

Model 144 PORTASTUDIO

TASCAM CREATIVE SERIES



TEAC

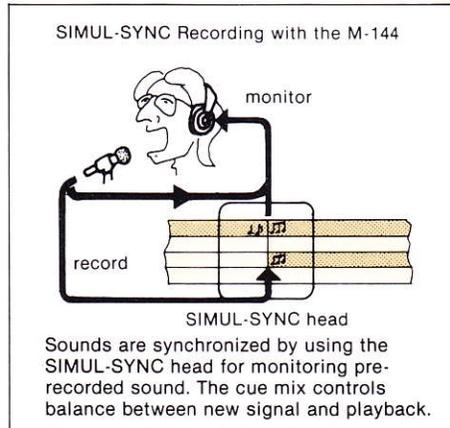
A COMPLETE 4-TRACK RECORDING SYSTEM

If you play a musical instrument, write or arrange songs, or are in any way involved with recording sound, the TEAC Model 144 Portastudio is the perfect way to expand your musical horizons. This revolutionary creative tool lets you record a number of instrumental and vocal parts on different tracks of the built-in 4-track recorder, and later blend all the parts together while transferring them to another standard 2-channel stereo tape deck (**remix and mixdown**), to form a stereo recording. The Portastudio mixer section is fully equipped to let you add echo and other effects as you record or mix down. And you don't have to record all the parts at once. First record one, then play it back and record the second part while monitoring the first, and so on. This way, you, alone, can create the sound of an entire band. You're not limited to just four tracks, either. You can record three tracks, then transfer them to the fourth track leaving the first three tracks open for further recording. The Model 144 also lets you perform "punch-in recording," with which you can re-record a section within a track that has already been recorded. For example, you can go back and re-record one line of a vocal part that needs improvement. With the TEAC Model 144 Portastudio, a couple of good mikes and a pair of headphones are all you'll need to record with all the creative flexibility of more expensive multitrack recording systems. And if you'll be doing all your recording with synthesizers or electronic instruments, you won't even need the mikes. The Portastudio accepts the output of electric instruments "directly."

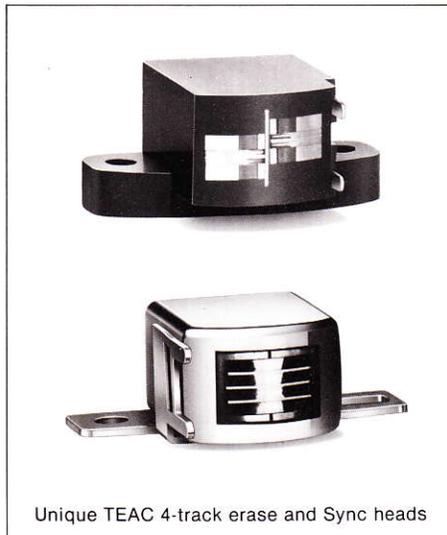
That's *real* integrated convenience.

SIMUL-SYNC: THE KEY TO CREATIVE RECORDING

Most of today's recorded music is created through the multitrack recording process. That is, not all the parts are necessarily recorded at the same time. First, the rhythm section alone may be recorded, then a brass section, then strings, and finally the vocal and lead instrumental parts (**overdubbing**). Once all the parts have been recorded on separate tracks of the tape, they are all "mixed" down to their final stereo format.



This process, however, requires a special Simul-Sync record/playback head that permits simultaneous monitoring and recording of individual tracks on the tape via the same head. The Model 144 4-channel record/playback head has been precision engineered specifically for this

