

234 SYNCASET®

4 TRACK CASSETTE RECORDER/REPRODUCER



TASCAM
TEAC Production Products



If you want the production power of a 4-track open reel machine plus the convenience and portability of a compact cassette, then our Model 234 Syncaset® is for you. It's the perfect tool for production of demo tapes, working out complex musical arrangements, in fact, any application needing high quality, 4-channel sync recording and playback.

And, by itself, our 234 is a formidable machine. Match it with a mixer to add EQ, cue and monitor mixes, solo and effects sends/returns and what have you got? A complete 4-track studio. A unique machine? Absolutely. And if price is important, you're in for an even bigger surprise.

Over the last 10 years, our engineers have expanded the use of the cassette format far beyond its original intent, and provided engineers, producers and musicians more than they ever thought possible. The developments have been mind-boggling.

The 234 is an extension of advanced cassette technology. It's perfect for AV, or non-sync film and video soundtracks that are compatible with the latest 133 and 244 machines. You can even use the 234 in conjunction with the 133 or 244 to make real-time copies.

SPECIALLY ENGINEERED TO RECORD LIVE SOUND ON CASSETTES

Originally, the compact cassette was created for recording of speech. Over the years it has been refined for greater fidelity and dynamic range.

Because hi-fi cassettes are most often used to re-record music that has already been placed on records or broadcast on the radio, signals already processed, they do not have to handle a lot of dynamic range. If you attempt to record live music on a standard 1 7/8 ips cassette you will be limited in the dynamics that you can get onto tape. You'll have to "hold back" in the performance, use a compressor, or, most likely, be forced to put up with distortion and noise.

To better enable compact cassettes to handle the dynamics of live recording, we did two things. We doubled the tape speed to 3 3/4 ips (9.5 cm/s), resulting in much more headroom, especially at high frequency, plus lower tape noise. And, to further increase the headroom and the useable dynamic range, we included dbx II Tape Noise Reduction.* These two measures reduce tape hiss to inaudibility and yield an effective dynamic range of over 90 dB. For alignment and special applications, a noise reduction bypass switch is provided. But let's put all the facts on the table. While we've pushed cassette technology ahead once again, there are still 4-track applications where the additional headroom and frequency response you get from an open reel machine is necessary. We ought to know. We've been making open reel machines for over 30 years.

MICROPROCESSOR CONTROLLED TRANSPORT

We've built our engineering reputation building everything from 40 track data recorders to the airborne video tape recorders used in the Columbia Space Shuttle. Our design teams take on any kind of recorded signal, from DC to light!

They created the 234 around a highly advanced, 3 motor servo-controlled transport to keep wow and flutter to an insignificantly low 0.04%. Since a piece of tape can get shuttled back and forth a hundred times or more before it's ready for mixdown, the custom programmed microprocessor (uP) eliminates tape stretch and breakage. This is the kind of performance you can't do without.

