



## TEAC 450 Cassette Recorder

### MANUFACTURER'S SPECIFICATIONS

**Heads:** Two, erase and record-playback. **Motor:** Hysteresis synchronous outer-rotor. **Wow and Flutter:** Less than 0.07%. **Frequency Response:** CrO<sub>2</sub>, 30 to 15,000 Hz, +2, -3; Hi energy, 30 to 13,500 Hz, +2, -3; Regular tape, 30 to 11,000 Hz, +2, -3. **Signal/noise:** 52 dB, 60 dB with Dolby. **Line output:** 0.3 V. **Headphones:** 8 ohms. **Dimensions:** 7 in. H x 17½ in. W x 10½ in. D. **Price:** \$429.50.

The 450 is TEAC's top-of-the-line cassette recorder and so we expected a high standard of performance. We can say right away that we were not disappointed. This model is not cheap at \$429.50, but we are sure many people will find that the extra facilities are well worth the extra cost. In appearance, it is rather different from most recorders being slightly higher with all the controls on the vertical front panel. Depth is less than 11 inches so the recorder can be placed on a shelf at eye level if so desired. The two VU meters are on the left, and to the right are three pairs of slider controls for microphone inputs, line inputs and outputs. Above the meters are seven piano-key switches for EJECT, RECORD, REVERSE, FAST FORWARD, FORWARD, STOP, and PAUSE. To the right of these is a tape run indicator, tape counter, equalization and bias selector switches, Dolby FM/copy switch, timer selector, and then the POWER/OFF switch. At the extreme left are sockets for headphones and microphones, and there are two small indicator lamps located between the VU meters. One is the

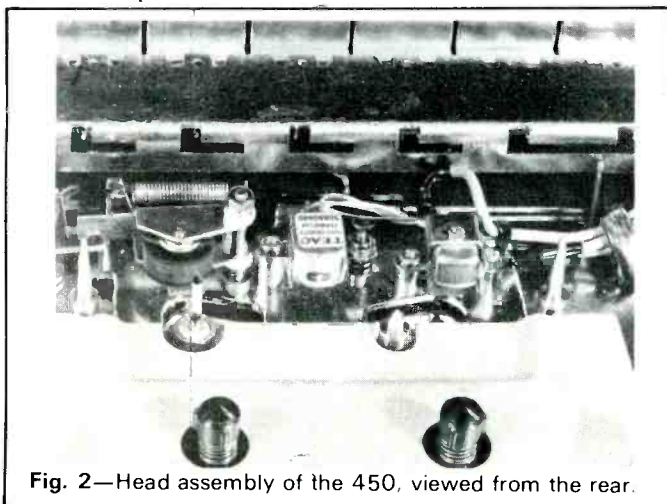


Fig. 2—Head assembly of the 450, viewed from the rear.

record indicator and the other is a peak level monitor. At the top, behind the piano keys, is the cassette-loading position and a large recess next to it will hold up to six tapes.

Now for a few words of explanation concerning some of the more unfamiliar controls. First, that Dolby FM/copy switch—the primary purpose of this control is to enable Dolby broadcasts to be recorded, and operation of the other Dolby switch will let you monitor either the Dolby decoded signal or the encoded signal. At the rear of the recorder is a calibration level control and all you have to do is to wait for the standard Dolby signal level signal which precedes the broadcast and then adjust the control until the VU pointers are at the Dolby calibration marks. Another use for the FM/copy switch is for copying Dolby encoded cassettes without re-encoding. Now for the equalizer and bias switches—they are entirely separate although they are both labelled NORMAL, HIGH and CrO<sub>2</sub>. They should, in fact, be used in tandem. (In theory, it might be possible to vary the equalization with normal tape or vice-versa, but we did not find it worthwhile with any of the tapes on hand; neither was this procedure recommended in the list of switch selector recommendations for various tapes printed in the owner's manual.) I found the timer selector switch easy enough to use, although it is an unusual facility for a cassette recorder! It is used in conjunction with an ordinary automatic timer—a clock unit with a switched a.c. outlet socket. The procedure is to set the volume level, wind the tape to the required position, and depress the play and pause buttons. When the timer switches the recorder on, the pause button is automatically released to start playback, or record if the record switch is on. At the end of the tape, the machine is switched off, together with a tuner or other equipment plugged into the a.c. outlet socket at the rear of the 450.

