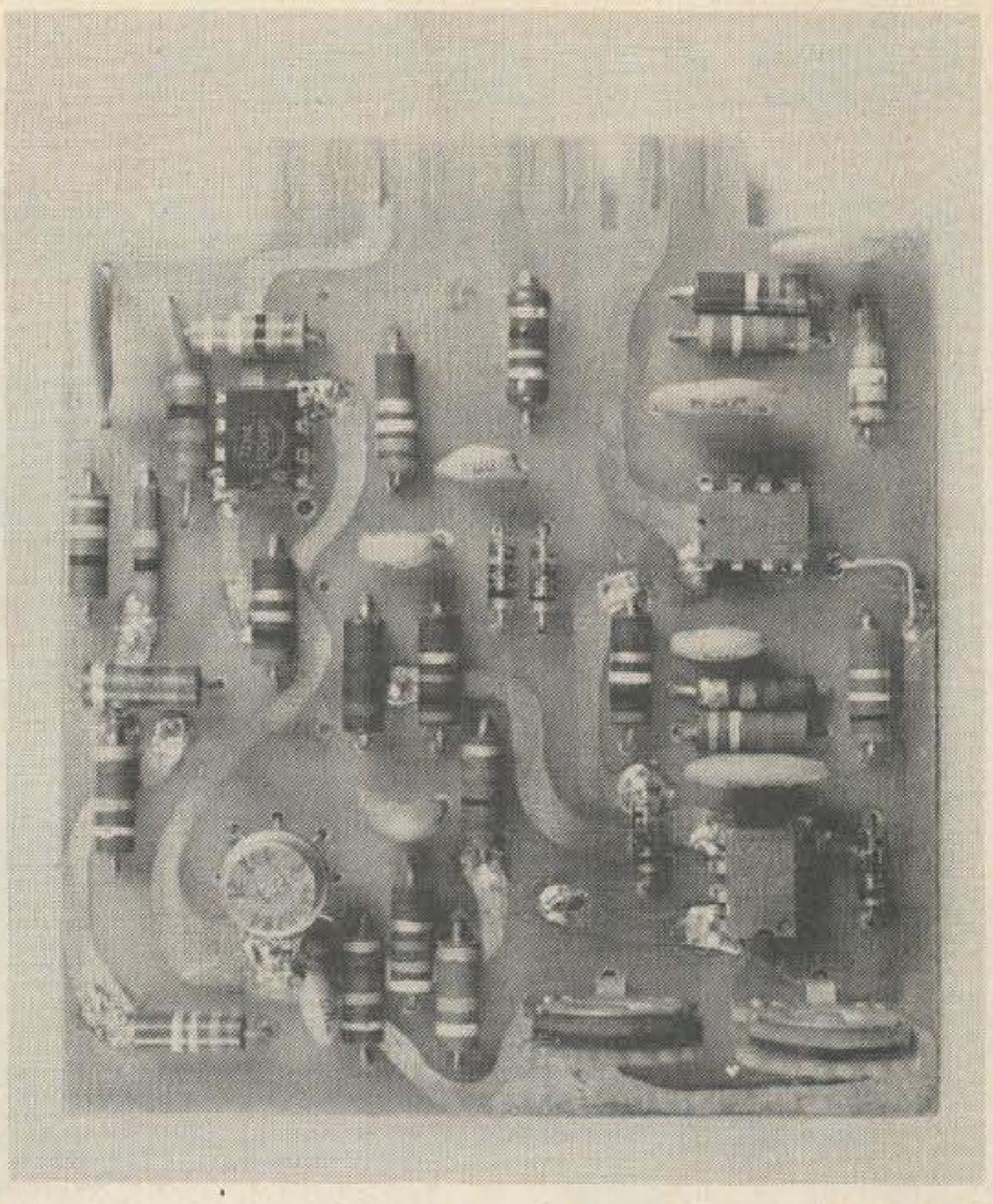