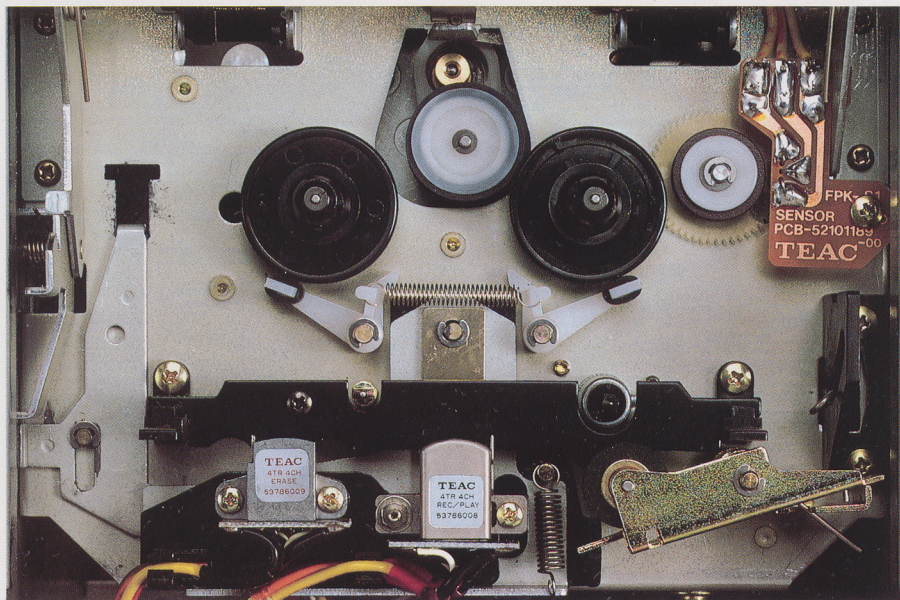
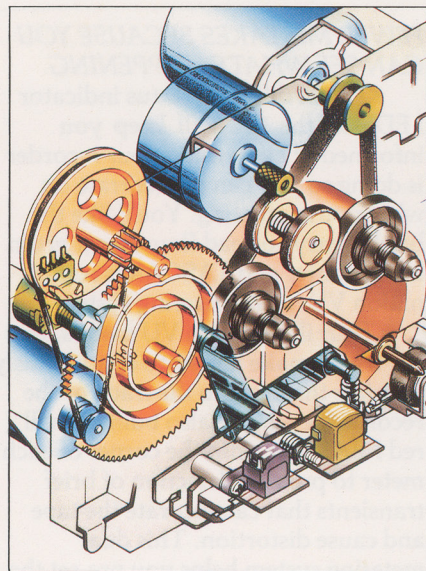
The microprocessor control optimizes changes in tape motion so there's no wait for the tape to slow, stop, and restart. We built the 234 with an all electronic, 4-digit counter for more accurate settings. Wow and flutter are held to the tight tolerances we specify because there are no belts, pulleys or wheels on the counter.

The pitch control on the 234's servo-controlled transport is a feature you'll quickly depend on. Press in and lock the speed at exactly 3¾ ips. Pull the knob out, and you can vary the record or play speed plus or minus 12 percent. You can retime a 62 second spot or, bump the speed up a bit to pick up the tempo of a performance.

A STABLE MACHINE THAT STAYS IN ALIGNMENT

Our high strength, reinforced, folded steel chassis means the entire transport stays properly aligned year after year of professional use. A separate motor moves the head assembly in, for record or play, and out for fast winding. The movement is gentle so heads stay in alignment. It's a far cry from typical solenoid-operated heads that slam into place and spring out. Despite its tiny size, our single record/play head yields superb response and track separation. The record and repro heads just can't get out of alignment because they are one in the same. The rigid transport, the gentle motorized head-moving mechanism and precision record/play heads ensure alignment stability this year and the next and the next...

Drift is minimized and reliability maximized because we use modern, high-speed IC's. Our 234 is internally adjusted to work with high bias, 70µs. EQ gamma ferric oxide (Type II) tapes for better frequency response at high levels with less distortion. A tape such as Maxell UDXL-II or TDK-SAX is a good choice for standardizing master tapes.



FEWER MISTAKES BECAUSE YOU CAN SEE WHAT'S HAPPENING

The 14 different status indicator LEDs on the 234 will keep you informed of everything your recorder is doing so you can concentrate on what you're creating. You'll like the bright, easy-to-read flourescent green tape counter and TASCAM's combination VU/peak metering system.

Four illuminated VU meters, one per track, make it easy to continuously monitor the input to the track or the recorded level. We also built a small red PEAK LED into the corner of each meter to provide detection of brief transients that can saturate the tape and cause distortion. This dual metering system helps you pre-set the recording level for the best compromise, between a high average level for optimum signal-to-noise ratio and a level that will permit maximum headroom and minimum distortion.

The meters are also switchable so you can see levels at the CUE OUT jacks. when you press in the METER button, the lights in the track 3 and 4 meters go out. The track 1 and 2 meters now display the CUE L and R level.

SYNCH RECORDING THAT WORKS LIKE LARGE, MULTITRACK MACHINES

Talk about scope! Our 234 Syncaset® operates exactly as a 4, 8 or 16 track professional multitrack recorder. Each track can be placed in record ready or record mode independently of the others. Overdubs or inserts are a snap because the 234 permits synchronous playback of some tracks while others record (Simul-Sync operation). An INPUT/ SYNC switch enables you to monitor either the input for a track or the pre-recorded track up to the instant before you "punch in" to begin recording.

