STANDBY PRODUCTION CONSOLE

by Robert V. Tiffany, Chief Engineer, WBBX, Portsmouth, N. H. — An inexpensive system built for auxiliary use.

Recently, the need for a production console arose at our station, but along with the request for this "desperately needed" commodity came the management plea: "Make it good, but don't spend any money."

A little digging through the junk box revealed that everything was on hand except the parts needed to accomplish this miracle. Investigation of catalogs disclosed that to acquire the needed parts without spending any money would either be a revolutionary new business development, or theft. Armed with this evidence, we finally got management to change their plea to: "Don't spend much money." Heartened by this windfall, we sent out a purchase order for a VU meter, two pots with "snap cues," a blank 12″ x 19″ panel, and a 7″ x 9″ chassis.

The next order of business was an entire day spent scouring Boston's endless string of surplus houses. Among the bargains acquired were a husky power transformer of unknown brand, a used UTC A-25 output transformer, a couple of electrolytic capacitors, a 27-volt Zener diode, and some large knobs—clean but not matched.

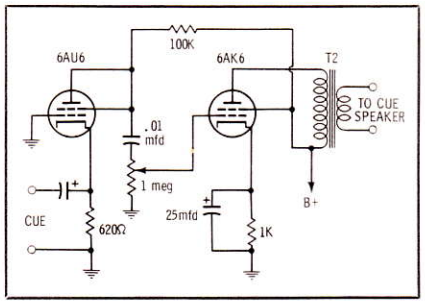

Fig. 3. A diagram of the cue amplifier.

On a rainy Tuesday morning, the postman arrived with the chassis and a few other parts, and the day immediately looked much better. As we worked gingerly along the rear edge of the chassis, something resembling a power supply began to take shape (Fig. 1). Soon we were able to apply power, and the supply worked fine. Now that we could supply all kinds of DC, it seemed we should have something other than a 50-watt resistor for a load.

The output transformer was mounted diagonally opposite the power transformer on the chassis. After a quick pass with a chassis punch, three empty holes stood ready to receive 9-pin sockets (three sounded like about the right number). A conventional output stage (Fig. 2) was installed and checked out. A 12AX7 was chosen for the voltage amplifier because of its ability to make little signals into big ones.

Everything seemed to be falling nicely into place, but suddenly a terrible shadow fell over the new project — there was no input transformer! Everybody knows that the grid of a 12AX7 and the output of a paralleled bunch of 300-ohm pads just aren't compatible. Why not ground the grid and use the pads as the cathode resistor? This may sound like a good idea, but it's not. A resistance of 75 ohms is just too low, even for a 12AX7. A resistance of 500 ohms gave enough bias so the stage operated quite well, and a 100-mfd blocking capacitor kept it that way.

At this point we ran a frequency-response check on the amplifier, and the curve went down like a wounded duck as we passed 6000 cps. A 500-mmf capacitor across the volume control propped the response to about 11 kc, where it started slipping again. We decided to settle for this response in a utility amplifier. The hum, however, was a

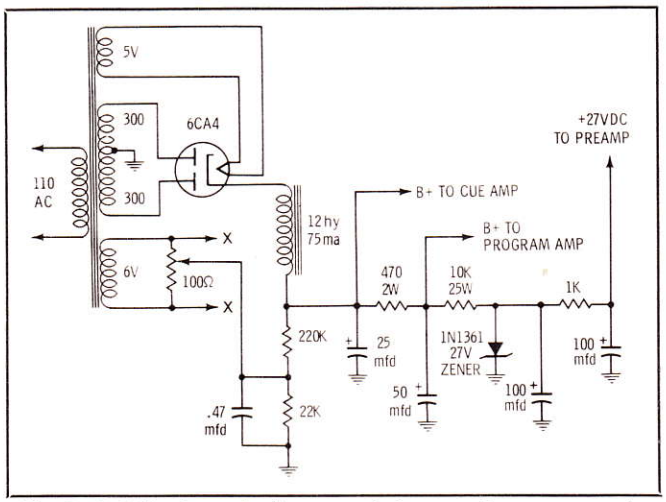

Fig. 1. A full schematic diagram of the console power supply.

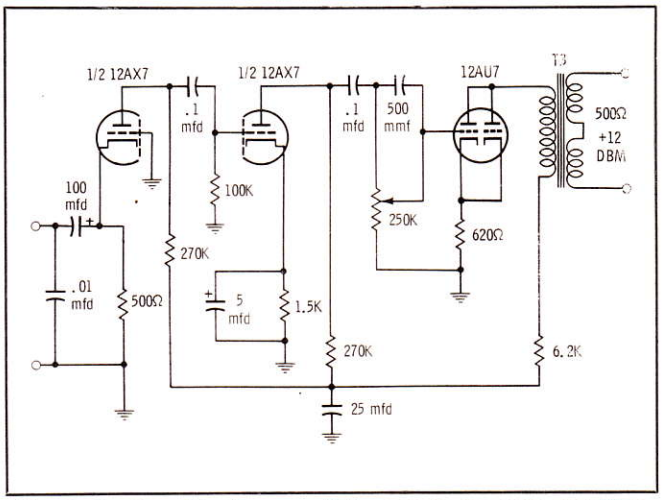

Fig. 2. A schematic diagram of the console program amplifier.

little too much for even this purpose. That was promptly taken care of by a hum balance pot across the filaments.

