

Equipment Profiles (continued)

TEAC Model A-4010S Stereo Tape Deck



MANUFACTURER'S SPECIFICATIONS—

Tape speeds: $7\frac{1}{2}$ & $3\frac{3}{4}$ ips. Motors: 2 outer-rotor types for reel drive; 1 hysteresis-synchronous for capstan drive. Reel size: 7" max. Heads: Four; 4-track stereo, erase, forward record, forward playback, and reverse playback. Wow & flutter: 0.12% at $7\frac{1}{2}$ ips; 0.15% at $3\frac{3}{4}$ ips. Freq. Resp.: 30-20,000 Hz at $7\frac{1}{2}$ (50-15,000 \pm 3 dB); 40-12,000 at $3\frac{3}{4}$ (50-7500 \pm 3 dB). S/N: 50 dB. Crosstalk: 50 dB channel-to-channel at 1000 Hz; 40 dB between adjacent tracks at 100 Hz. Inputs: Microphone, 10,000 ohms, 0.25 mV min.; Line, 100,000 ohms, 0.14 V min. Output, 1.0 V for load impedance of 10,000 ohms or more. Dimensions: $17\frac{3}{8}$ " W x $17\text{-}7/16$ " H x $8\frac{1}{2}$ " D. Weight: 44 lbs. Price: \$469.50.

The TEAC A-4010S is a combination of the A-4000S tape player and the RA-40S recording amplifier. The player/transport is $11\frac{1}{2}$ in. high, and the recording amplifier is 4 in. high. Both are mounted together in a single, attractive wooden cabinet to provide

both recording and playback operation in a single unit. The machine is capable of recording and playing in the forward direction, but only of playing in the reverse direction. Reversing is automatic when a metallic tape is applied to the back of the tape at the point where reversing is desired.

The A-4010S is push-button operated, and the various actions are initiated by relays—seven in all—which provide the various functions. The front view, Fig. 1, shows the two units in place—the lower section being the recording amplifier. The playback amplifier is located under the right spooling motor, shown at the left of Fig. 2. When used as a tape player only, the output is at a fixed level, with speed equalization being controlled by the speed switch.

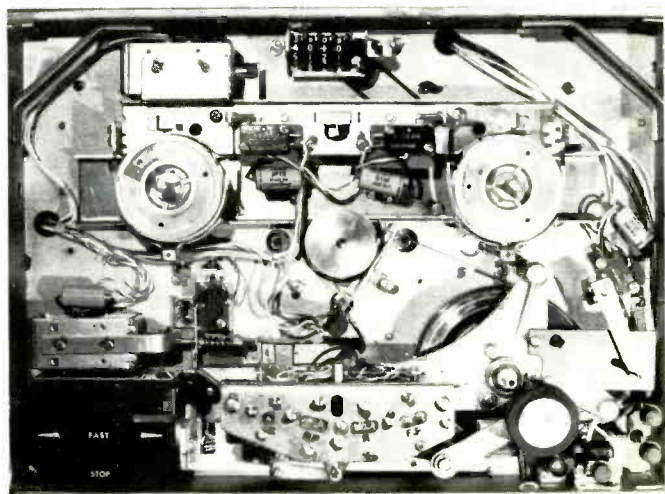
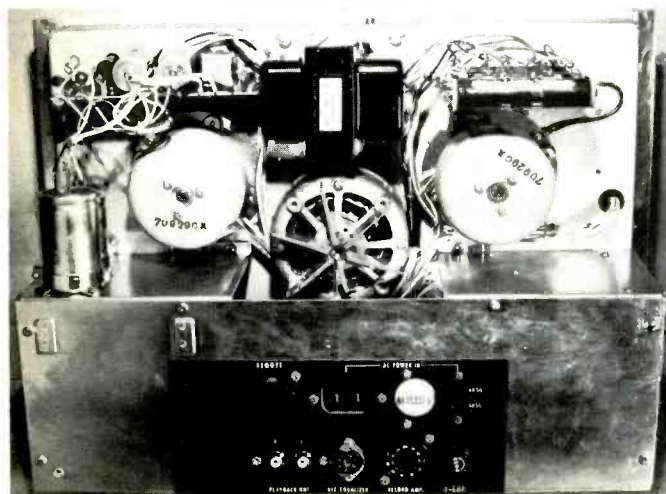
With the record amplifier being used, the two units are connected by two single shielded cables for the playback output, and by two cables consisting of six and eight leads respectively—the