When you're laying down the basic tracks or if you want to practice overdubs without actually recording, you can set the INPUT/SYNC switch to INPUT position. Then, with the 234 in play mode, the FUNCTION SELECT switches will select between tape playback and input source for each track.

If you're overdubbing or doing an insert, you can listen to other tracks and hear your "live" input at all times. When the 234's INPUT/SYNC switch is in SYNC position, the electronics are "pre-loaded." You'll be able to hear synchronous playback until the moment you punch into record mode.

STEREO AND MONO MIXING FOR MONITORING

When you're working with 4 tracks, you've got to hear what you're doing in stereo. That's why we equipped the 234 with a stereo PAN pot and OUTPUT level control on each track. But if you need monaural monitoring you push the CUE switch to MONO and feed the same signal to both cue outputs.

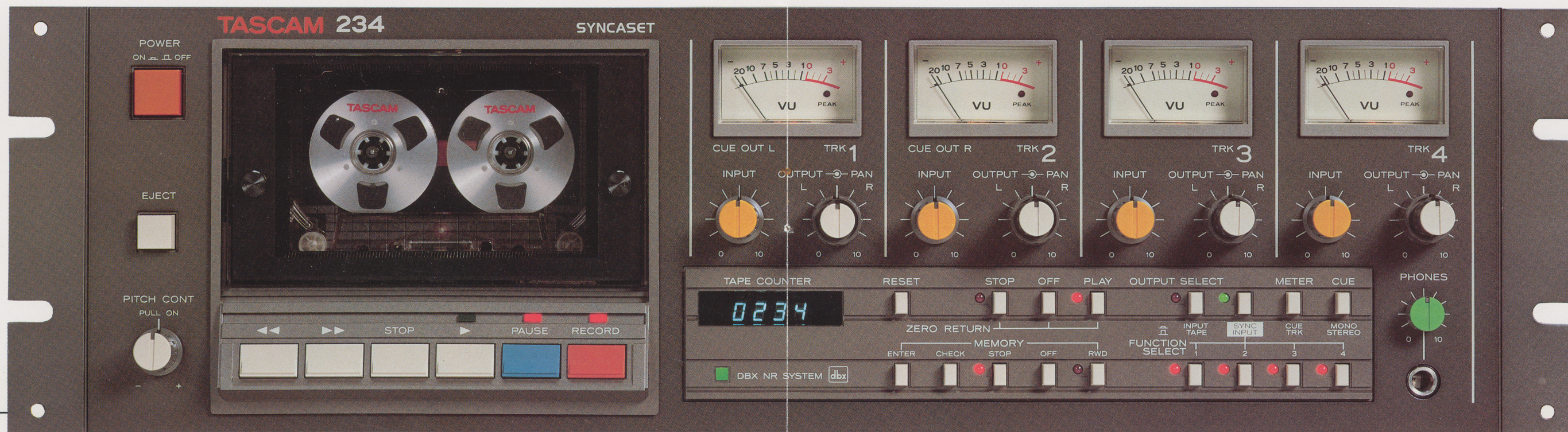
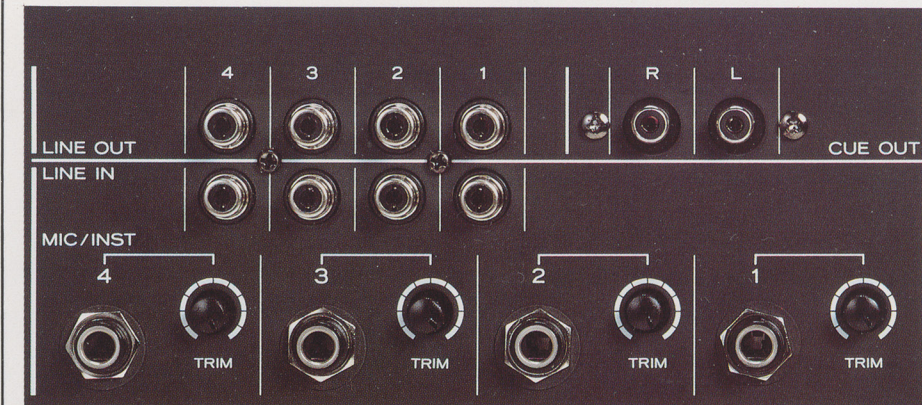
Because you can make a stereo or mono cue mix to feed headphones, you can work without an external mixer during initial recording and overdubbing. And you won't have to rely on the mixer's cue facilities. Very handy when the 234 is recording a PA mixer's buss outputs for a "live" multi-track tape destined for future mixdown to stereo.