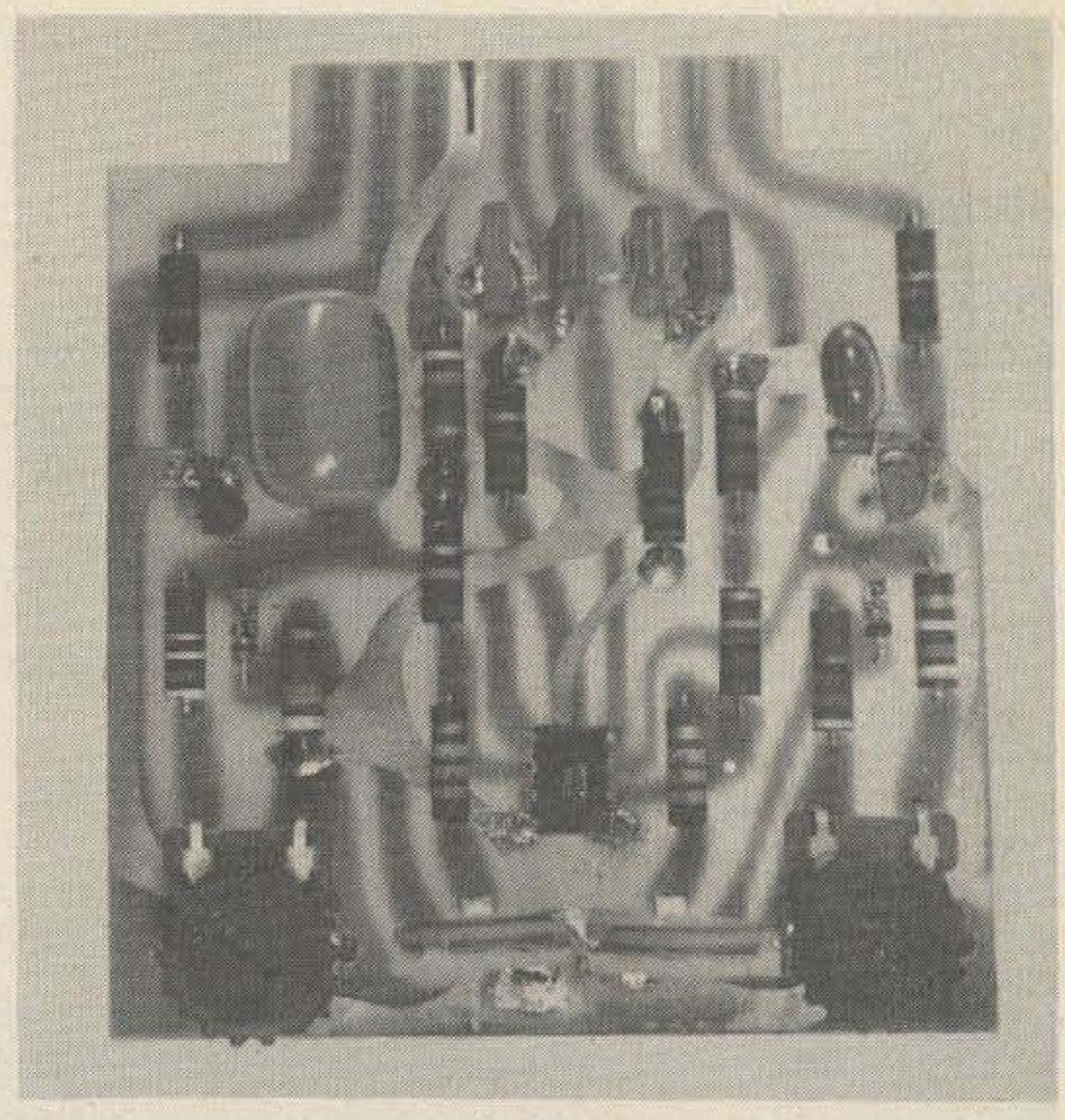
Fig. 3.