first provides for switching the record equalization, and the second connects to the record heads with the recording signal, and provides for bias and erase connections, as well as a.c. power to the amplifier. Figure 2 also shows the rear of the tape player section only. Also available on the back panel are: a socket for remote control which can be used to stop the tape motion; or to start it in either direction; a male receptacle for the a.c. line cord; the line-voltage selector and frequency selector switches, two fuses—one for the transport and one for the record amplifier; and a standard DIN socket for connecting to an amplifier so equipped. The use of this connection, however, eliminates the ability to mix high-level and microphone signals in recording.

The front panel of the recorder/transport, Fig. 1, accommodates the two reel hubs, each with ridged rubber rings to provide better contact with the reels. Above them at the center of the panel is a four-digit counter with a push-button reset, while below the reels and also centered is a switch button to control tape tension. In the depressed position, tape tension is decreased for use with $\frac{1}{2}$ -mil tapes. At the left are four rectangular push-button switches marked FAST and STOP. These buttons energize the necessary relays and solenoids for operation of the transport. Above them is a tape-tension lever, followed by the reversing contacts—a pair of metal rods imbedded in the tape guide. To their right is the tape-head cover, which houses the four heads, shown with the cover removed in Fig. 3, a photo of the entire unit with the front panel removed. Further to the right are the capstan, pressure roller, power switch and indicator light, and the two buttons for changing

Fig. 2—Three motors of the TEAC A-4010S deck are seen with the back panel removed.

Fig. 3—Here is a view of the recorder with the top panel removed.



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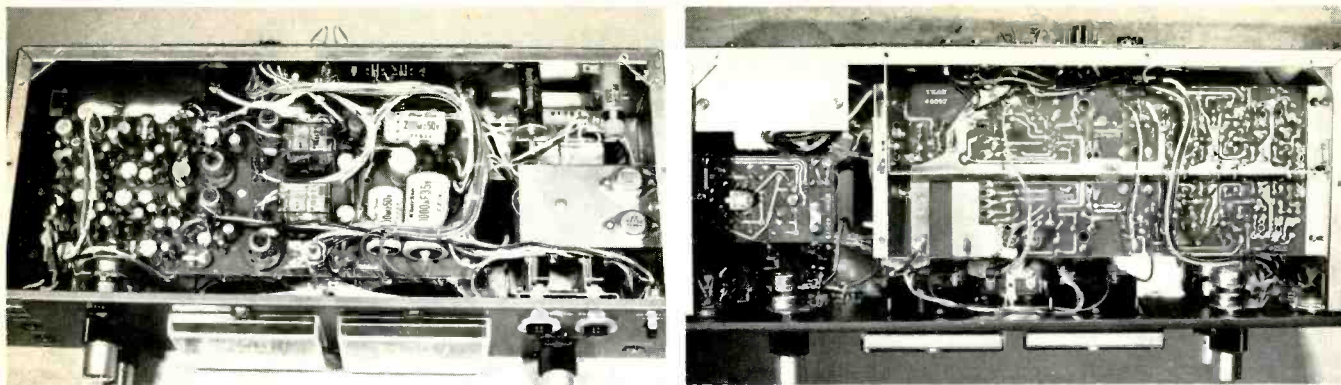


Fig. 4—Top and bottom views of the TEAC A-4010S's recording amplifier.

speeds. Above is the automatic shut-off lever, which actuates a microswitch to turn off power when tape runs out.

On the recording amplifier panel at the left are the two microphone input jacks, followed by two dual-concentric record-level controls, one for microphone input and one for line input. Next are the two big $4\frac{1}{2}$ -in. VU meters, with the record indicators above each. These are followed by two RECORD push-buttons, one for each channel, the monitor switch to select monitoring and output from either source or tape, a dual-concentric playback level control, and a headphone jack.