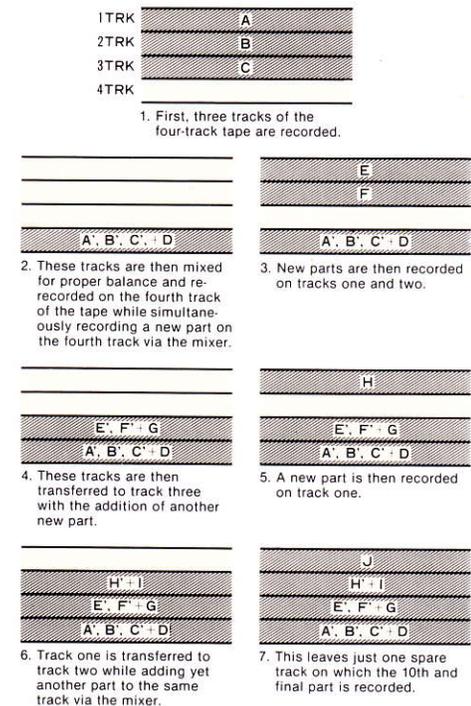


purpose. Advanced design and construction techniques have resulted in a Simul-Sync head that provides optimum performance in both record and playback modes. Individual tracks can be selectively set to the record or playback mode without affecting the performance of either mode. This unique feature also lets you effectively record more tracks than provided by the Model 144's basic 4-track format (**Ping-Ponging**, described in the next section). The main requirements for multitrack recording, therefore, are a deck with Simul-Sync capability, and a mixer that lets you control and route the music signals to solve the problems of multitrack operation.

"PING-PONG" TRACK TRANSFER

Although the Model 144 offers only four tracks on the tape, it is possible to record more than four signals with virtually no degradation of the sound quality of the final recording. By systematically mixing and transferring recorded tracks onto a spare track, tracks are opened up for further recording. Up to 10 individual tracks can be recorded in this manner with each being transferred from track to track no more than once, so tape hiss built up through transfers is minimal.

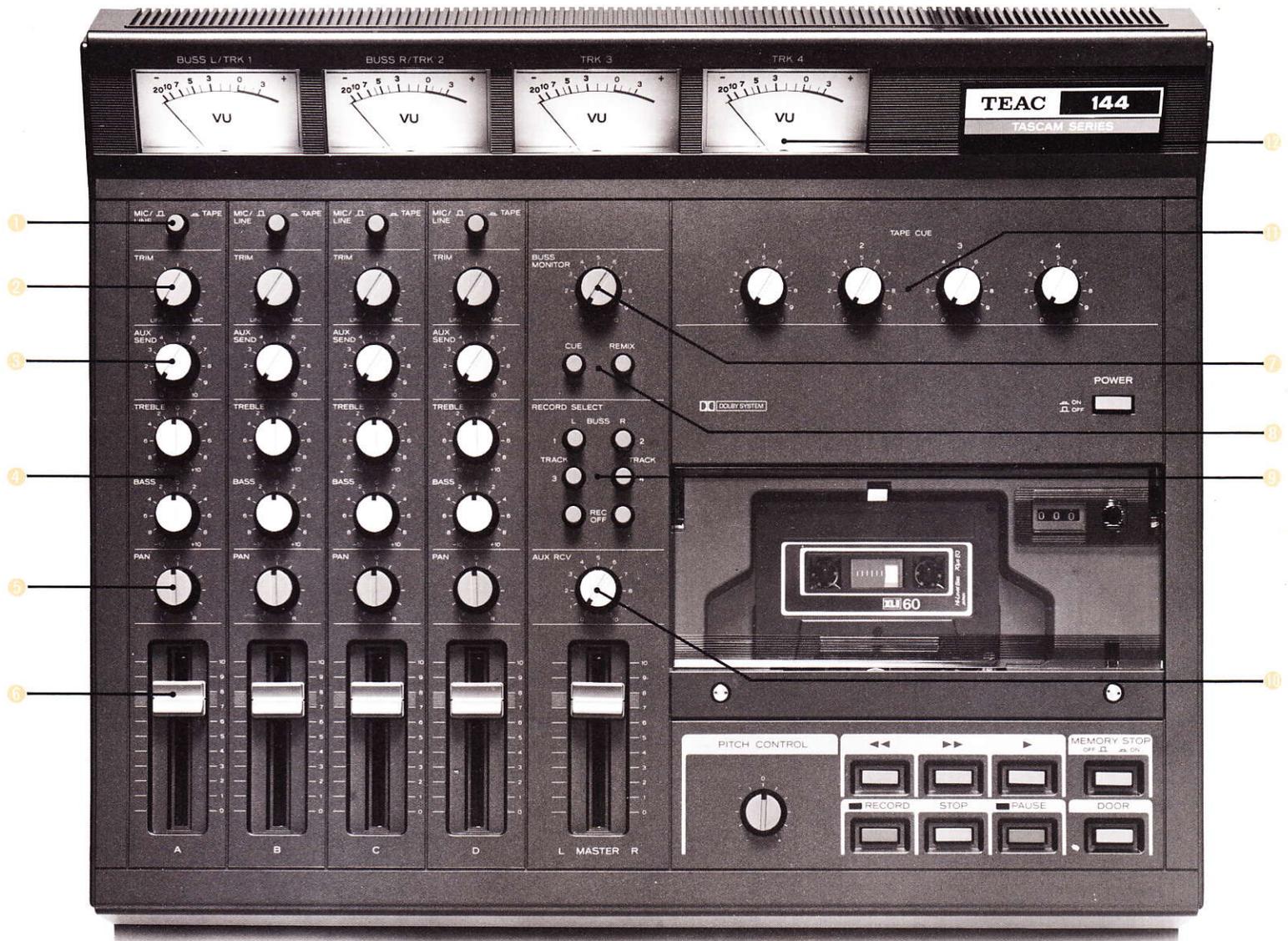
The following diagrams illustrate this process.