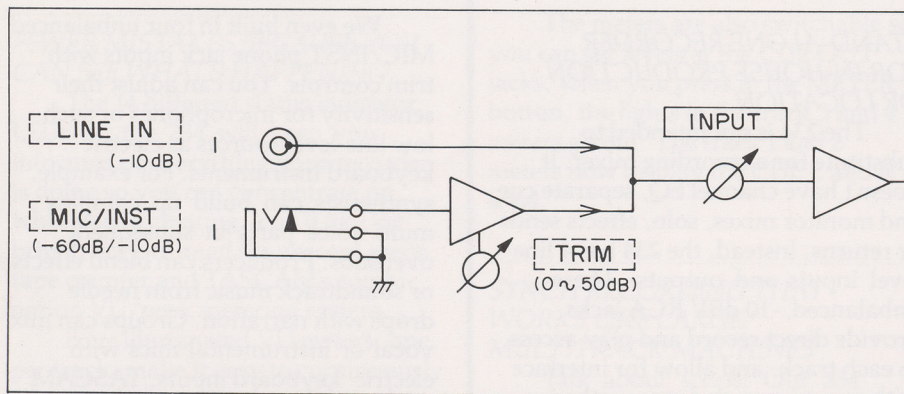
Rear-panel CUE OUTPUT jacks free you up for more than one set of headphones. The mix can also be fed to an external headphone distribution system when teamed up with the TASCAM MH-40.

STAND-ALONE RECORDER FOR IN-HOUSE PRODUCTION OR LOCATION

The 234 is not intended to substitute for a recording mixer. It doesn't have channel EQ, separate cue and monitor mixes, solo, effects sends or returns. Instead, the 234 has 4 line level inputs and outputs. These unbalanced, -10 dBV RCA jacks provide direct record and play access to each track, and allow for interface with our mixers, and many others.

We even built in four unbalanced MIC/INST phone jack inputs with trim controls. You can adjust their sensitivity for microphones or such low line-level sources as electric keyboard instruments. For example, synthesists can build up complex multi-voice parts in subsequent overdubs. Producers can blend effects or soundtrack music from needle drops with narration. Groups can mix vocal or instrumental mics with electric keyboard inputs. TASCAM 109B plug-in input transformers permit use of balanced low-Z mics.





1 TRK	A
2 TRK	B
3 TRK	C
4 TRK	

1. First, three tracks of the four-track tape are recorded.

A-B-C+D

2. These tracks are then mixed for proper balance and re-recorded on the fourth track of the tape while simultaneously recording a new part on the fourth track via the mic/inst input.

E
F

A-B-C+D

3. New parts are then recorded on tracks one and two.

E-F+G
A-B-C+D

4. These tracks are then transferred to track three with the addition of another new part.

H

E-F+G
A-B-C+D

5. A new part is then recorded on track one.

H+I
E-F+G
A-B-C+D

6. Track one is transferred to track two while adding yet another part to the same track via the mic/inst input.

J
H+I
E-F+G
A-B-C+D

7. This leaves just one spare track on which the 10th and final part is recorded.

WOULD YOU BELIEVE EVEN MORE CAPABILITY?

You can record up to eight sources on the 4 tracks in a single take because the LINE and MIC/INSTRUMENT input of each channel are internally mixed. This also gives you the flexibility of using the line inputs to "bounce" or "ping-pong" previously recorded tracks while blending in additional live sources.

