The Auditioneer

JOHN WHITACRE*

A record and tape playback unit which permits copywriters and others interested in integrating words and music to audition at their desks.

THE MODERN RADIO STATION uses many sound effects, music bridges, background music, and other attention-getting devices to produce commercials and programs.

The copy writing department is charged with the responsibility of putting the right words with the various sound effects or music.

For many years the copy department at WILS needed only a phonograph to play agency commercials and sound effects. Gradually some of the commercials and other programming material began arriving on recording tape. Finally, late in 1959 our engineers built the "Fidelimatic Tape Recording System."[1] Now all the commercials, music bridges, and station identifications are recorded on tape cartridges before being played on the air.

The copy department was being forced to audition most of their material in the auxiliary control room. This not only took them away from their telephone and typewriter, but many times they had to wait their turn to use the equipment. Needless to say, a great deal of valuable time was lost.

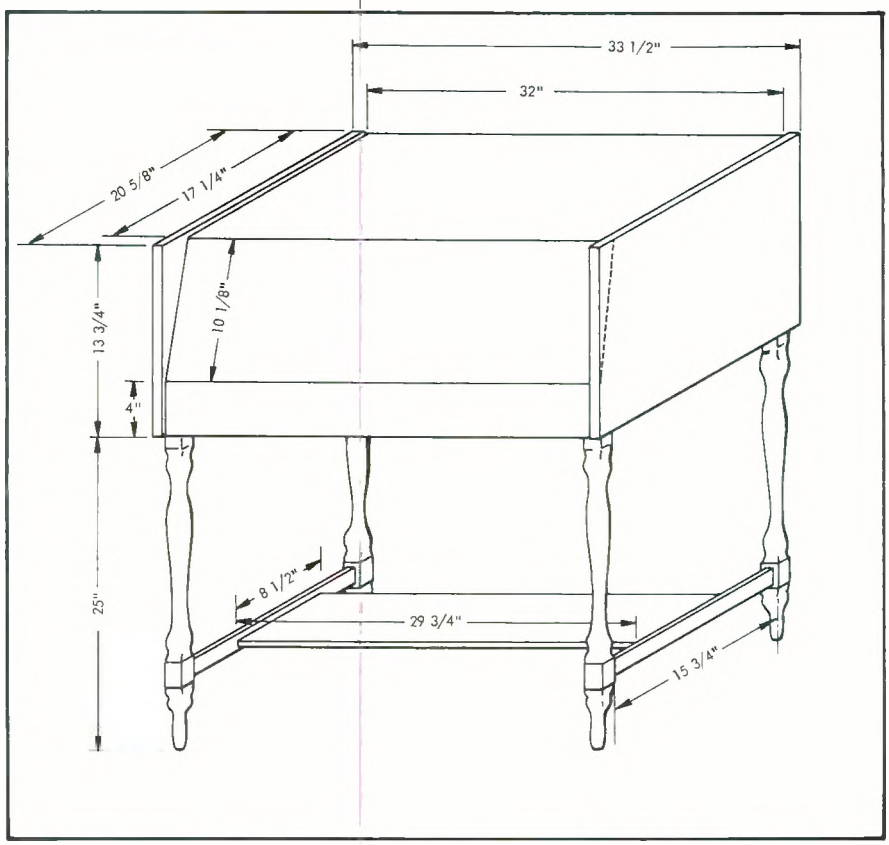

Fig. 2. The wood may be ordered cut to size if you wish to assemble it yourself.

* *2609 Devonshire, Lansing 10, Mich.*

[1] John Whitacre, "The Fidelimatic Tape Recording System," AUDIO, October 1961.

Fig. 1. The completed Auditioneer (on the left).

The Auditioneer you see pictured here (*Fig.* 1) came to fruition as a result of this problem. No longer do they waste time "going to" the equipment. We have brought the equipment "to them."

Conceived and built by the WILS engineering department, the Auditioneer not only does a good job for the copy department, but it pleases the eyes and ears of all who use it.

The Cabinet

The cabinet was difficult to design. It was built so that the user doesn't have to bend over too far when threading tapes on the recorder. At the same time, if the top was made too high it would be troublesome cuing-up records or playing tape cartridges.