THE MIXER

In multitrack recording, the mixer must allow you to solve the problems that are unique to the process. In multitrack, you usually need more than one "mix." For example, if you don't want the same amount of "echo" on everything, you will need a separate mix for "effects" (AUX). You must have a way to get a microphone signal to a tape track (buss L + R). And, perhaps the most important mix of all, the monitor. You must be able to hear the signal in order to control it. Once the first track is record-

STUDIO IN ONE COMPACT PACKAGE



ed the monitor system must be capable of “playback” and “record” monitoring at the same time. Without this two way street in the monitor, an overdub can’t be made.

The Model 144 mixer has been specifically designed for the requirements of the multitrack process. It offers all of the multitrack control features found on professional mixing consoles.

Here’s a brief rundown of the main functions:

1 Mic/Line—Tape Selector

Determines whether the input to the channel is microphone, line, or playback from the built-in recorder.

2 Trim

This control varies the gain (amplifica-

tion) of the first stage amplifier, letting you adjust for optimum performance with a wide range of input sources.

3 AUX Send

The signal level sent from the input channel to the rear-panel AUX Send jack is adjusted by this control. This is particularly useful when you want to selectively add controlled echo or other effects to any or all of the input channels.

4 Bass and Treble Controls (Equalizer)

With the Portastudio, you make the decisions. We’ve given you plenty of flexibility by providing independent equalization controls for each channel. That means you can “color” individual tracks as you record, overdub and mix

down. Center position of both controls provides a flat response.

5 Pan

The Pan pots (Panoramic Control Potentiometers) let you independently position individual tracks anywhere from extreme left to right in the stereo sound field. During mixdown, you can rearrange the band and place the instruments anywhere you like.

6 Input Channel Fader

Controls the level of the signal from either the channel input jack or the respective channel of the built-in recorder, depending on the setting of the Mic/Line—Tape selector.

7 Buss Monitor

This controls the level of the signal

sent to the monitor headphones from the L + R buss master.

• Cue and Remix Buttons

The Cue and Remix buttons let you select a mono monitor mix from the existing tracks and tracks being overdubbed during recording, or from the mixer busses only for monitoring your stereo mixdown.

• Record Select Switch Matrix

These switches let you send the input signals to either one or both of the mixer's busses (Buss L and Buss R). Tracks 1 and 3 of the recorder are fed by the left buss, and tracks 2 and 4 are fed by the right buss. For recording, you can select any single track, or any combination of one left buss and one right buss track.

• Aux Receive

The levels of the signal input at the Aux In jacks are simultaneously adjusted by this control. Aux Receive is useful for returning echo or effects back into the program or for adding the outputs of an auxiliary mixer to the Portastudio.

• Tape Cue

Corresponding to tracks 1 through 4, these controls let you create an independent mono mix from any existing tracks. The mix is fed to the Cue Output jack at all times, and to the headphones when the Buss Monitor Cue button is engaged.

• VU Meters

In addition to accurately displaying record and playback levels, the Portastudio's VU meters are selectively illuminated or dark to indicate the unit's operating mode. When all Record Selectors are disengaged (Playback mode), all four meters are illuminated and active, showing the playback levels from each of the built-in recorder's outputs. When any of the Record Selectors are engaged (Record mode), either one or both of the Buss L/Trk 1 and Buss R/Trk 2 meters will be illuminated depending on whether one or two record channels are selected by the Record Select switch matrix.

