

## TEAC A-7030U Stereo Tape Deck

### MANUFACTURER'S SPECIFICATIONS:

**Speeds:** Two, 15 and 7½ ips. **Heads:** Four; two-track erase, record, and playback, and four-track playback. **Reel Size:** 10½" max. **Motors:** Three; dual-speed hysteresis synchronous for capstan drive, two eddy-current for reel turntables. **Wow and Flutter:** 15 ips, .05%; 7½ ips, .08%. **Signal-to-Noise Ratio:** 58 dB (2-track); 55 dB (4-track). **Crosstalk:** 40 dB at 1000 Hz. **Frequency Response:** 15 ips, 40 to 20,000 Hz ± 2 dB; 7½ ips, 50 to 15,000 Hz ± 2 dB. **Inputs:** Microphone, 10,000 ohms, 0.5 mV min.; line, 300,000 ohms, 0.1 V min. **Output:** Approximately 1 V for a load impedance of 100,000 ohms or more. **Fast Winding Time:** Approximately 200 sec. for 2400 ft. of tape. **Dimensions:** 20¾" high, 17¾" wide, 8-1/16" deep, (10" over knobs). **Weight:** 62 lbs. **Price:** \$749.50.

This is the first tape deck with the 15-7½-ips speed combination we have been privileged to examine in a long time, and it is a delightful machine to operate. The control is by relays and solenoids, which makes it possible to add a remote-control accessory when desired, and for special applications such as language laboratories, another accessory—a remote pause control—is available.

The A-7030U accommodates 10½ reels, as well as any smaller sizes one wishes to use. It is basically a two-track machine, but has the additional four-track head for playing tapes recorded with this configuration—which naturally includes most pre-recorded tapes.

The unit has the usual arrangement with the reels at the top, the operating controls in the lower portion of the transport section, the amplifier is in a separate chassis mounted in the same cabinet as the transport.

The operating controls along the lower portion of the transport are: the power switch, with a pilot light above it, followed by the tape-speed switch, the reel-size switch, the two track/four track switch, all of which are push-push buttons, and the CUE button, a momentary switch. To the right are three short bars controlling tape motion—REWIND, FAST FORWARD, and PLAY, with a long STOP bar underneath them. At the right edge of the panel are the RECORD button, with the RECORD pilot light above it. The head assembly is above the push-push switches, and the counter, driven by a belt from the supply reel, is to its left. Above the counter is a stabilizer roller with a compliance arm alongside, the latter

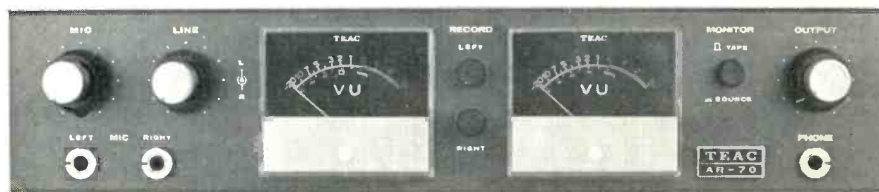


Fig. 1—Front view of amplifier section.

with a sensing post over which the tape is threaded. The stabilizer roller is fitted with a 1¼-lb. flywheel to iron out any variations in tape feed from the supply reel. The sensing post is designed to work with a piece of aluminum foil on the back of the tape, and as the foil passes the post, the machine will either do nothing, stop, or rewind the tape and then stop, depending on the setting of a switch on the rear panel of the deck. To the right of the head assembly is the capstan—of massive dimensions, since it measures 0.475 in. in diameter. Above it is the pinch roller, and to its right is the automatic shut-off lever.

Holding the reels in place are two large reel clamps which accommodate NAB 10½-in. reels, and which lock in place with a slight turn of the knob.

For 7-in. and smaller reels, rubber slip-on reel holders are provided. In addition to the stabilizing roller, there is also a scrape-flutter roller between the record and play heads, as well as tape-lifters which are retracted in the fast-wind positions when the CUE button is depressed.

