

Technics RS-676 Cassette Deck



MANUFACTURER'S SPECIFICATIONS

Wow and Flutter: 0.08% or better. **Overall Frequency Response:** 40 Hz to 12 kHz, +2 dB, -3 dB with LN tape. 40 Hz to 13 kHz +2 dB, -3dB with Cr₂ tape. **Signal/Noise Ratio:** 50 dB; 58 dB or better with Dolby. **Distortion:** 2.0% at 0 VU, 1

kHz. **Input Sensitivity:** Mike, 0.3 mV; Line, 60 mV; Tuner, 100 mV. **Output:** 0.42 V. **Heads:** 2. **Motors:** 2. **Dimensions:** 16 $\frac{3}{8}$ in. W. x 14 $\frac{3}{8}$ in. D. x 5 $\frac{1}{2}$ in. H. **Price:** \$459.95.

Cassette recorders are getting more and more professional in styling, and there is a definite trend towards front loading with the more expensive machines. A good example of both trends is the Technics RS-676, and very impressive it looks with its instrument-type controls and satin aluminum and black finish. The cassette compartment is on the left and a touch of the eject button will release the door catch so it can be opened by hand. The cassette is loaded by placing it inside the "oven" and pressing it downwards. The compartment is illuminated and a large glass window in the door allows one to see whether the tape is rotating. But, you may say, this is all very nice, but how about cleaning the heads? *Audio* has always emphasized the importance of this exercise, and for good reason. However, in this case, we can report that head cleaning is really not difficult. The heads are placed right up front and there is a detachable cover which helps a lot, as does a mirror mounted at the rear.

Technics has recently started "guaranteeing" its five most pertinent specifications, meaning that the unit will either meet or beat this level of performance. As we shall see, this means Technics is now being even more conservative in its ratings than previously. The firm is also actively encouraging owners to bring in their equipment for test and adjustment if they feel the unit isn't up to snuff, and the company is also distributing a booklet giving detailed descriptions of their test procedures and standards.

Now for a look at the controls. First, to the right of the "oven" is a set of six bar switches, two large ones for *Play* and *Stop*, and the others for *Fast Forward*, *Fast Reverse*, *Record* and *Pause*. Both the last-named show a visible indication and the *Record* button is unusual as it is not interlocked. In other words, the machine is ready for recording as soon as this button is depressed. You can, of course, set the recording level first as the VU meters are connected at this point. Above these controls are a digital counter and a memory switch, and to the right are two *Dolby* lever switches (I'll explain later) and a dual-concentric microphone input level control. Underneath is a large (very large) control knob that adjusts the recording levels for both chan-

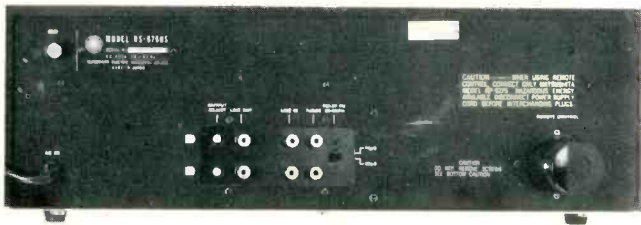


Fig. 1—Rear view of Technics RS-676.

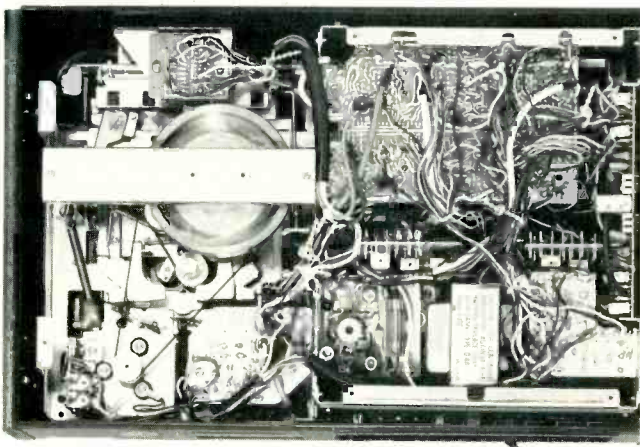


Fig. 2—Internal view of cassette deck.

