Kenwood KX-1030 Cassette Deck

MANUFACTURER'S SPECIFICATIONS

Heads: Three, ferrite type.
Motor: Electronically controlled d.c.
Wow & Flutter: 0.06 per cent W rms.

Frequency Response: Normal, 35 Hz to 15 kHz, ±3 dB; Ferrichrome, 35 Hz to 17 kHz, ±3 dB, and CrO_2, 35 Hz to 18 kHz, ±3 dB.
S/N Ratio: 67 dB with Dolby and 57 dB with Dolby out on CrO_2 tape.

Headphone Output: 48.9 mV @ 8 to 16 ohms.
Dimensions: 17 in. (43.2 cm) x 6½ in. (16.5 cm) x 12 in. (30.5 cm).
Weight: 16.5 lbs. (7.5 kg).
Price: $400.00.

Kenwood's KX-1030 is a typical example of the new generation of front-loading cassette decks introduced at the recent Japanese Audio Show (*Audio,* Feb., 1978, pg. 42) in Tokyo. Among the features of these decks are three heads with monitoring facilities, a built-in signal generator, separate bias and equalization controls, plus a servo-controlled d.c. motor. Styling is fairly conventional with the usual satin-silver panel and matching controls contrasting with the black metal cover. The six tape transport keys are located just under the cassette compartment, and while there is no *Eject* control as such, a light touch on the spring-loaded door pops the cassette out. To the left of the compartment is the *On/Off* switch and the headphone jack, while the two illuminated VU meters are to the right. The microphone and line input controls are underneath them, along with the *Tape Monitor* and *Dolby* switches. Next along the line come the dual *Line Output* control, *Oscillator,* and *Tape Equalizer* switches. A digital counter, *Memory* switch, and the *Dolby* and *Record* indicator lights are located just above the meters.

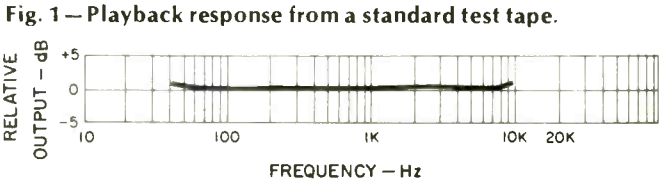
As most readers have probably guessed, the function of the built-in signal generator is to facilitate the adjustment of the bias controls (there is one for each channel, arranged concentrically). If the bias current is too high, then the treble response will tend to fall due to partial self-erasure; on the other hand, if it is too low, the high-frequency response will be greater, making the sound appear to be overly bright. One method of adjusting the bias is to record a frequency in the midrange and then juggle the bias until a signal in the 10- to 12-kHz range is at the same amplitude. Since the bias control will affect both frequencies, this procedure can become a bit tedious . . . so Kenwood has come up with an ingenious circuit using an automatic switch to apply both frequencies sequentially. All the user has to do is to insert the cassette, switch the deck to *Record,* and depress the *Oscillator* button. The VU meters will then show a fluctuating reading, and all you have to do is to adjust the bias controls to a level output—and that's it. Incidentally, the adjustment frequencies are at 400 Hz and 10 kHz. It should be mentioned that when the oscillators are functioning, the *Record* light flashes so there is little danger of spoiling a tape.

Inside the cassette deck, all the electronic components are dispersed among four printed circuit boards and the general quality of workmanship is excellent. The servo-control signals for the d.c. motor are obtained from a Hall-effect diode working in conjunction with a rotary ferrite magnet.

Measurements

The first test performed was the measurement of the playback response using a standard test tape, and the results are shown in Fig. 1. Next a Maxell UDXL-I tape was inserted and the bias was checked, using the method described earlier. The Record/Replay response was then measured at 0 VU and at −20 dB and is shown in Fig. 2. The upper 3-dB point was just over 16 kHz with a low-frequency response only 2 dB down at 30 Hz. The Maxell cassette was then replaced by a TDK SA tape and the equalizer switch was turned to CrO_2 . . . again the bias was adjusted before making the measurements. The 3-dB point came out a little higher at 17 kHz (see Fig. 3) with a slightly greater roll-off at the low end. A Sony Ferrichrome was next tested, and the response was found to be quite similar to the TDK SA (see Fig. 4). Finally one of the new BASF Super Chrome cassettes was tested, and here the high frequency response extended out to 17.5 kHz. All four tapes had similar distortion characteristics at 1 kHz with the headroom between 5.5 and 7 dB (see Fig. 5). Figure 6 shows distortion versus frequency at 0 VU . . . a stringent test as we have mentioned before. It will be seen that the TDK SA has a slightly reduced headroom below 80 Hz, while the dif-

Fig. 1—Playback response from a standard test tape.



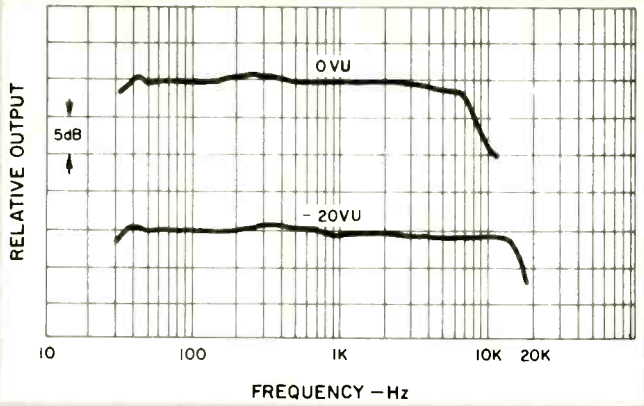


Fig. 2—Record/Replay response with the Maxell UDXL-I tape.