The amplifier section, shown in Fig. 1, has two phone jacks for left and right microphone inputs under the record-level controls—the left pair controlling microphone levels and the right pair for the line inputs, which may be mixed together for recording. The controls are dual-concentric types, with the anodized aluminum front knobs controlling the left channel, while the larger black plastic knobs are for the right channel. Next are the two 4½-

in -VU meters, illuminated whenever power is on. Between them are two more push-push switches which control which channel is recording. To the right of the meters is another push-push button which selects source or tape monitoring, followed by the output level control, also a dual-concentric type. Below this is a stereo phone jack.

The amplifier and the transport assembly are connected electrically by two cables, each with octal plugs, and by two separate play-head cables plugged into phone jacks on both amplifier and transport. The remote control accessory requires a 11-pin plug, while the pause control uses a 6-pin DIN plug, with only three wires. Actuation of the pause control in the accessory releases the brake and capstan solenoids, stopping the tape motion. In addition to the interconnecting cables, there is a ground strap between the two sections.

### Amplifier Circuitry

The amplifiers are relatively straightforward in design, with conventional solid-state circuitry. Each play amplifier consists of a three-transistor pre-amplifier section, ending in an emitter follower, with feedback from its emitter to the emitter of the first transistor, switched by a relay as the speed-change button is actuated. The preamp is followed by a twin-T filter, followed by the TAPE-SOURCE switch and the output-level control. This feeds a two-transistor amplifier which provides the necessary gain to supply the output signal and also drives the meter amplifier—a single transistor—which is also switched from tape to source. Adjustable resistors serve to balance the indications between the two signals. In addition to feeding the meter amplifier, the amplifier also feeds another transistor which is a transformer coupled to the phone jack to permit use of conventional low-impedance headphones. A bias trap across the output terminals eliminates any residual bias from the amplifier.

The record amplifier consists of a microphone preamp stage followed by the mic volume control, which is paralleled by the line input volume control. Both are adjusted to similar outputs by variable resistors. The mixing controls then feed a two-transistor feedback pair with some high-frequency equalization, and the output drives the recording output stage, a single transistor with resonant circuits across part of its emitter resistor to provide the required high-frequency peaking. The output from the collector feeds the record head through another bias trap, with bias being adjusted by a variable resistor. In the

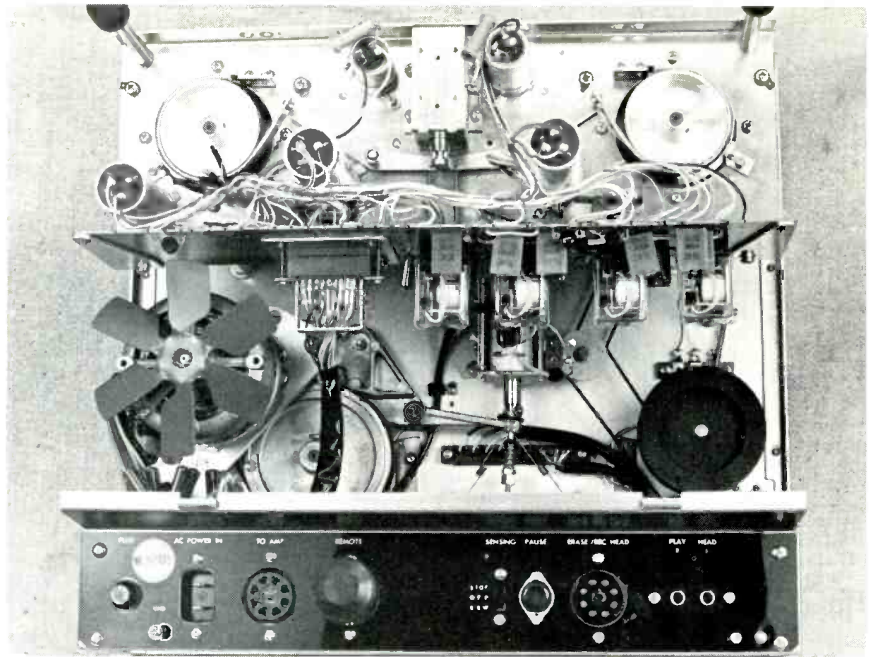


Fig. 2—Showing transport section from rear. Note massive flywheels on both capstan (left) and stabilizing roller (right).