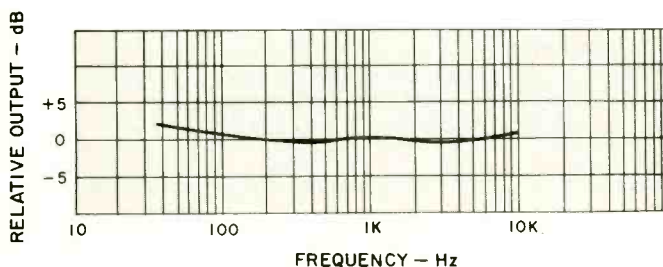


Fig. 3—Playback response using standard test tape.

nels and it is used with a balance control next to it. Further to the right is a three-position selector switch marked *Mic*, *Line-In/Mic*, and *Tuner-mic*. At the bottom is a *Tape Selector* switch for *Normal* and *CrO₂* tapes, two pre-set *Dolby* calibration controls, headphone and microphone sockets, plus the *On/Off* switch. The two VU meters are at the top and between them is a small push-button switch which changes the meter constants from average to peak values. There are two scales, one going up to +6 VU and the other calibrated in percentages with 100% corresponding to 0 VU.

At the rear are the usual *Line In* and *Line Out* sockets, two *Output* controls, a switch to change the *Dolby* de-emphasis constant from 75 μ S to 25 μ S and a socket for a *Remote Control* unit.

And now for some explanations. *Normal* on the *Tape Selector* switch refers to low-noise tapes such as TDK SD, TDK ED, or BASF SK. The *CrO₂* equalization is 70 μ S, instead of the older 120 μ S standard. Technics claims this provides worthwhile improvement in signal-to-noise ratio, which is indeed the case. If one has recordings made with the 120 μ S equalization, using the *Normal* position of the switch will give the proper equalization. The 676 is also equipped with an auto-switching feel tab which engages with the latest chrome cassettes to switch over to the correct equalization automatically. The reason there are two *Dolby* switches is because one is intended for FM recordings and it has a filter position attenuating the response above 18 kHz so the 19 kHz carrier will not upset the *Dolby* operation. Decoded signals can be taken from the cassette unit and fed to the amplifier if desired and the switch at the rear is for use when recording programs from FM stations using the new 25 μ S time constant (which will soon become standard). The

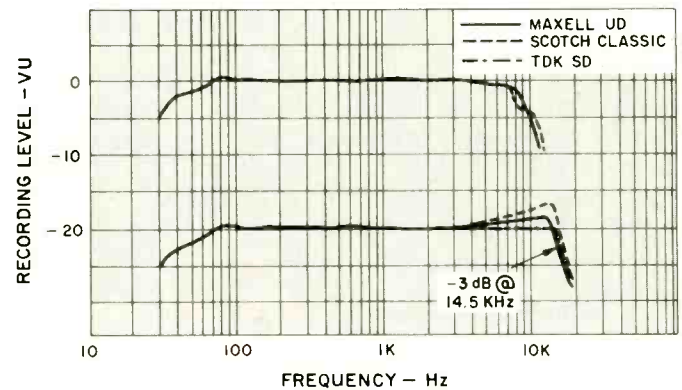


Fig. 4—Record/play response at 0 VU and -20 VU, with Maxell UD, and with Scotch Classic tapes.

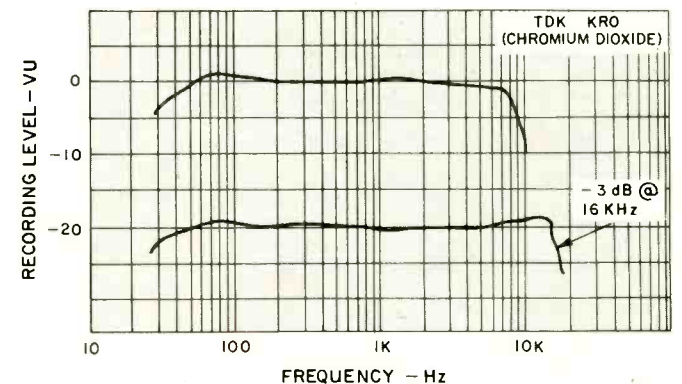


Fig. 5—Record/play response with TDK KRO tape.

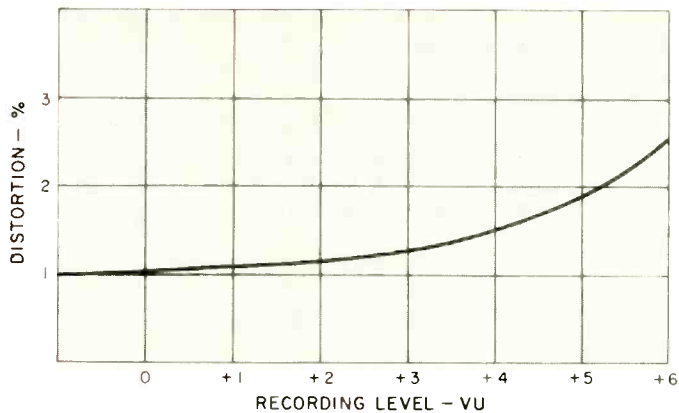


Fig. 6—Distortion at 1 kHz

Memory-Play switch is a little unusual, as it sends the tape back to a pre-determined point and then the tape doesn't just stop; it immediately goes into playback mode. Instant replay? Well, almost. The Selector switch—the one labelled Mike, Line and Tuner allows a microphone signal to be mixed with the inputs from a tuner or other source.