Although we were fortunate in having our engineer, Francis Schafer, design and build the cabinet, I believe you could order the wood cut to exact size by a local lumber company and assemble it yourself. If you observe *Fig.* 1 and 2

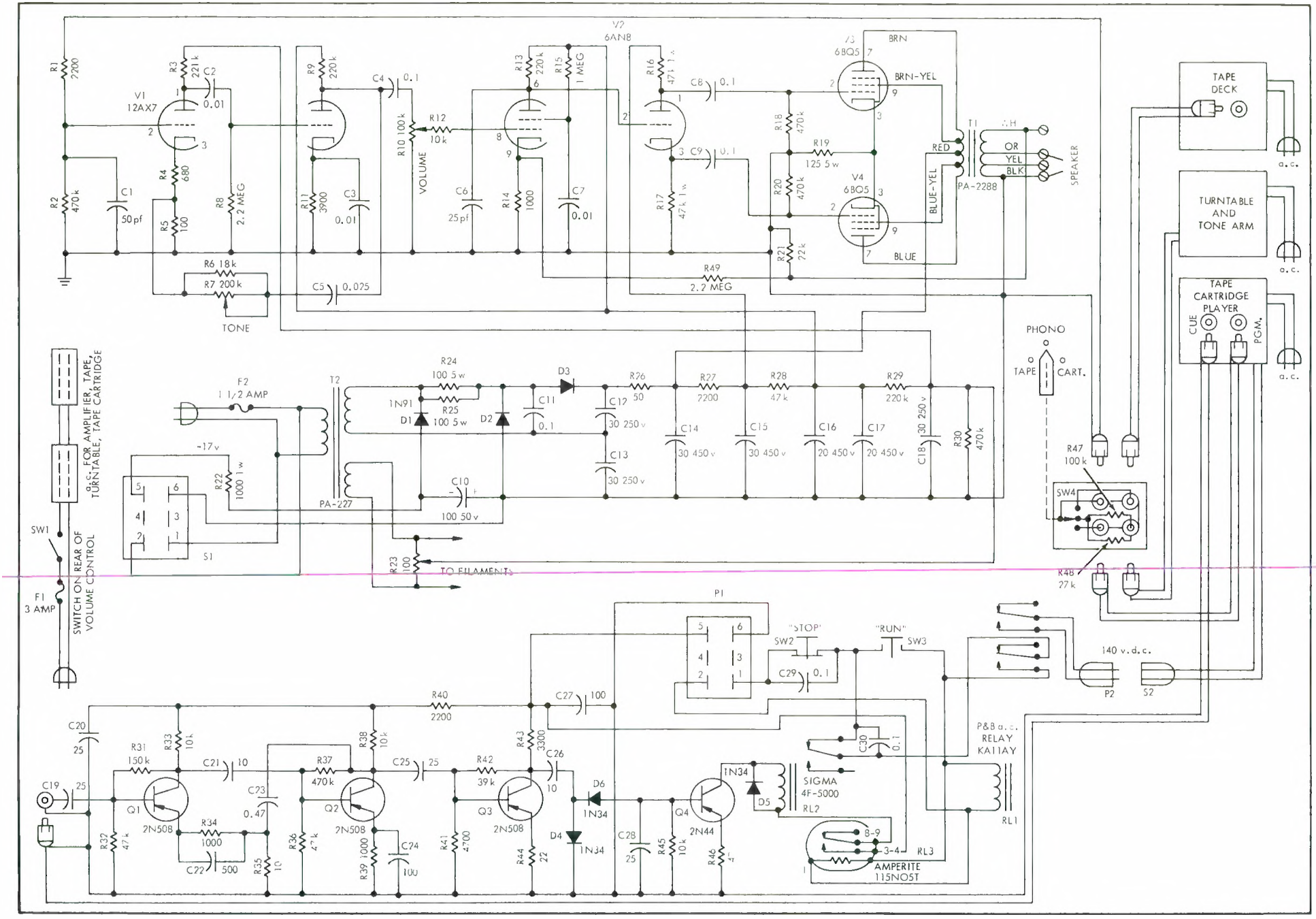

Fig. 3. Schematic of the electronics.

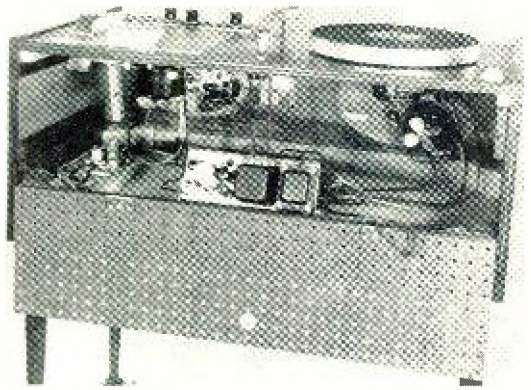

Fig. 4. Back view of the completed unit.

closely you won't have too much difficulty.

American black walnut was selected for the cabinet material. Except for the bottom plate, legs, leg braces, speaker trim, and pegboard, it is constructed of ¾-in. walnut plywood. Clamps, wood blocks, screws, and glue were used to guarantee solid, square, corners. Triangular-shaped wooden blocks are glued firmly against the legs to give them maximum strength. To make the cabinet more sturdy, the legs were joined near the bottom with a solid walnut brace. The two braces are joined together by a piece of walnut plywood. This not only makes the cabinet more rigid, but forms a useful storage shelf. The legs were mitered to accept the braces and the braces were mitered for the shelf. All mitering was done with a wood bit and chisel. The joints so formed were glued in place.