Here, it might be appropriate to say a few words in praise of the owner's manual. Like all those we have seen from TEAC, it is comprehensive and written in such a way that even a complete novice can understand. Standard accessories supplied with the machine include a plastic cover, silicone cleaning cloth, cleaning stick, spare fuse and input-output connection cord.

### Measurements

Figure 3 shows the frequency response at 0 VU and -20 VU, measured with Maxell UD tape. The -3 dB point is 13 kHz with overall response within 2 dB from 40 Hz to 12 kHz.

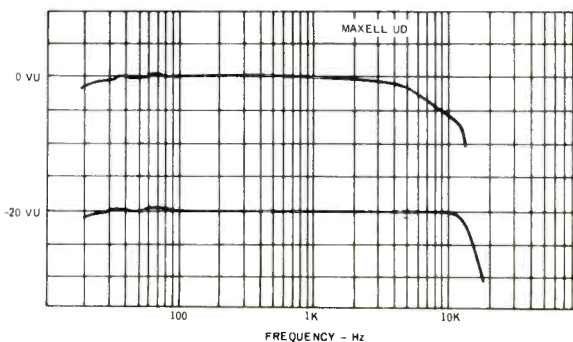


Fig. 3—Frequency response at 0 VU and -20 VU, measured with Maxell UD tape.

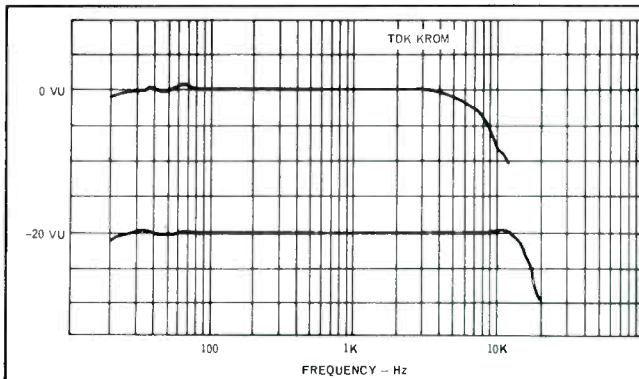


Fig. 4—Frequency response with TDK KROM-O<sub>2</sub> tape.

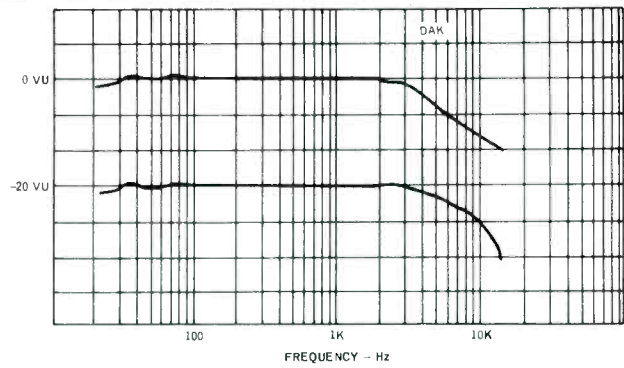


Fig. 5—Frequency response with DAK cobalt tape.

The next graph, Fig. 4, shows the results from TDK KROM-O<sub>2</sub> tape and it will be seen that the -3 dB point is a little higher at 15 kHz. The third graph (Fig. 5) shows the response from an inexpensive tape—DAK cobalt-energized UHF. Bias and equalizing switches were set to NORMAL positions. High frequency response was obviously not as extended as with the special low-noise tapes but the signal/noise ratio was almost as good. It would seem that the bias is a little too high for this kind of tape—at least for optimum results. Figure 6 shows the results with another kind of tape—Certron Gamma 60 iron oxide which is claimed to give a high performance without bias changes. Again, the signal/noise ratio was excellent—as good as the Maxell, in fact, but the response did not go out so high. Figure 7 shows the response from a standard test tape, and the distortion at -1 to +4 VU can be seen in Fig. 8. In order to reduce the possibility of overload, the VU meters are purposely calibrated 3 dB higher than DIN standard. In other words, +3 dB on the 450 corresponds to 0 VU on most other machines. The peak level indicator flashes at about +4 VU—another safeguard against overloading. Distortion is unusually low, being less than 0.5% at 0 VU and less than 1 percent at +3 VU over most of the band (see Fig. 9). Signal/noise came out at -52 dB, increasing to -62 dB with Dolby using CrO<sub>2</sub> or low-noise tapes. Output for 0 VU input signal was 420 mV and the input required was 85 mV. Wow and

flutter measured 0.08% (DIN), the lowest we have measured in a cassette recorder, and speed was very accurate—right on the nose. Rewind time was 92 seconds for a C-60 cassette.