THE RECORDER

The Portastudio's 4-channel multitrack cassette recorder is the first of its kind. And it is based on our extensive ex-

perience in the multitrack recording field. It provides sound quality and performance comparable with the best separate component decks, and is packed with advanced TEAC tape technology for maximum reliability and durability under virtually any conditions. In order to maintain reproduction quality standards as high as possible, the Portastudio's built-in recorder runs the tape at twice normal speed: 3-3/4 ips rather than 1-7/8 ips. In addition, the electronics are precisely calibrated for optimum performance with high-bias, 70-microsecond (EQ) tapes. There's even a 4-channel Dolby* noise reduction system built in so tape hiss and noise are reduced to a minimum. The 2-motor transport is activated by advanced logic control circuitry via light-action, short-throw function buttons. You can switch directly between all operating modes without fear of damage to the tape or transport. A memory rewind stop function is also provided, making it simple to relocate a precise spot on the tape for overdubbing or remix. And for an added touch of convenience, a pitch control lets you vary the speed of the transport by $\pm 15\%$ to "tune" the pitch of already recorded tracks to live instruments, or to create special effects by recording "off speed." The control works in the record mode as well as playback.

THE REAR PANEL

The Portastudio rear panel provides the following inputs and outputs:

• Inputs A, B, C, D

These inputs accept unbalanced microphone or line input levels with an impedance of from 50 to 10,000 ohms. Inputs A, B, C, and D correspond to channels A, B, C, and D of the Portastudio's mixer.

• AUX Send

This output jack carries a mono mix of the four input channel signals, as determined by the settings of their AUX Send controls. The signal from this output can be sent to an echo device or other effects unit.

• AUX In

An extra stereo source can be added to the left and right busses via these jacks. The output of the echo or effects unit can be connected here.

• Tape Cue

The mono mix created by the four Tape Cue controls is carried by this jack. This output can also be used as a pre-fader echo or effects send during stereo mixdown.

• Line Out and AUX Out

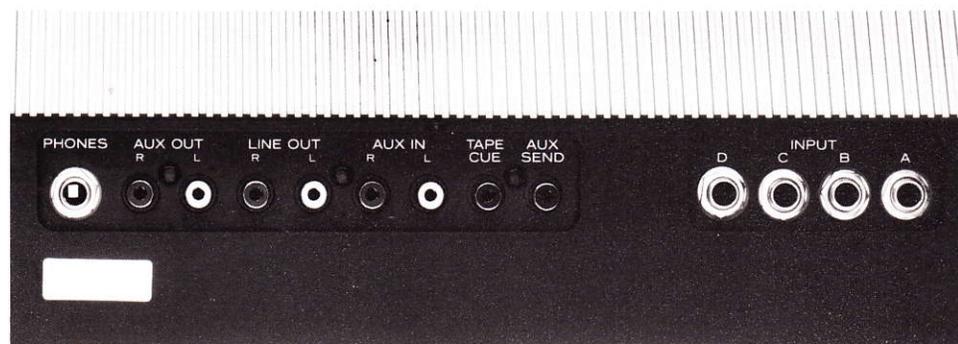
These pairs of jacks feed a line-level program mix from the left and right busses to a monitor amplifier or tape recorder. The output signals are duplicated by the AUX Out and Line Out jacks so the same stereo program can be sent to two different places: e.g. a monitor amp and a tape recorder.

• Phones

This jack accepts 8-ohm or higher stereo headphones for convenient monitoring.

THE LAST WORD

The TEAC Model 144 Portastudio brings top-quality creative recording capabilities within reach of the home studio enthusiast and serious musician/engineer—with unprecedented economy and portability. As in any serious audio system the last words are often the first considerations. The specs. Here are the numbers, signal flow charts, block diagram, and back panel plug layouts for the Model 144. Take your time, there's a lot to look at here.