Suppose, for example, you have already recorded three different instrumental parts on tracks 1, 2 and 3. You can mix these tracks to mono by panning track 1-3 full left and adjusting the track OUTPUT controls for the desired balance. Stay with us. A patch cord from CUE OUT L to LINE IN 4 brings the three existing tracks into the remaining "open" track. At the same time, you can plug a mic or instrument into the MIC/INST-4 jack, and adjust the TRIM control as needed and pan full right. With tracks 1-3 playing and 4 recording, you can combine four discreet sounds on a single track. Did we say this machine was capable? Make that very capable.

Since tracks 1, 2 and 3 are now "opened up," the same "recorded tracks plus live input" technique can be used again to re-record new sounds on tracks 1 and 2. You can then play them back and blend them with a live source onto track 3, and so on until the final live source is recorded onto the one remaining track. This process makes it possible to create a 4-track master cassette with 10 different parts on it. And none is more than a second generation recording! Since the dbx noise reduction prevents significant hiss build-up, the 234 quality is good enough to bounce tracks at least one additional generation for as many as 15 parts on one cassette.

After you've created a multitrack cassette on the 234 you can mix it down to mono or stereo using the 234's built-in cue mixing system. The rear-panel CUE OUT can feed another cassette recorder to make a reference tape, or an amp and speakers. All this can be done using only the 234's input and cue mixing capability. Team up the 234 with a mixer, and you have a full-capability multitrack recording system.

FAST AND EFFICIENT PRODUCTION

"Block Repeat" is a handy function whenever you have to shuttle back and forth over the same segment of tape dozens of times. Because it has 2 "search" points, with programmable loop functions, the 234 makes the task simple. One programmable point is ZERO RETURN function that will STOP rewinding when the tape counter displays zero, but it can also be programmed to enter PLAY mode when the counter gets there.

A second programmable function, MEMORY, will "memorize" a cue location at any point on the tape the instant you press the ENTER button. even if you cut it "on the fly" while playing, recording or fast winding, the 234 catches on instantly.

The MEMORY function programs the tape to automatically STOP at the entered cue point, or REWIND to zero or beginning of tape (BOT), your choice. Together the ZERO RETURN and MEMORY cue functions can be used to rehearse an overdub. Reset the counter to zero at the beginning and enter the cue at the end and you can automatically play, then rewind, then play. This "block repeat" mode will continue as long as you want to work on the part.

If you leave the counter zeroed at the beginning of the tape you have an absolute reference. Doing this you are still able to quickly rewind to a given cue point without monitoring the tape counter. Just enter the cue point at the beginning of the program and set the adjacent memory function button to STOP. Pressing REWIND will stop the tape at the entered cue. This "stop at cue" feature also works in play or fast forward.

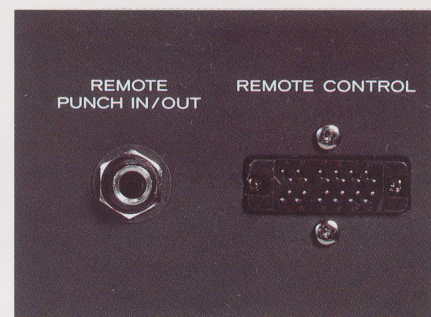
There is another feature of the 234 that'll help you with your editing: the PAUSE button. When the 234 is in play/pause or record/pause mode, the heads are in contact with the tape, the capstan motor is running, and the pinch roller is withdrawn just slightly from the tape. The moment you press PLAY, the 234 reacts. No delay punch-in to recording or instant-start playback.



REMOTE CONTROL CAPABILITY

Whether you're a busy engineer or producer, or a musician with both hands on an instrument, you'll love REMOTE PUNCH IN/OUT. For all those times when you simply can't drop what you're doing to press the RECORD button, plug in the optional RC-30P footswitch. Punch in and out of record as though you had a third hand.

An optional RC-71 Remote Control unit makes it possible to control the 234 from a distance, a convenience feature you sometimes can't be without.



* dbx and dbx II are trademarks of dbx, Inc., Newton, MA.