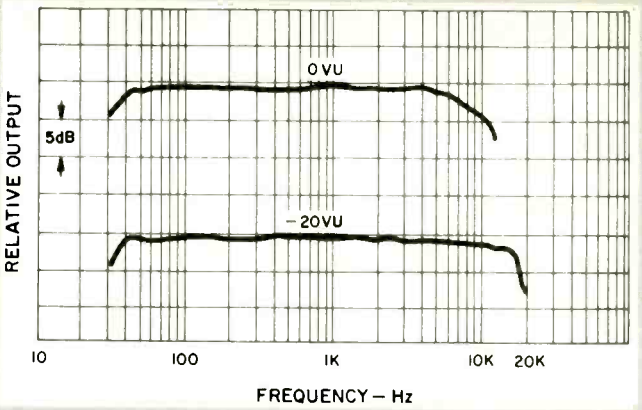


Fig. 3—Record/Replay response with the TDK SA tape.

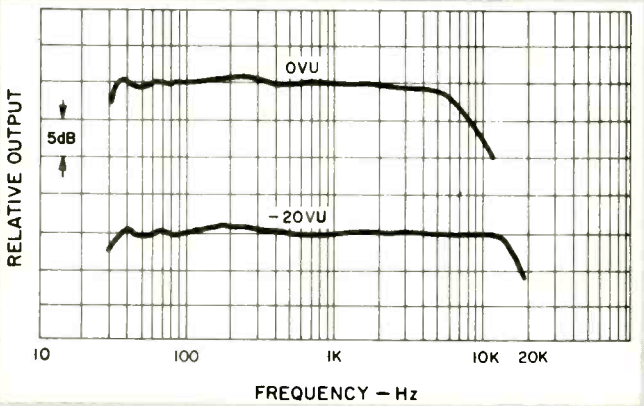


Fig. 4—Record/Replay response with the Sony Ferrichrome tape.

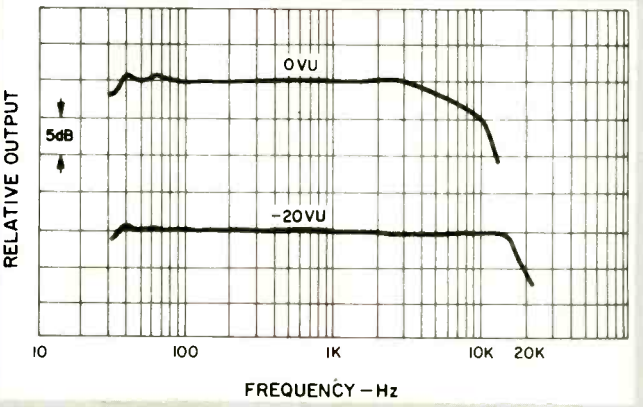


Fig. 5—Record/Replay response with the BASF Super Chrome tape.

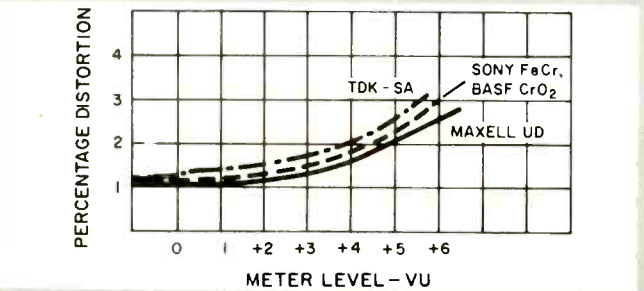


Fig. 6—Distortion vs. level for a 1-kHz signal.

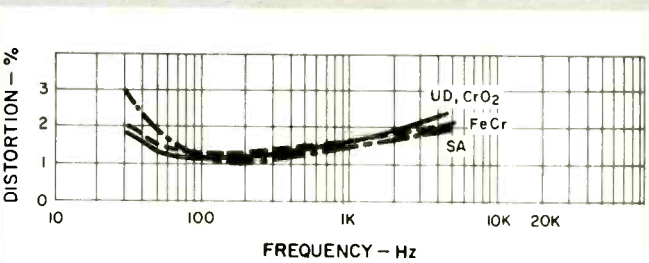


Fig. 7—Distortion vs. frequency measured at 0 VU.

ferences among the other three are small enough to be classified as insignificant. The signal-to-noise ratio measured 59 dB for the Maxell UDXL-I, 60 dB for the TDK SA, and 60.5 dB for the BASF Super Chrome (ref. 3 per cent THD, "A" weighting). Switching in the Dolby system would increase these figures by about 9 dB. At this point in the tests, the Dolby tracking was checked and found to be within 1.3 dB down to below −40 dB. Erase efficiency was better than 65 dB with all four tapes.

The input signal required for 0 VU was 85 mV line and 180 μV for microphone with the output then being between 650 and 800 mV, depending upon the kind of cassette tape used. Signal-to-noise ratio decreased by a maximum of 14 dB with the microphone input control in its fully-clockwise position. Wow and flutter measured a respectable 0.06 per cent, and the tape speed was found to be within two decimal places of absolute accuracy. Rewind time for a C-90 cassette was 115 seconds.

Listening and Use Tests

As far as general performance is concerned, Kenwood's KX-1030 either meets or exceeds its specifications by a comfortable margin. There is no doubt that this unit must take its place among the very best in this particular price range. I suppose the most interesting feature is the ingenious bias adjustment system which not only takes care of all current tapes on the market, but will also get the best results from almost all future tape formulations. It must be remembered that not all cassette decks can use the CrO_2 tapes and only a few models have provisions for Ferrichrome. So the bias adjustment system is a definite plus feature that will appeal to many audiophiles, while the monitoring facility will be appreciated by the novice as well. At present, few cassette makers offer three-head decks, but I'm sure that many more manufacturers will offer this refinement in the not too distant future.

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