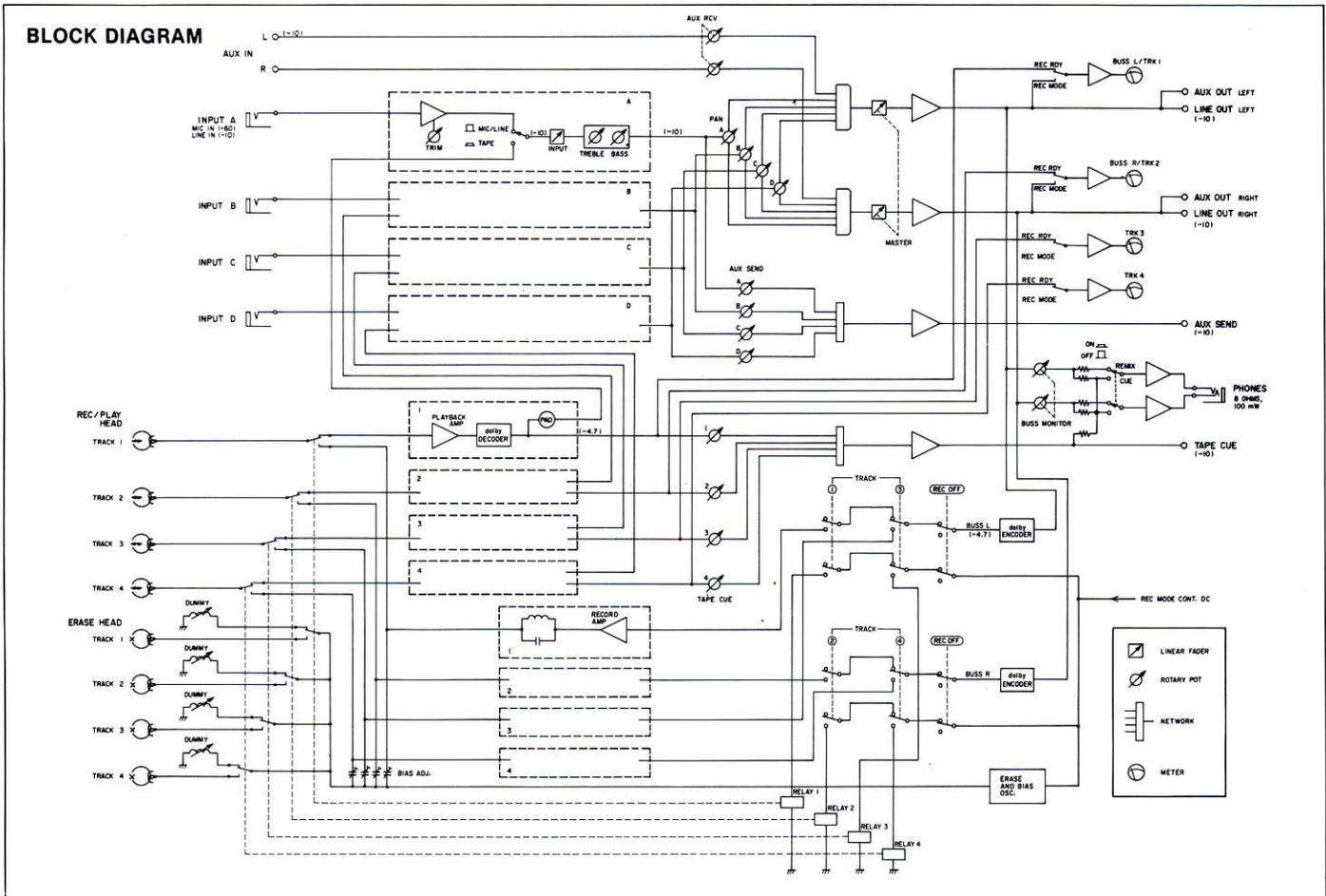


SPECIFICATIONS

MIC/LINE INPUT (x4)	
Mic or Line Impedance:	10 k ohms or less
Input Impedance:	60 k ohms
Nominal Input Level:	MIC -60 dBv (1 mV); LINE -10 dBv (0.3 V)
Minimum Input Level:	-66 dBv (0.5 mV)
Maximum Input Level:	+8 dBv (2.5 V)
AUX INPUT (x2)	
Input Impedance:	65 k ohms
Nominal Input Level:	-10 dBv (0.3 V)
LINE OUTPUT (x2), AUX OUT (x2)	
Output Impedance:	200 ohms
Load Impedance:	10 k ohms or higher
Nominal Output Level:	-10 dBv (0.3 V)
Maximum Output Level:	+15 dBv (5.6 V)
HEADPHONE OUTPUT (Stereo)	
Load Impedance:	8 ohms or higher
Maximum Output:	100 mW @ 8 ohms
TONE CONTROLS	
Treble:	Variable ± 10 dB @ 10 kHz
Bass:	Variable ± 10 dB @ 100 Hz
RECORDING TAPE:	
	Compact cassette, C-30/60/90—use a tape that requires high-bias level and 70-microsecond EQ:
	TDK-SA, MAXELL UDXL-II, AMPEX Grand Master II, Scotch Master II
RECORD TRACKS:	
	4-track, one direction (Special format)
RECORD CHANNELS	
(Electronics)	2 with full-time Dolby* encoding (switchable to the 4 record tracks)
PLAYBACK CHANNELS:	
	4 with full-time Dolby* decoding
NORMAL TAPE SPEED:	
	3 ³ / ₄ ips $\pm 1\%$