234 SPECIFICATIONS

MECHANICAL CHARACTERISTICS

Tape:	Compact Cassette C-30 to C-90, 70 μ s, Hi-Bias, Type II Tape
Track Format:	4-Track, 4-Channel
Head Configuration:	2 Heads, Erase and Record/Reproduce
Tape Speed:	3 $\frac{3}{4}$ ips (9.5 cm/s)
Speed Accuracy:	$\pm 1.0\%$ deviation
Pitch Control:	$\pm 12\%$
Fast Wind Time:	85 secs. for C-60
Recording Time:	15 minutes for C-60
Motors:	FG Servo Controlled DC Capstan Motor DC Reel Motor DC Control Motor
Dimensions (W×H×D):	482 × 147 × 357mm 19 × 5 $\frac{1}{2}$ × 14 $\frac{1}{8}$ inches
Weight:	21.6 lbs (9.8kg)

ELECTRICAL CHARACTERISTICS

Mic/Inst. Input (× 4)	
Mic Impedance:	Less than 10k ohms unbalanced
Input Impedance:	100k ohms
Nominal Input Level:	-10dBV (0.3V)
Minimum Input Level:	-70dBV (0.3mV)
Maximum Input Level:	+15dBV (5.6V)
Line Input (× 4)	
Input Impedance:	22k ohms Unbalanced
Nominal Input Level:	-10dBV (0.3V)
Minimum Input Level:	-20dBV (0.1V)
Maximum Input Level:	+15dBV (5.6V)
Line Output (× 4)	
Output Impedance:	100 ohms
Nominal Load Impedance:	10k ohms
Minimum Load Impedance:	1.7k ohms
Nominal Output Level:	-10dBV (0.3V)
Maximum Output Level:	+15dBV (5.6V)
Cue Output (L.R.)	
Output Impedance:	100 ohms
Nominal Load Impedance:	10k ohms
Minimum Load Impedance:	1.7k ohms
Nominal Output Level:	-10dBV (0.3V)
Maximum Output Level:	+15dBV (5.6V)
Headphone Output	
Nominal Load Impedance:	8 ohms Stereophones
Minimum Load Impedance:	4 ohms
Maximum Output Level:	100mW 8 ohms
Standard Recording Level:	160nWb/m tape flux
Bias Frequency:	100kHz
Equalization:	3180 μ s + 70 μ s
Peak Level Indicator:	+8dB above 0VU
Power Requirements:	
USA, Canada:	120 VAC 60Hz 30W
Europe:	220 VAC 50Hz 30W
UK, Aus:	240 VAC 50Hz 30W
General Export:	100/120/330/240 VAC 50/60Hz 30W

TYPICAL PERFORMANCE

Frequency Response:	20Hz - 20kHz ± 0 dB (Electronics) 40Hz - 14kHz ± 3 dB, 0VU (Record/Reproduce) ² 40Hz - 16kHz ± 3 dB, -10VU (Record/Reproduce) ²
Total Harmonic Distortion (THD):	0.05%, 1000Hz, 0VU (Electronics) 1%, 400Hz, 0VU, 160nWb/m (Record/Reproduce) ² 3%, 400Hz, 6dB above 0VU, 320nWb/m (Record/Reproduce) ²
Signal to Noise Ratio²: (Reference, 3% THD Level)	with *dbx NR: Better than 95db IHF A Weighted Better than 90db Unweighted, 20Hz - 20kHz without dbx NR: Better than 54db IHF A Weighted Better than 52db Unweighted, 20Hz - 20kHz
Wow and Flutter¹:	0.04% RMS (JIS/NAB, Weighted) ¹ $\pm 0.06\%$ Peak (DIN/IEC ANSI, Weighted) ¹
Adjacent Channel Separation²:	70dB, 1000Hz, 0VU with dbx 50dB, 1000Hz, 0VU, without dbx
Erase:	70dB, 320nWb/m at 1000Hz

Specifications were determined using TEAC test tape; (1) MXT-111; (2) MTT-5061

In these specifications, 0 dBV is referenced to 1.0 Volt rms. Actual voltage levels are also given in parentheses. To calculate the 0 dB = 0.775 Volt reference level (i.e., 0 dBu or 0 dBm in a 600 ohm circuit), add 2.2 dB to the listed dBV value; i.e., 0 dBV = +1.0 Volt = +2.2 dBu. Changes in specifications and features may be made without notice or obligation.

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