

Radio Set and Service Review

Eicor Model 1000 Tape Recorder



EICOR'S model 1000 tape recorder (Eicor, Inc., Chicago), one of the lowest-priced sound recorders of any kind, performs at least as well and is as easy to handle as any home-type unit offered today in its price range. All of which indicates that the service technician may soon find the Eicor in the hands of many of his customers.

The appearance of the recorder is unusually neat. The black leatherette case is 14 1/4 inches wide, 8 3/4 inches high (with the lid down), and 11 1/4 inches from back to front. Three pockets are provided in the cover for the microphone and the cables. The whole unit weighs 27 pounds.

Operation is extremely simple. A reel of tape is placed on the left post; the tape is brought around the bottom of the head, over the top of the rubber-rimmed capstan, and threaded onto an empty reel on the right post. The center knob is the ON-OFF-VOLUME control. The left control sends the tape forward

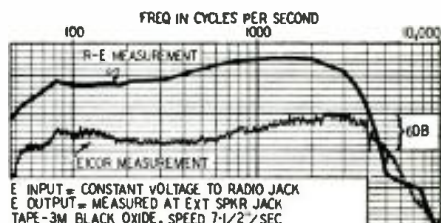
or backward, or stops it. The knob at the right switches the circuit to ERASE-RECORD or LISTEN.

To rewind the tape, it is lifted off the capstan and passed across the head only. It is not always necessary to rewind, however, as the unit has a "twin-track" feature. Recordings are made on the top half of the tape. When a reel is fully recorded, the full reel can be removed from the right post, inverted, and placed on the left post; a new recording can be made on the unused half. The metal roller shown just below the capstan in the photo was apparently added in later production; it is not shown or discussed in the instruction book. If, in rewinding, the tape is passed from the right reel, directly across the bottom of the magnetic head, to the left reel, no sound will be heard. If, however, it is looped over this metal roller before reaching the head, the high-pitched "Donald Duck" sound of the recording will be heard on rewind, a valuable feature if the tape is to be rolled back only to the beginning of a certain selection. Rewind time for a full 15-minute reel is 2 minutes; a half-hour reel requires 4 minutes.

The audio quality of this recorder was judged on test to be acceptable. Jacks are provided for an external 3.2-

ohm speaker and for signal feeds from an external source such as an AM radio, FM tuner, program line, PA system, etc. The built-in speaker is 6 inches in diameter—a bit larger than usual in this type of equipment.

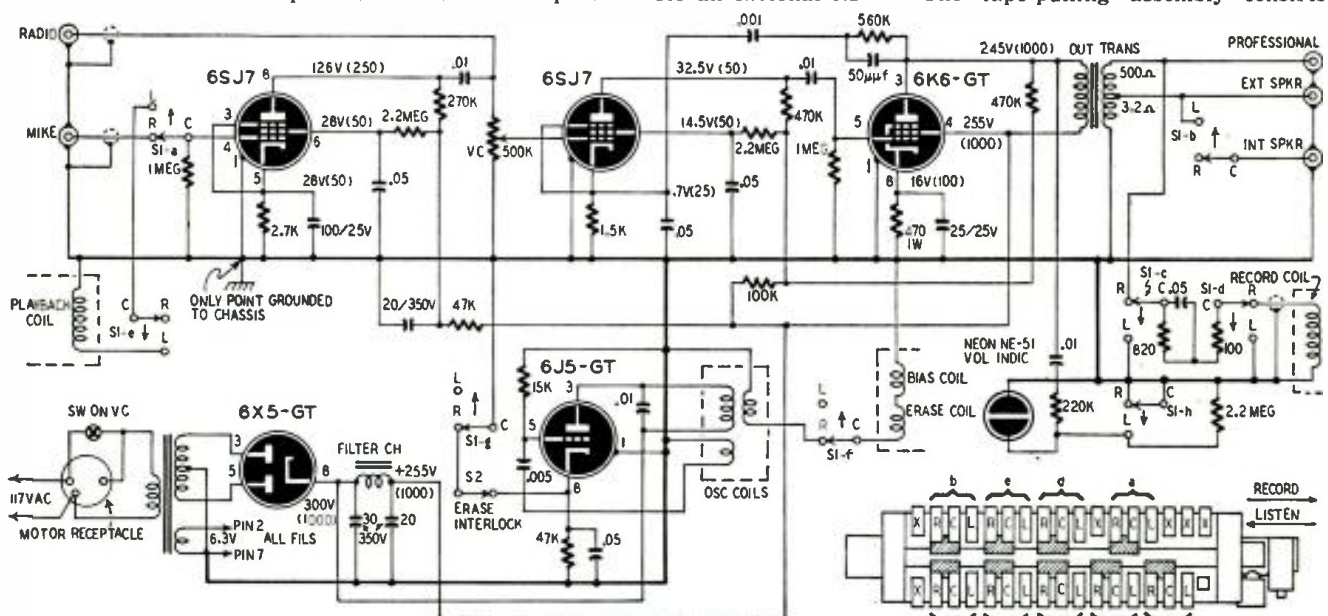
No tone controls are provided for the operator. A typical response curve supplied by the manufacturer shows that the output on playback, with a constant-level, varied-frequency tone



Frequency-response curves for recorder.

input while recording, stays within ± 3 db between about 50 and 5,000 cycles. Above the machine-run curve appears the result of a response check made in our own laboratory at a somewhat higher signal level. Wow and flutter in this recorder were extremely low.