The fine walnut grain is enhanced and protected by two coats of Vitrolene. Vitrolene is a varnish-like wood finish distributed by Minnesota Paints, Inc., of Minneapolis, Minnesota. Although they recommend it for a durable gymnasium floor finish, we have used it quite successfully for some time now to finish cabinets that are likely to be abused.

In a home you probably wouldn't need leg levelers, but in a radio station experience has taught us to put levelers under mobile cabinets. The Auditioneer has been so equipped.

The Equipment

When it was decided to build a complete auditioning unit, one of the very first items salvaged from the old phonograph was the Rek-O-Kut Model LP-743 turntable. It was taken apart, cleaned, lubricated, and reassembled. A new motor starting switch and capacitor were installed.

A Viking Model 75 Tape Deck was taken out of service by a nearby radio station. I purchased it for $20 without even inspecting it. It was disassembled, cleaned, lubricated, and some worn parts replaced. It works very well.

Left over from our earlier experiments with "The Fidelimatic Tape Recording System" was a Viking Model 36 Cartridge Playback deck. Unlike the Model 35 Cartridge deck, it uses a solenoid to hold the pressure roller against the capstan instead of a mechanical latching system. The solenoid feature would make it easy for us to re-cue tape cartridges on this deck. We certainly don't want any cartridges appearing in the control room unless they are cued-up and ready for use on the air!

Viking built the power amplifier we are using in the Auditioneer. It was part of a Viking Model 36. An NAB tape playback equilization network is already incorporated in the amplifier circuit. To get a better bass response from the amplifier when being fed from the three sources, we changed capacitor C_5 from 0.01 μf to 0.025 μf and bridged the tone control, R_7, with an 18,000-ohm resistor (R_G).

The General Electric VR-II cartridge initially used with the Gray transcription arm would over-drive the first stage in the Viking amplifier. A voltage divider consisting of R_{47} and R_{48} dropped the signal appearing at the grid of V_1 to a value equal to that being generated by the tape heads.

Viking of Minneapolis designed the first three stages in our cue-sensing amplifier circuit. We modified it to fit this application. For instance, the tuned feedback loop from the collector of Q_2 to the emitter of Q_1 is designed to roll off most of the higher frequencies.

The Amperite thermal relay, RL_2, is used to delay application of voltage to the collector of Q_4, the triggering or cue-tripping circuit. If this were not done, it would be necessary to hold down on the "Run" switch until all the cue burst had been pulled past the cue-sensing head.

Power for the cue-sensing amplifier and the relay control circuit is taken from the existing power transformer in the power amplifier. This was done by adding one diode, D_1, and two capacitors, C_{10} and C_{27}.

The speaker grill shown in *Fig.* 1 and the two speakers you see in *Fig.* 3 were removed from a used Ampro tape recorder. The small speaker is electrically coupled across the large one through an electrolytic capacitor. It sounded well this way so it was not changed.

A black anodized aluminum panel was engraved with the various controls nomenclature. On this panel are the VOLUME control, TONE control, INPUT switch, ON-OFF indicator, and STOP-START switches for the cartridge mechanism.

Performance

Now, about the fidelity of the AUDITIONEER. First let me point out it was not designed for use as a high-fidelity mechanism. It *was* designed as a "work horse" for the copy department. However, measurements have been made using an Ampex alignment tape on the tape deck and cartridge deck. The speakers were disconnected from the amplifier output and a 5-ohm wirewound resistor was placed across the amplifier output terminals. A number of measurements with a Barker & Williamson distortion meter across the 5-ohm resistor indicated a frequency response of plus or minus 2 db from 50 cps to 10,000 cps. Since an RIAA network is *not* incorporated in the amplifier, it is unfair to expect a good response from the General Electric cartridge. But a slight adjustment of the tone control yields a