Speed change operates by electrical switching of the windings in the capstan motor. Fifty to 60 cycle power lines can be accommodated by moving the drive belt (between motor and flywheel) from one step on the motor pulley to the other. Figure 4 shows the top and bottom views of the recording amplifier. The playback amplifier consists of two identical sections, each employing two transistor feedback pairs plus another transistor as a voltage regulator. In the recording amplifier, there are two 4-transistor amplifier sections for the record function, a push-pull bias/erase oscillator operating at 108 kHz (in our test sample), a solid-state regulator stage, the playback level controls, and two 2-transistor amplifiers which provide additional gain to drive the VU meters from an adjustable potentiometer in the record amplifiers, and to provide for switching monitoring and output from tape to source.

Operation

The A-4010S is an exceptionally easy machine to operate. It is easy to thread, and is apparently foolproof. It is difficult to move fast enough to cause the tape to break by improper operation of the transport buttons. The record interlock indicators are neon lamps which are fed with the output of the bias oscil-

lator, so if the lights are on, you know that your bias oscillator is working. Microphone input jacks are terminated if no microphone is plugged in, and mixing of microphone and line is done after the microphone preamplifier stage. An adjustment is provided for balancing the oscillator for optimum symmetry (and consequent minimum of tape noise).

The transport is provided with adjustable wire-wound resistors—seem to be about 50-W. types—for setting up the proper voltages for the several functions of the reel motors. Functions are normal wind for recording, fast wind, and holdback—which for two-direction operation is a most desirable feature, and entirely unexpected in a machine designed for home use. All three motors have their series phase-shifting capacitors switched when the speed is changed, and all switches are shunted with click suppressors. On the whole, the machine is equipped with practically every convenience that could be wanted, even if it will not record in the reverse direction.

The weight of the machine should, by itself, indicate the sturdiness of construction and the completeness of the overall design. There are seven relays and two solenoids in the unit, together

with 24 transistors and 8 diodes, with all the transistors being germanium PNP types except those in the bias oscillator circuit, which are NPNs.

Performance

In the performance category, the A-4010S passes with flying colors, exceeding its specifications appreciably. Frequency response at $7\frac{1}{2}$ ips measured within ± 3 dB from 35 to 19,000 Hz, using Scotch 202 as the recording medium, and without readjusting bias or disturbing the factory settings of equalization nor realigning the azimuth of the playback heads. At $3\frac{3}{4}$ ips, the frequency response extended from 32 to 12,000 Hz ± 3 dB. Wow and flutter measured .07% at $7\frac{1}{2}$ ips, and 0.11% at $3\frac{3}{4}$, both figures being better than specs. Winding time measured 70 secs. for a 1200-ft. reel, as against 90 secs. in the specs. Signal-to-noise was a creditable 56 dB at $7\frac{1}{2}$, and 44 dB at $3\frac{3}{4}$ ips, and channel separation was 49 dB at 1000 Hz on both stereo and mono. Separation between adjacent tracks—important with a reverse-play machine—measured 47 dB. Record/play distortion measured 0.6% at -10 dB with respect to the 0 on the meters, and the 3% point occurred at a level 8 dB above the indicated 0 level on the meters. The frequency response curves for both playback from standard tape and the record/play response are shown in Figs. 5 and 6. The input required for a 0 level on mike input was measured at 0.1 mV, and for line input it was a modest .07 V, which is 6 dB below specifications.

On the whole, the TEAC A-4010S stacks up as a fine machine—one which is easy to handle, excellent in performance, and a unit which is able to complement any fine stereo hi-fi system. For those who want a 2-track recorder, such a model is available.

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Fig. 5—TEAC playback response to standard recording tape.

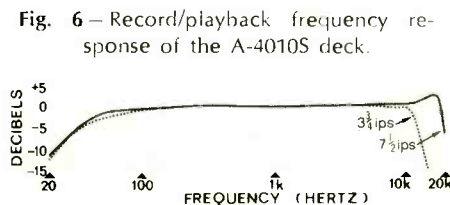


Fig. 6—Record/playback frequency response of the A-4010S deck.