PITCH CONTROL (VSO):	$\pm 15\%$ of normal tape speed
RECORDING TIME:	15 minutes for C-60
HEADS:	4-channel erase (ferrite/permalloy); 4-channel record/playback (permalloy)
MOTORS:	1 FG servo-controlled DC capstan motor and 1 DC reel motor
WOW & FLUTTER:	$\pm 0.06\%$ peak, weighted; 0.04% RMS, weighted (measured with flutter test tape)
FAST WIND TIME:	70 seconds for C-60
FREQUENCY RESPONSE	
Mixer Section:	20 Hz—20,000 Hz
Recorder Section:	20 Hz—18,000 Hz (40 Hz—12,500 Hz ± 3 dB @ 0 VU)
TOTAL HARMONIC DISTORTION	
Mixer Section:	0.3% @ 1,000 Hz, nominal level
Recorder Section:	2% @ 315 Hz, 0 VU (overall)
SIGNAL-TO-NOISE RATIO	
Mixer Section:	68 dB weighted, mic in to line out (any channel)
Recorder Section:	63 dB, weighted (ref. to 315 Hz, 250 nanowebers per meter)
CROSSTALK	
Mixer Section:	65 dB @ 1,000 Hz
Recorder Section:	50 dB @ 1,000 Hz
ERASURE:	65 dB @ 1,000 Hz
POWER REQUIREMENTS:	
	100/117/220/240 V AC, 50/60 Hz
	117 V AC, 60 Hz (U.S.A. CANADA)
DIMENSIONS: (W x H x D)	
	460 x 120 x 370 mm
	(18-1/8" x 4-3/4" x 14-5/8")
WEIGHT:	Net, 9 kg (20 lb); Shipping, 10 kg (22 lb)

Improvements may result in changes of features or specifications without notice.
 *Dolby is a trademark of Dolby Laboratories.



ACCESSORIES

TEAC ME-50 Electret Condenser Microphone

The ME-50 is unique in medium priced microphones. It has a 2-position response switch and a cardioid pick-up pattern. By changing one internal connection and changing the plug, you can convert it to low impedance, balanced operation. You'll find the ME-50 an excellent value when you need outstanding performance at a medium price.

TEAC ME-80 Electret Condenser Microphone

The ME-80 is the perfect complement to your home or studio rig. It comes with two wind screens and a 15' balanced cable with XL-type connectors. And, of course, the performance characteristics are excellent.

TEAC ME-120 Electret Condenser Microphone

The ME-120 has the smoothest response in the entire ME Series. It has interchangeable omni-directional and cardioid elements. And with the 2-position response switch, you can instantly change the equalization for voice or music. In the music position you'll get a flat response. In the voice position you get 6 dB/octave attenuation, beginning at 250-300 Hz. A 15' balanced cable with XL-type connectors is supplied.

TEAC ME-20 Electret Condenser Microphone Cardioid Type

TEAC RMK Recorder Maintenance Kit

TEAC's Recorder Maintenance Kit has what you need to keep your tape recorder up and running. Head Cleaner to prevent loss in frequency response and unnecessary wear. Rubber Cleaner/Conditioner to prevent wow and flutter problems due to hardening, cracking and loss of roundness in rubber parts. Stainless Polish keeps exposed metal work gleaming. Head Cleaner, Rubber Cleaner/Conditioner and Stainless polish are also available separately in 2 oz. bottles and economy size cans.

TEAC E-1 Head Demagnetizer

For your recorder, you should own TEAC's E-1 Head Demagnetizer. Here's why: during normal use, residual magnetism accumulates on the head and guides. That can cause noise, distortion, and partial erasure of your tapes. Used often, TEAC's Head Demagnetizer removes residual magnetism and keeps your tape recorder recording and playing its best.



ME-50
Electret
Condenser
Microphone



ME-80
Electret
Condenser
Stereo
Microphone



ME-120
Cardioid
Dynamic
Microphone



ME-20
Electret Condenser
Microphone
Cardioid



RMK
Cleaner Kit



RCK
Cleaner Kit

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