

An Automatic Disc Recorder

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Time-saving is money-saving—in recording studios as well as elsewhere. The author describes a system whereby considerable time and attention is saved by making an operation partially automatic instead of entirely manual.

THE EQUIPMENT to be described was developed to meet the needs of the recording studio with a great deal of tape-to-disc dubbing work to do. Once the tape playback machine has been started, and the cutter head lowered onto the disc, the operation is almost completely automatic; that is, the program material will be dubbed to the disc with the proper spacing between selections, and both the disc and tape machines are stopped at the end of the program. Control of the disc cutter from the tape is accomplished through small pieces of Scotch tape which have aluminum foil on the outer side. These are stuck in place on the tape by the operator when he edits the tape, and act as miniature shorting bars which operate the appropriate relay on the recorder panel.

The automatic disc recorder is shown in Fig. 1. It is built around a Fairchild 539-G recorder which has been modified as follows:

1. A spiralling motor and overrunning clutch have been added.
2. A dual Micro-switch has been mounted on the left lead screw support so that when the cutter has finished the center spiral it strikes the switch actuator and a relay shuts off the turntable motor, stylus heat, and spiralling motor.
3. Other additions to the Fairchild unit are a suction pump and tube, a

Fig. 1. The control panel mounted adjacent to the disc recorder provides convenient operation.



microscope, and spiralling and micro-groove attachments.

Figure 2 is a diagram of the audio section of the panel. The program material leaves the tape (on an Ampex "400") via a 500-ohm line, goes into the T-pad, through the passive equalizer, to give the proper high-frequency characteristic for microgroove (LP) or standard (78-r.p.m.) recordings, and out into a high-quality 30-watt power amplifier¹. From the output of this amplifier,

which is loaded with a 10-db isolation pad, it comes back to the panel and into the meter switch which sets the recording level at 20 dbm for microgroove and at 26 dbm for standard recordings when the meter indicates 0 VU. This switch also monitors the voltage (approximately 6 volts at 0 VU) across the heater coil in the thermostylus unit. From the switch and VU meter, the signal goes into the 500-cps crossover network (for bass equalization) and the cutter head.

Figure 3 is a wiring diagram of the automatic control section. The indicator lights, PL, are numbered 1, 2, 3, and 4 from right to left when looking at the front of the panel, and are associated with the switches just below them on the panel and correspondingly numbered on the diagram. Terminals AA lead to the heater coil in the thermostylus unit and terminals BB lead to the microscope light. The relays indicated are of the latching type. The 30-watt amplifier, suction pump, turntable motor, and spiralling motor are plugged into the twist-lock receptacles mounted on the rear of the chassis. SW₁ is a push-button switch for manual control of stylus heat. Another push-button switch is used for manual control of separating spiralling if desired. On the octal socket at the left of the diagram, terminals 3 and 7 go to the section of the dual Micro-

¹ Curtiss R. Schafer, "30-watt high-fidelity audio amplifier", *AUDIO ENGINEERING*, July 1948, p. 21.

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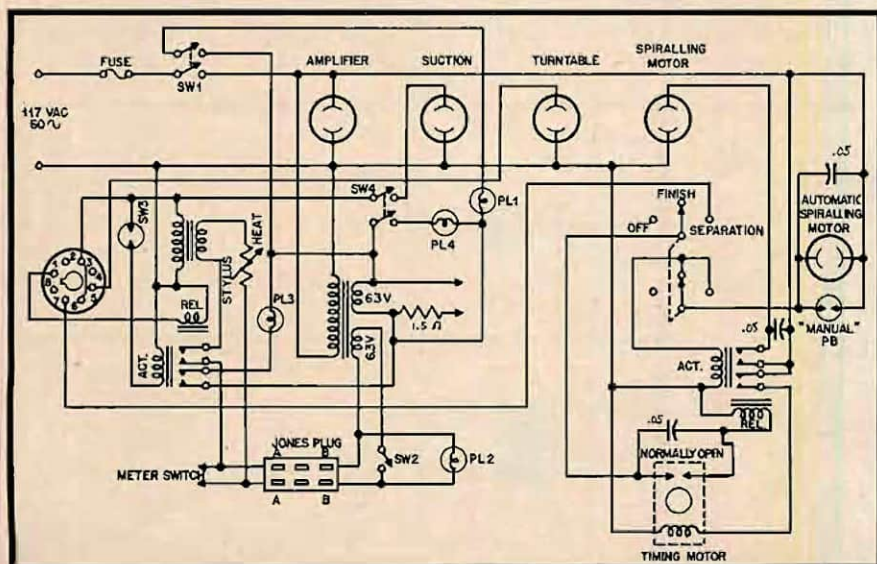


Fig. 3. Complete schematic of the power and signal circuits for operation of the disc recorder and its accessories.

DISC RECORD

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switch that is closed at the start of a recording; terminals 1 and 3 to the Micro-switch that is closed at the end of the recording; terminals 5 and 6 go to a toggle switch on the recorder base for manual control of the turntable motor.

The operating sequence is as follows:

1. Put on blank disc and screw down conical aluminum clamping nut.
2. Connect tape recorder to AUTOMATIC SPIRALLING CONTROLS plug.
3. Turn on a.c. power to both recorders.
4. Put edited tape on Ampex; set controls for playback.
5. Turn on suction pump.
6. With meter switch on HEAT, press stylus switch and set heat adjusting rheostat so that meter indicates 0 VU. Then set meter switch at microgroove or standard, as required. Set equalization and gain controls also.
7. Turn turntable switch on.
8. Turn microscope lamp switch on.
9. Lower cutter head to record and check groove with microscope.
11. Cut a run-in spiral by depressing MANUAL push-button (to get a lead-in groove for record changer operation).
10. Set spiralling selector at SEPARATION.
12. Start tape.

The recording is now being dubbed. This continues until a foil strip closes the contacts on the automatic spiralling control. When this occurs, a spiral groove is cut for about 3/32 in. (measured radially) and then the recording of the next selection on the tape starts. At the end of this selection, another foil marker again starts the spiralling motor, and the cycle is repeated until the last selection is being cut.

The operator may now remove the finished record, put on another blank, and start the cycle once more. The equipment described enables the average good operator to take care of about twelve recording set-ups simultaneously, instead of the usual two or three.

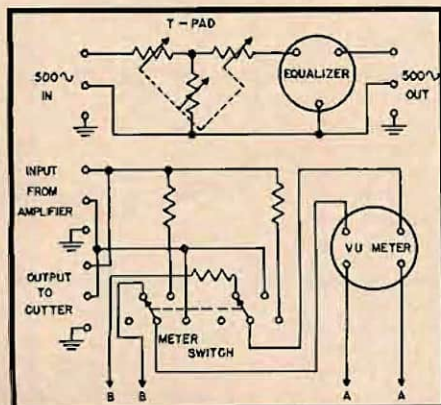


Fig. 2. The audio section of the control panel, in schematic form.

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