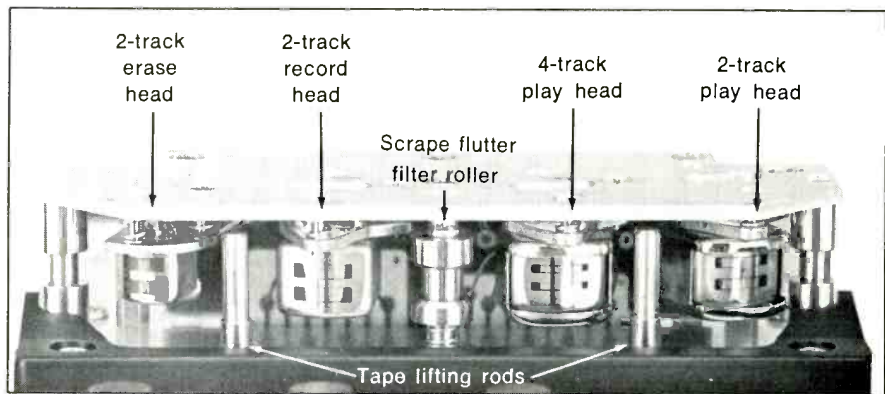


Fig. 3—Close-up view of the head assembly. Note the additional head at right for playback of four-track tapes.

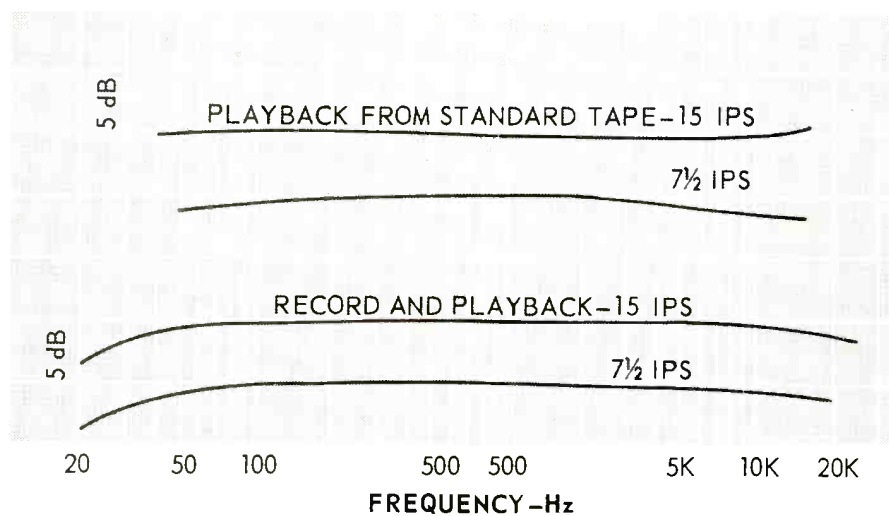


Fig. 4—Response curves for playback of standard frequency tapes and for recording and playback at both speeds.



play mode, the record heads are shorted to ground.

The bias/erase oscillator, operating at 108 kHz, consists of a balanced push-pull circuit, with the output deriving from a secondary winding on the oscillator coil. When recording on only one channel, a simulated load impedance absorbs the signal which would normally be supplied to the head not in use.

The power supply utilizes a transformer with two secondaries—one for the meter lamps and one for collector supply for the amplifiers. This is rectified by two diodes, and is well filtered. A relay in the amplifier chassis performs the equalization changes necessary for the two speeds, and with six more relays in the transport, there is a complement of seven altogether, along with 24 transistors and 10 diodes.

Accompanying the A-7030 is an attractive flexible plastic cover which can be used to protect the machine from dust and exposure. Also included are the ubiquitous flannel polishing cloth, two spare fuses, a small bottle of oil, and two Allen wrenches for use in ordinary maintenance operations. Also included, of course, are the two NAB reel holders, two rubber reel stops for 7-in. and smaller reels, and one aluminum NAB empty reel. The power cord, separable, and two phono-tipped patch cords are provided for the necessary connections.