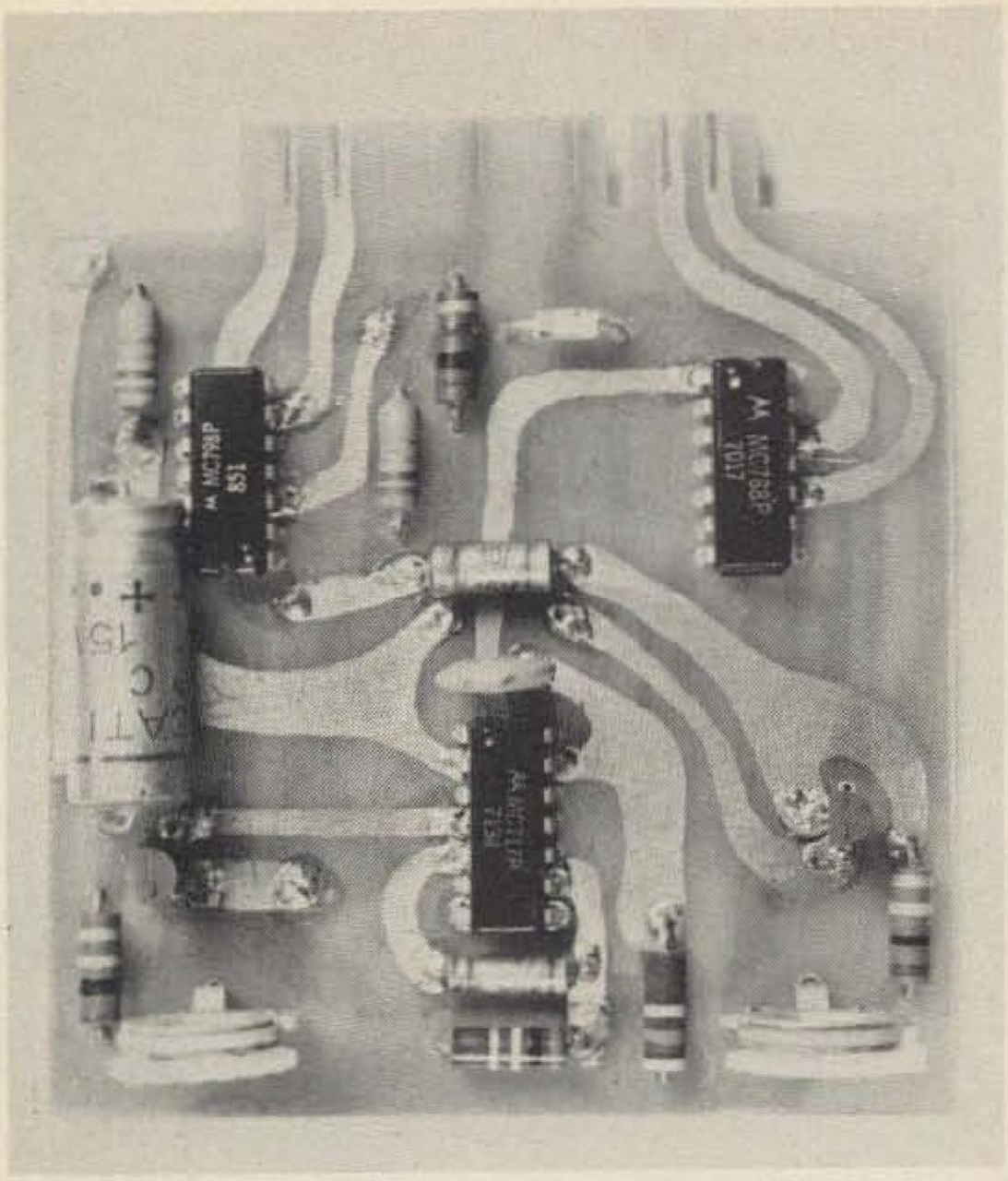
Board #1.

not wobble back and forth, causing damage to both PC boards and plugs. The Plexiglass was cut on a table saw and grooves were also cut so the boards could slip in and out. Then I drilled and tapped the bottom of the holders so I could screw it down onto the chassis.

Well, at this point we have the CRT mounted, all the plugs for the PC boards on the chassis, and the front panel is drilled. Next comes the fabrication of the PC boards.