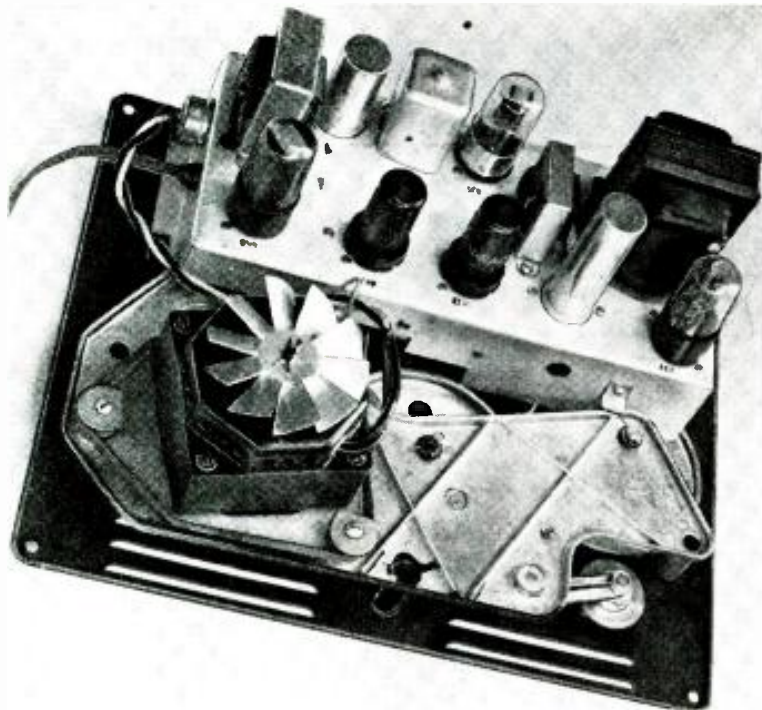
The tape-pulling assembly consists



VOLTAGES MEASURED ON 20,000Ω PER VOLT METER SET TO RANGES INDICATED IN PARENTHESES THUS (1000)

SI: a-h SWITCH SECTIONS NU-NOT USED X-TIE POINTS
R-RECORD C-COMMON L-LISTEN

Complete amplifier schematic. Apparently the single-point ground is largely responsible for the complete absence of hum.



This upside-down view of the motorboard shows the amplifier chassis.

of a synchronous motor and a simple combination belt and friction drive, mounted solidly to the heavy metal motorboard. The motor runs at all times (when the switch on the volume control is turned on); the reels are started and stopped by a mechanical clutch arrangement operated by the FORWARD-OFF-REWIND knob on the left.

The chassis is screwed upside down to the motorboard. Plugs connect the internal speaker and the motor to it. The magnetic head is wired directly to the chassis and mechanically connected by a semirigid, copper bonding strip. Four screws atop the motorboard hold the chassis, but in disassembling for servicing remember to remove the two

screws holding the magnetic head to the motorboard, too.

The schematic shown was redrawn from that given in the 24-page instruction book supplied with the recorder. In the drawing in the book the components are so arranged as to duplicate their physical placement on the chassis. Since most technicians try to diagnose trouble in terms of the symptoms, the functional drawing shown here is likely to be much more useful.

The manufacturer's drawing has one very interesting feature, however. Circuit grounds are shown to be made at unexpected points and contact is made to the chassis at only one place—pin 2 of the first 6SJ7. Since there is no other

hum-reducing device apparent in the circuit, these peculiar ground connections are probably responsible for the phenomenally low hum in the loudspeaker. On both recording and playback, the volume control can be opened wide; with the ear right up against the speaker, the only hum to be heard is the slight whine of the motor.

The RECORD-LISTEN switch S1 (our numbering) is a multiple-contact slide unit attached to the chassis and actuated by a rod topped with a knob on the motorboard. It has been broken down in the drawing into separate s.p.d.t. sections for simplicity; the sections are lettered and identified on the inset drawing of the actual switch.

The four magnetic coils are all in the one head. Either playback coil or microphone is switched to the grid of the 6SJ7. The RADIO input is paralleled with the plate of this tube across the volume control. The 6K6-GT is the power amplifier, feeding either speakers or the record coil (the latter through an equalizer network). Note the provisions for attaching external 3.2- or 500-ohm speakers or lines. A 6J5-GT oscillator provides erase and bias signals.

There are four frequency-compensation networks in the amplifier. The series 560,000-ohm resistor and .001- μ f capacitor between the plate of the 6K6-GT and the cathode of the previous tube feed back (and therefore roll off) highs, beginning at about 250 cycles. The apparent effect is a bass boost from 250 down. The 50- μ f capacitor across the 560,000-ohm resistor increases the treble cut, beginning at approximately 7,000 cycles, beyond the useful range of the recorder.

The .05- μ f capacitor across the 1,500-ohm cathode resistor of the second 6SJ7 reduces degeneration of highs beginning at about 2,000 cycles. This is, of course, a high-boost circuit. The parallel 820-ohm resistor and .05- μ f capacitor in series with the record coil boost highs beginning at about 4,000 cycles. This has very little effect and is the only one of the compensators not in the circuit at all times.

The functions of the switch sections are obvious, with the exception of S2. With the cathode of the 6J5-GT grounded only through its cathode resistor and capacitor, the bias prevents oscillation. S2 is a leaf-type interlock switch, which closes only when the mechanical clutch arrangement is in the FORWARD position. This prevents erasure when the tape is being rewound, even though S1 may be on ERASE-RECORD. When S2 is closed and S1 on ERASE-RECORD, the 6J5-GT cathode is grounded directly and the oscillator operates.

S1 is, not a stock unit, but a special slide switch built for the purpose. The technician should take great care, in adjusting any of the contacts, not to misalign them. The operation has been carefully timed—certain sections break quickly, others slowly, and some are of the shorting type. The sequence of contacts is also worked out in a specific order. So beware of tampering.

Service Technician's Information Blank

See Editorial on page 19 for vital information to you.

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