Most of our recordings were made with the Dolby system switched in. Incidentally, if you are wondering why no Dolby frequency measurements are shown, the reason is simple—the divergencies were negligible, which is as it should be, assuming the calibration is adjusted correctly. Unfortunately, there are no FM stations in our reception area using a Dolby system, but some Dolby cassettes were copied with complete satisfaction. Because of the excellent signal-to-noise ratio, it was possible to keep the VU meters well below the +3 VU mark and record quite high transient peaks without distortion. The low frequency end was well defined with a solid bass comparable to tapes made with an open-reel recorder. We found the large VU meters easy to read, and all the controls worked smoothly without fuss. All-in-all, a nice machine to use. In terms of distortion, frequency response, and wow and flutter, there is no doubt that the 450 is the best—certainly one of the best cassette recorders available today. And, of course, there are the extra facilities like the provision for a timer and the Dolby copy switch—not forgetting the headphone outputs. Many cassette units do have this last facility but the 450 is one of the few that contrive to give really good power output!

Check No. 62 on Reader Service Card

G. W. T.

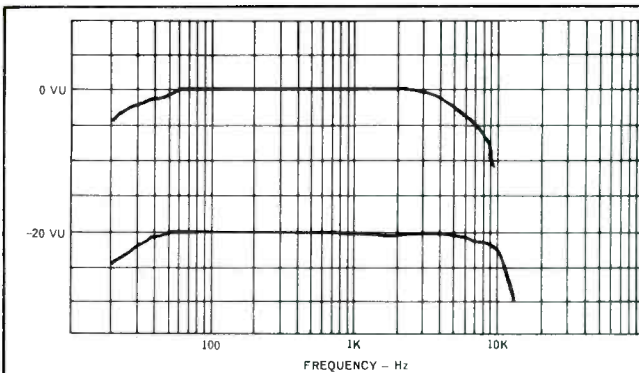


Fig. 6—Frequency response with Certron Gamma 60.

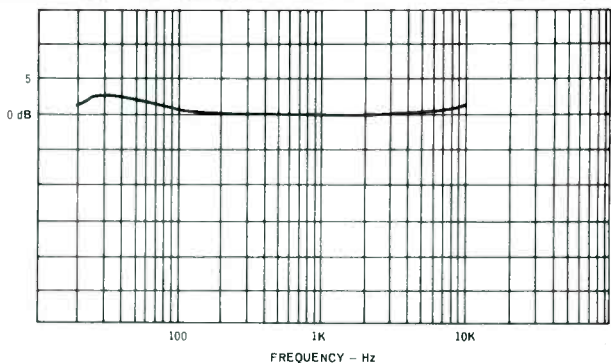


Fig. 7—Frequency response from standard test tape.

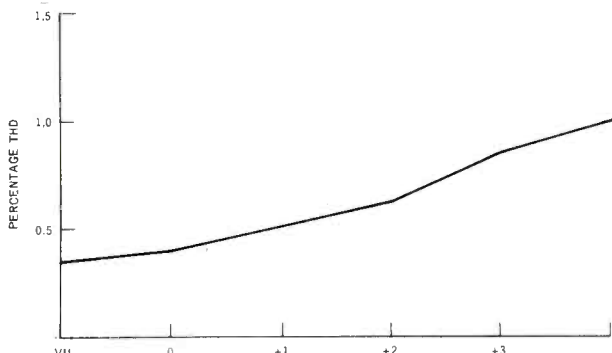


Fig. 8—THD from -1 to +4 VU.

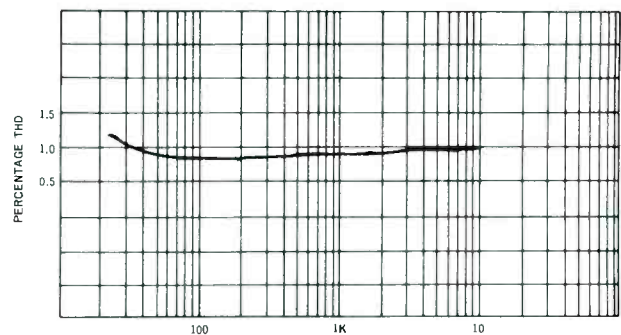


Fig. 9—Distortion versus frequency at +3 VU.