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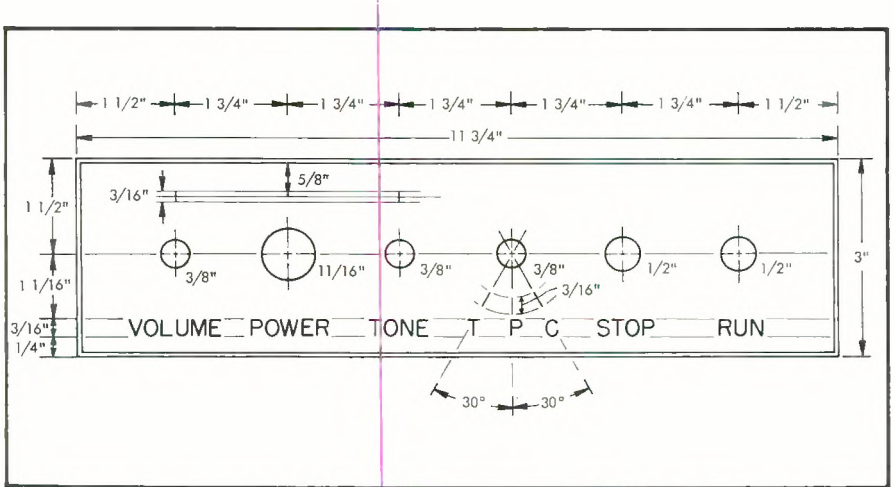

Fig. 5. Lettering and dial calibration marks were engraved in the 1/16-in. thick black-anodized aluminum panel.

very pleasant *listening* response. Naturally if you were building the Auditioneer for high fidelity, you would want to install the RIAA network along with a switch to put it in the circuit when playing records.

This is what the girls in the copy writing department think of the Auditioneer:

We that copy write
No longer have to fight
With the boys who like to light
Out of sight . . .
in auxiliary control

Thanks to the transmitter boys
We have a brand new toy
Life is just pure joy
Since the boys we don't annoy . . .
in auxiliary control

Our feet no longer ache
The earth no longer quakes
No more do we tremble and shake
For temper will never again break . . .
in auxiliary control

Hail to the engineers, one and all
Hail to the men who answered our call
In our esteem, you're ten feet tall
May the boys have a ball . . .
in auxiliary control

Parts List

Resistors

All resistors ½ watt unless otherwise noted

R_1, R_{27}, R_{40}	2200 ohms
R_2, R_{18}, R_{20}, R_{30}, R_{37}	470 k
R_3	221 k (deposited carbon)
R_4	680 ohms
R_5	100 ohms
R_6	18 k
R_7	200 k pot (tone control)
R_8	2.2 Meg.
R_9, R_{13}, R_{29}	220 k
R_{10}	100 k pot (volume control)
R_{11}	3900 ohms
R_{12}, R_{33}, R_{38}, R_{43}	10 k
R_{14}, R_{34}, R_{39}	1000 ohms
R_{15}	1 Meg.
R_{16}, R_{17}, R_{28}	47 k, 1 watt
R_{19}	125 ohms, 5 watt
R_{21}	22 k
R_{22}	1000 ohms, 1 watt
R_{23}	100 ohms pot (hum balance)
R_{24}, R_{25}	100 ohms, 5 watt

R_{26}	50 ohms, 5 watt
R_{31}	150 k
R_{32}, R_{36}	47 k
R_{35}	10 ohms
R_{41}	4700 ohms
R_{42}	39 k
R_{43}	3300 ohms
R_{44}	22 ohms
R_{46}	47 ohms
R_{47}	100 k
R_{48}	27 k
R_{49}	2.2 Meg.

Capacitors

C_1	50 pf disc ceramic
C_2, C_7	0.01 μf/400 volt, tubular
C_3	0.01 μf disc ceramic
C_4, C_8, C_9	0.1 μf/400 volt, tubular
C_5	0.025 μf/400 volt, tubular
C_6	25 pf disc ceramic
C_{10}	100 μf/50 volt, electrolytic
C_{11}	0.1 μf/600 volt tubular
C_{12}, C_{13}, C_{18}	30 μf/250 volt, electrolytic
C_{14}, C_{15} CAN	30 μf/450 volt, electrolytic
C_{16}, C_{17}	20 μf/450 volt, electrolytic
C_{19}, C_{20}, C_{25}, C_{28}	25 μf/25 V. subminiature electrolytic
C_{21}, C_{26}	10 μf/25 V. subminiature electrolytic
C_{27}	100 μf/25 V. subminiature electrolytic
C_{29}, C_{30}	0.1 μf/600 volt, tubular

Miscellaneous

D_1	1N91
D_2, D_3	IR 5A4
D_4, D_5, D_6	1N34
Sw_1	(on volume control)
Sw_2	Grayhill 4002
Sw_3	Grayhill 4001
Sw_4	Centralab PA 1000
F_1	Buss AGC 3
F_2	Buss AGC 1.5
S_1	Jones S-306
S_2	Jones S-302
P_1	Jones P-306
P_2	Jones P-302
Rl_1	P&B KA11AY
Rl_2	Sigma 4F-5000
Rl_3	Amperite 115N05T
V_1	12AX7
V_2	6AN8
V_3, V_4	6BQ5
Q_1, Q_2, Q_3	2N508
Q_4	2N44
T_1	PA228S
T_2	PA227