

TASCAM Multitrack Series

MULTITRACK RECORDERS, MIXING CONSOLES, MASTER RECORDERS & ACCESSORIES

TEAC®



*The finest selection of
multitrack recording
equipment for the
creative musician and
sound engineer.*



THE WORLD OF MULTITRACK RECORDING

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Archiv Michael-Otto*





The word "Multitrack" describes a relatively new recording art. An art that has become indispensable in creating virtually all of today's recorded music. The reason for its importance in the recording field lies almost entirely in creativity and flexibility. Multitrack techniques simply give the artist, producer and recording engineer vastly wider scope in creating the sound they want. In contrast with the early days of recording when mono, two- and three-track tape machines were the mainstay of any studio, today's multitrack studio equipment is extremely complex, bulky and expensive. A visit to any large recording facility will confirm this—rooms lined wall-to-wall with consoles, racks and impressively large tape machines with a multitude of dials, lights, switches and meters that appear totally confusing to the uninitiated.

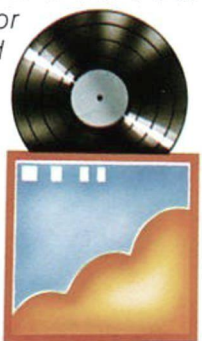
But what about the recordist who wants to take advantage of the superior creative flexibility of multitrack?

This is no small problem to the many amateur, semi-pro and professional musicians and sound engineers who have at one time or another been faced with the prohibitive cost of professional studio time and equipment. Here is where the

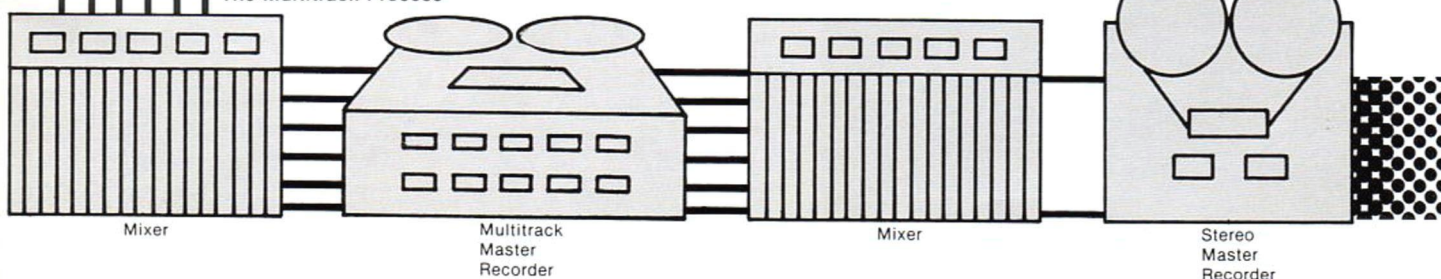
Tascam Multitrack Series acts as an important link between the independent artist and the world of major music production. Tascam offers a full line of multitrack equipment including recorders/reproducers, mixers and accessories with which you can put together a complete 4, 8, or 16 track studio capable of turning out commercial quality master tapes. In fact, many professional musicians and engineers have turned to Tascam equipment as the most practical means of creating their demo and master recordings as well as test tapes of original compositions, and even tapes for play-along practice—in the relaxed atmosphere of their own studios. The entire Tascam line is designed and constructed to professional standards, but priced within reach of a wide spectrum

of home recording enthusiasts. We're not new to the tape recording field, either. For more than a quarter of a century TEAC has been involved in the production of tape equipment for home entertainment, computer data storage, scientific data recording, low speed logging, and video. The experience and know-how gained over these years goes into every product we make, so you're assured of the highest quality, reliability, and durability under virtually any conditions. Your TEAC Tascam studio, whatever its size or complexity, will continue to provide superior sound and reliability even after many years of use.

And all Tascam equipment is designed for upward expandability, so your studio can grow with your recording needs. The TEAC Tascam Multitrack series may be your answer to success in the growing field of modern music and recording.



The Multitrack Process



Final Stereo Recording

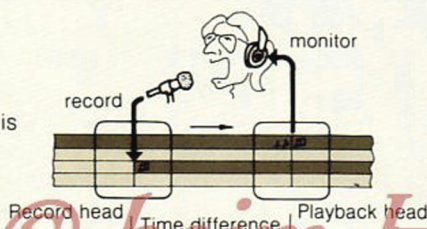
THE MULTITRACK RECORDER

A multitrack recorder is basically a tape deck on which 4, 8, 16, or more independent tracks are recorded in one direction on a single reel of tape. Any (or all) of the tracks can be recorded first, then later played back and monitored while recording new tracks. This last function requires a special "sync" capability so that the initially recorded tracks and "overdubs" (new tracks recorded while monitoring the initial tracks) are in synchronization when the entire tape is played back. This type of recording cannot be performed on

multitrack master tape, the recording engineer, producer and artists have extensive control over the sound and quality of the final recording. If any tracks are not quite up to standard, they can simply be re-recorded later, without having to retake the entire band. A number of microphones can be used to record individual parts of an instrument—drums, for example—on separate tracks so they can be mixed for proper balance or a full stereo effect later on. Even short segments of a track can be re-recorded

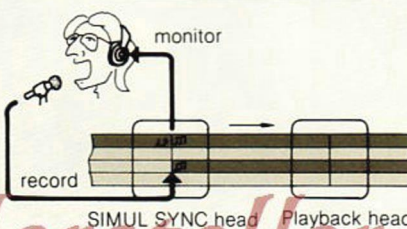
Ordinary Recording

Time difference in sounds occurs because recording is made while monitoring pre-recorded sound with playback head.