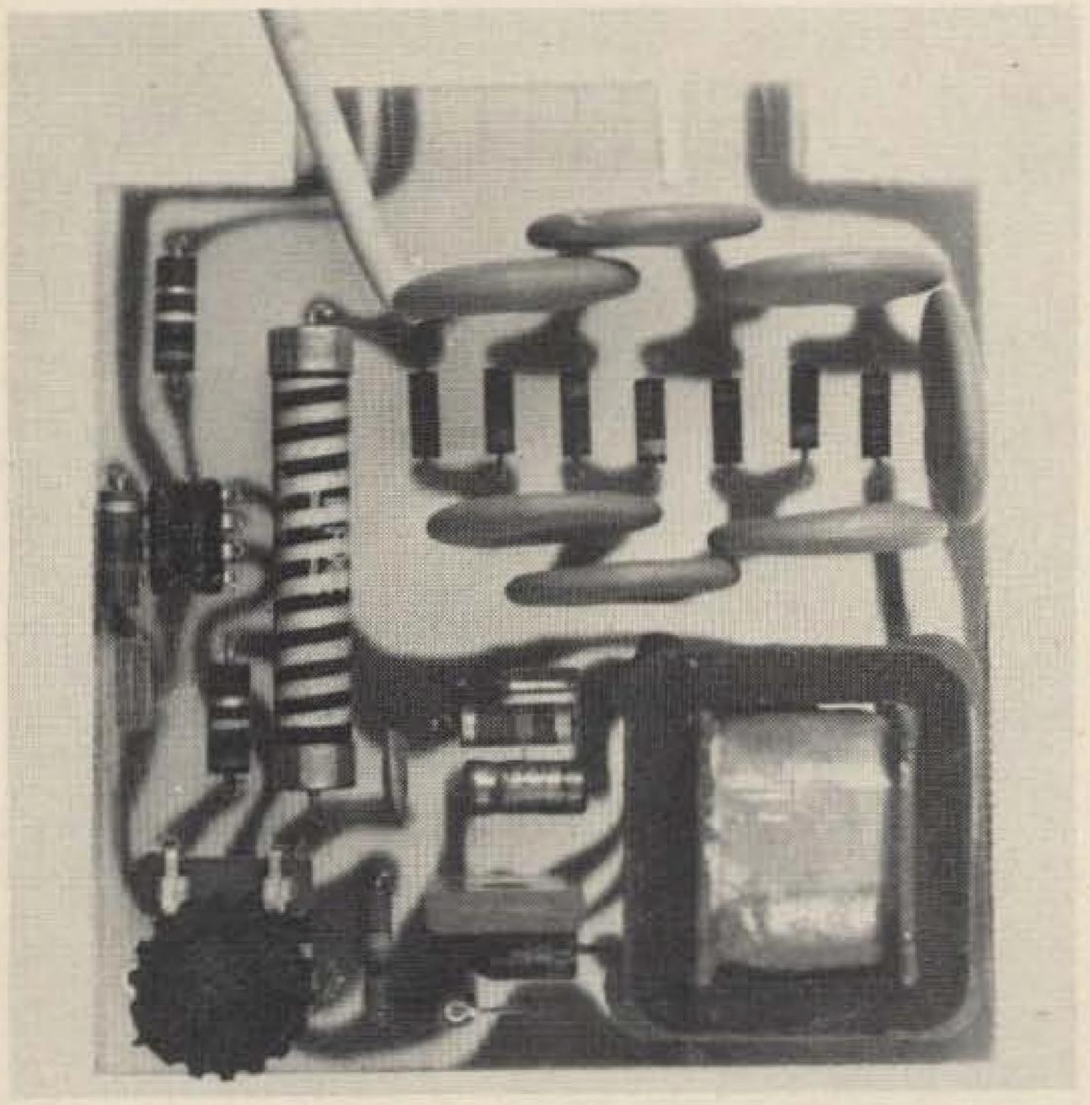
Board #4.