### Operation

As would be expected from a professional caliber unit, such as this one, the machine performed flawlessly. One of the usual tricks that reviewers are wont to perform is trying to break the tape. I can be done if you try real hard, but it requires two fingers or two hands to operate the controls fast enough and if you do not follow the instructions given. It is suggested that when fast winding and a stop is desired that you should first depress the fast-winding lever for the other direction, then the stop button. If you do this, you can't break the tape. If, however, you go from fast wind to stop and then immediately to play, you are likely to break the tape, but it requires some very fast finger work. The first time we succeeded in breaking the tape we thought we had outwitted the machine, but it happened at an old splice. We did succeed later in breaking the tape itself, but only by disregarding the directions.

There is understandable joy in using a machine at 15 ips, even though it uses tape up fast. But what can we use for a source? We did have some 15-ips tapes that have been on hand for some

time, and used this as an opportunity to dub them to another machine at 7½ so we can play them at will. But the advantages of those tapes were only that we had them—they were mono, and almost twenty years old.

The performance of the A-7030U is so good at 7½ that the only advantage of the 15-ips speed would be for the individual who does a lot of original recordings—there is no need for 15 ips if you are recording from the air or for dubbing from phonograph records. Thus the main advantage of this machine is that of its finely finished construction, its very low wow and flutter, its excellent separation, and its signal-to-noise ratio.

### Performance

The frequency response of the A-7030U is shown in Fig. 4 from standard tapes, and from signals fed in at a constant level. The slight rolloff at the low end was not in evidence when we adjusted the input signal to the VU meters on the recorder, only from a flat input signal.

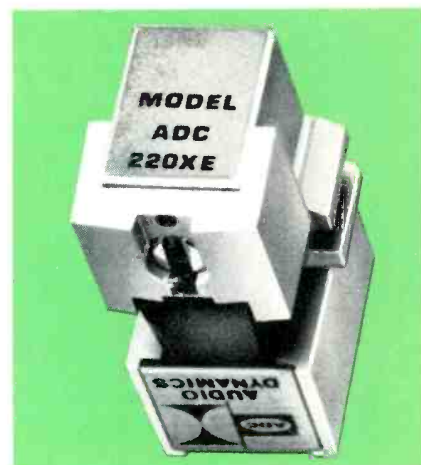
Flutter and wow measured a very low of .03% at 15 ips, and .06% at 7½, both of which are excellent. Signal-to-noise ratio at 15 ips was measured at 58 dB below the 3% distortion point, which occurred at +9 dB above the indicated 0 dB of the VU meters. At 7½ ips, S/N was 56 dB. Harmonic distortion was 3% at +9 dB, 1.6% at +6 dB, and 0.5% at 0 dB and at 10 dB below indicated 0. These figures were for all frequencies from 100 to 10,000 Hz, increasing to 1.2% at 50 Hz (which might be the fault of the generator). Rewind time for 1800 feet of tape was clocked at 90 seconds, which is pretty fast. Channel separation was measured at an even 50 dB, also excellent. Four-track performance was essentially identical, with only 2 dB lower S/N.

Using a hysteresis motor for capstan drive through a belt to a heavy fly-wheel, there was no change in speed as frequency was varied. Nor was there any change as voltage was lowered to 50. However, the machine would not start at any voltage lower than 96, but once playing it would continue down to 50 volts. The brakes, employing 270-deg. felt-lined copper bands, were extremely effective.

In conclusion, the A-7030U is a solid machine, built on a 3/16" steel panel as the main chassis, and it should last forever. And it is also a "solid" performer which should require a minimum of maintenance. It is a recorder of which anyone could be justly proud. C.G. McP.

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**Output:** 6 mV at 5.5 cms/sec. recorded velocity.

**Tracking Force:** 1 to 2½ grams.

**Frequency Response:** 10 Hz to 18 kHz ± 3 dB.

**Channel Separation:** 20 dB from 50 Hz to 10 kHz.

**Compliance:** 20 x 10<sup>-6</sup> cms/dyne.

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