Tape functions are controlled by solenoids and special muting circuitry is employed to prevent switching clicks from being recorded. Two motors are used, an electronically regulated d.c. type for the capstan drive and another d.c. motor for the cassette drive. A photo-electronic automatic stop disengages the transport mechanism at the end of a cassette, regardless of whether the tape is in the fast-forward, rewind, or playback mode. It operates even if the a.c. power goes off.

Measurements

Figure 3 shows the playback response from a standard test tape, and Fig. 4 shows the Record/Play response with Maxell UD and Scotch Classic tapes. The latter is a hybrid ferric-chrome formulation and it really needs different equalization. As it is, its rather hotter top end response can be tamed by turning down the amplifier's treble control slightly during playback.

Figure 5 shows the response with CrO₂ tape. It will be seen that the upper response extends to 16 kHz. The specifications quote the 3 dB point for normal tape at 12 kHz and 13 kHz for CrO₂. Both were exceeded by a comfortable margin. The CrO₂ tape was TDK KROM, but similar results will be obtained with other makes as most use DuPont chromium dioxide. Distortion at 1 kHz measured 1.0% at 0 VU (see Fig. 6) increasing to 2.5% at +6 VU.

Distortion versus frequency is shown in Fig. 7, and here I also illustrate a problem I encountered. The VU meters are not linear with frequency. While it is not uncommon to tailor VU meter response to read higher at frequencies above 5 kHz or so, since this provides some safeguard against tape saturation, these meters read low below 100 Hz! Thus, an input signal level that produced a zero VU reading at 1 kHz would only cause the meters to read -10 dB at 50 Hz and if the signal were increased to make the meters read zero VU overloading of the tape would result. The upper graph (Fig. 7) shows the meter response and the lower curve indicates the distortion measured with a constant input level based on 0 VU at 1 kHz.

Input signal for 0 VU was 55 mV line, 80 mV tuner, and 0.26 mV microphone. Output under these conditions was 410 mV. Signal-to-noise ratio measured 52 dB, increasing to 62 dB with Dolby (DIN weighted, ref. 0 VU). The Dolby sys-

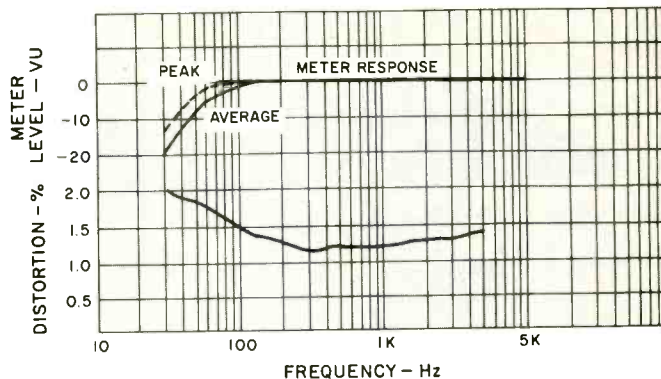


Fig. 7—VU meter characteristics (top) and distortion (bottom) versus frequency.

tem worked according to specifications with a tracking error of just over 1 dB. Wow and flutter was exceptionally low at 0.05% (DIN Record/Play) and speed clocked in at 0.4% slow. Finally, cassette rewind speed was 65 seconds for a C-60.

Listening and Use Tests

On test, the 676 was connected to a Soundcraftsmen PE 2217 preamp with a Phase-Linear 400, and discs were taped via a Thorens TD 125 Mk II with a Audio-technica AT20 phono cartridge. Unfortunately, we do not have a local FM station using a Dolby encoder (any time now!) but recordings were made from "normal" FM stations, records, and transfers from an open-reel machine. I found the single control recording arrangement very easy to use and I don't think there is any real danger of accidental erasure once you have got used to it. The VU meters were left in the peak indication mode for most of the time as this gave more accurate transient readings. Because of the well-designed transport system with its two motors, wow and flutter is as low as I have found with any cassette recorder. Indeed, it is comparable in this respect to an expensive open-reel machine. The signal-to-noise ratio is excellent, too. All-in-all the Technics RS-676 is a well-designed machine which will appeal to the most discriminating. It's not cheap at \$459.95, but you do get a lot for your money. George W. Tillett

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MIKE EDDINGER

"Just think, my Fred is going to uphold the new Federal power-output ruling!"