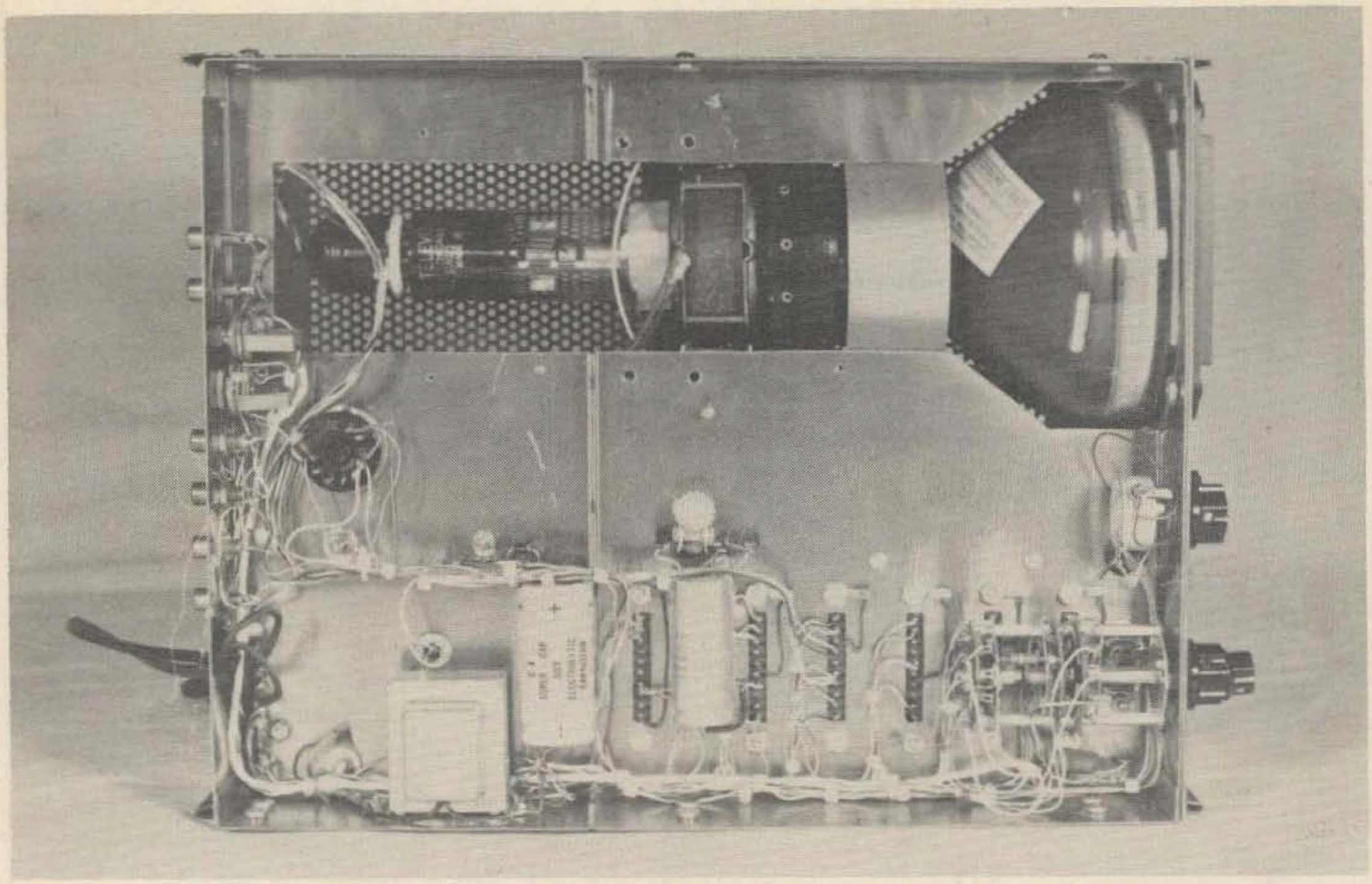
Board #3.

Laying Out The Boards

I'll briefly describe the way I do my boards, since everyone has his own way of doing them. I do my layout four times actual size and use a grid paper that represents 2.54mm (.1") for every square. This lets me see all that room I really have. After the circuit is drawn on the paper I must transfer the drawing to the PC board. I use a pinigraph for this, set for a 4:1 reduction. With a nail or scribe at the end of it I can trace the drawing and at the same



Board #6.



Bottom view.

time scratch in the circuit on the board. (The copper should be clean at this point.) Next I drill all holes to their proper size. I then take a K and E writing pen filled with lacquer paint that has been thinned down, and begin coloring inside the lines. The board is then etched and cleaned. In this monitor it was necessary for me to use 4 double-sided boards and 2 single-sided boards.

The bezel for the CRT front panel is made from Plexiglass. I give most of the credit for that piece to my grandfather. It was cut on a table saw. I first cut the size square I wanted. Next, I lowered the saw blade below the table, then centered the Plexiglass over the blade at the correct distance from the center and edge. With the Plexiglass secure I raised the saw blade up and through the Plexiglass. I did this to all 4 sides, then with a jig saw finished cutting the inside corners out. Using the table saw I was able to get very straight inside and outside edges. The outside corners were cut with a jig saw and rounded smooth with a file. The inside lip of the bezel is just 4 straight pieces cut to fit, then glued in with some liquid glue. The entire bezel was painted flat black.

Touch Ups

The only thing left to do is put on the knobs, lettering, rubber feet, etc., and this I leave to the builder.

As you can see from Fig. 1, it is not an original. It started out as a MXV monitor, but now has MXV, WØLMD, and my own design in it. But like many other serious SSTV builders, when I start on an original circuit, I am bound to deviate from it. Maybe I went too far, but it works very well for me.

Monitor Set Up

(1) Monitor should be set up with a good slow scan signal.

(2) With a VTVM check T.P. 9 for -12V, and T.P. 10 for +12V.

(3) Refer to Fig. 4 for all waveforms.

(4) With scope probe on T.P. 1, waveform A should be present.

(5) The 1K sync control adjusts for the 1200 Hz sync freq. T.P. 2 shows the sync signal B.

(6) Adjust R1 (10K pot) for waveform C.

(7) Adjust R2 (10K pot) for waveform D.