The cue amplifier (Fig. 3) was the next project. With the same logic used on the program channel, we started at the end and worked backward. An AC-DC type output transformer was teamed up with a 6AK6 for maximum sensitivity. Again the ugly matching problem appeared, but this time we were ready for it. A triode-connected 6AU6 operated with a grounded grid put us in business.

The available turntables had preamplifiers with them, but the microphone was another problem. The hole left vacant in the construction of the program amplifier was filled with an EF86 and its associated components arranged in preamplifier fashion. But alas, it was too close to the output stage, and it left no doubt in our shattered ears that it was unhappy there. We tried several cures before stumbling onto the idea of using a transistor preamplifier (Fig. 4) mounted in a small metal box several feet away from the amplifier.

The only remaining problem was the 12-volt DC supply for the preamplifier. A battery was used for checking but was discarded as a permanent source of power. That shiny bargain Zener diode seemed like a good bet, but it was rated for 27 volts, and we were running out of chassis space to build any more power supplies. There was

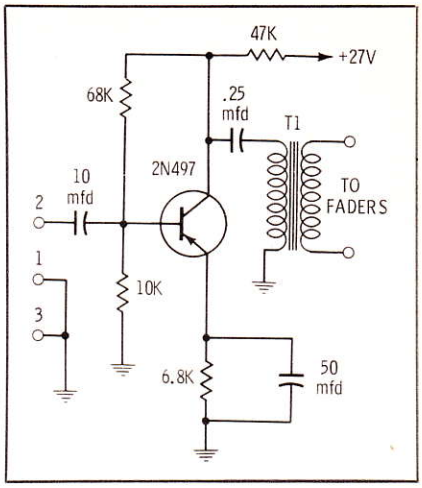

Fig. 4. Diagram of the set's preamplifier.

already a 10K bleeder resistor across the power supply, so we inserted the Zener diode in series with the ground end of the resistor and had 27 volts with almost no ripple. A Pi-section filter removed what little ripple there was, and a little more resistance in the collector circuit of the preamplifier stopped the paint from blistering on the transistor.

A few days were misplaced in the process of hooking the pieces together (Fig. 5), putting on the finishing touches, and connecting the new helpmate to existing equipment; but the entire project took only eight days.

So far everyone is happy with the new facilities, but we have yet to get the reaction of management on the expenditure. Tomorrow we present them with the total bill — $33.49. ▲

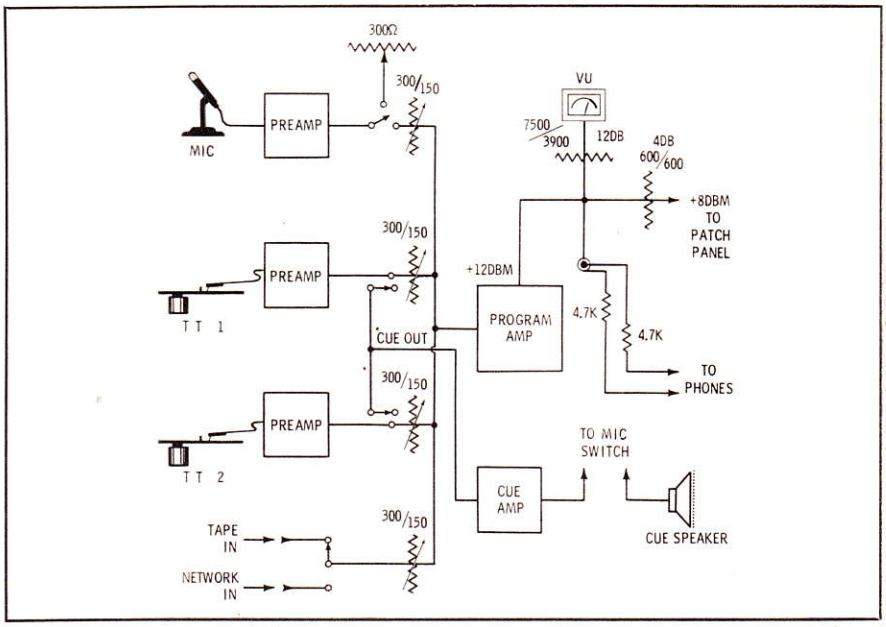

Fig. 5. Complete block diagram of the full auxiliary production system and console.