SIMUL SYNC Recording

Sounds are synchronized by using the SIMUL SYNC (record) head for monitoring pre-recorded sound.

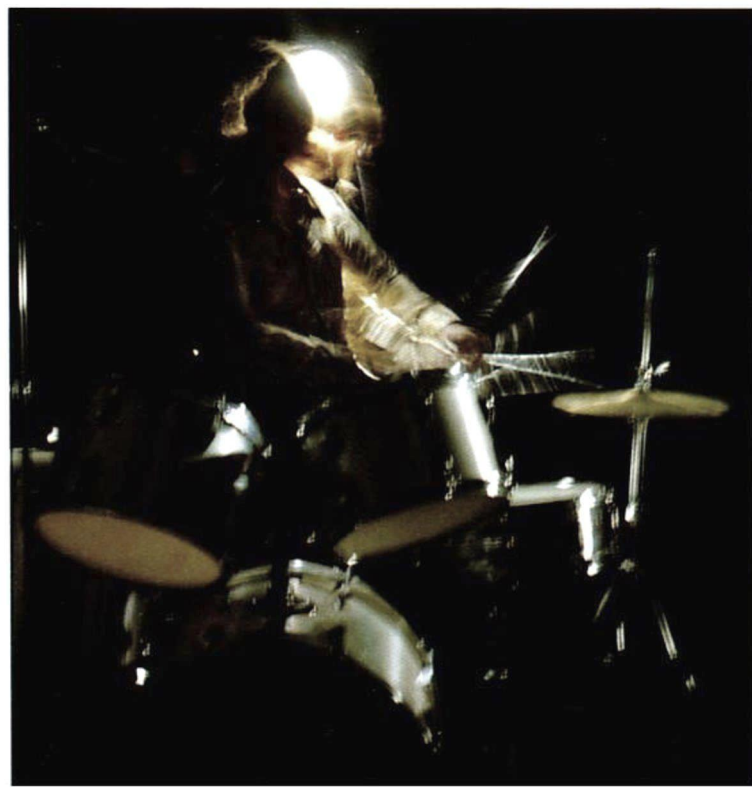


a standard tape deck because of the physical distance between the record and playback heads. This separation of the heads creates a time lag between the signal being recorded and that being monitored, so each overdub on the resultant recording will be slightly, but audibly, delayed from those previously recorded. On a true multitrack deck, monitoring and recording are performed via the same head, thereby maintaining perfect synchronization of all tracks.

Multitrack Multi-Benefits

By recording each instrument on a separate track of the

using a technique called "punch-in recording." Once the multitrack master has been recorded each track can be individually tailored for optimum balance, equalization, and location in the stereo sound field. Echo and other special effects can also be applied, in carefully controlled amounts, to any selected tracks. For the amateur recordist there are even further advantages: if you don't have enough mikes or studio space to handle the entire band, you can simply record a section at a time. But even more important, with a 4 or 8 track machine plus a little care and creativity, you should be able to obtain professional results.



Some Multitrack Functions

Basically, the only difference between a multitrack deck and a standard stereo machine is Simul-Sync and the number of tracks (plus the fact that recording is only carried out in one direction). On a multitrack machine, each channel has its own controls and inputs/outputs: VU meters, level controls, record mode and monitor selectors. The record mode selectors determine the status of each track. In the "Ready" mode, recording will begin on the selected tracks as soon as the main Record button is engaged. In the "Safe" mode, however, recording is inhibited even if the main Record button is accidentally engaged. The Monitor or Output Select buttons determine whether you monitor via the playback head, the Sync head when making overdubs, or the input source when setting up record levels.

Some decks also have a Cue button that lets you hear material on the tape during fast forward or rewind so you can easily locate a specific section of the recorded program. There are a variety of other functions that vary from machine to machine. It's up to you to choose the deck that is most appropriate for your needs.

A-2340SX

4-CHANNEL MULTITRACK RECORDER/REPRODUCER

One of the longest-standing members of our multitrack recorder/reproducer lineup, and one of the most economical, the A-2340SX is a fine choice for your first small studio. It offers all the important multitrack functions you need to create top-quality master tapes, as well as 7" reels and dual-speed operation for maximum tape economy.



Full Simul-Sync Capability

Like many larger machines, the A-2340SX has independent Simul-Sync/Normal switches for each of its four tracks. When any of these switches are in the Simul-Sync position, the record head functions as a Simul-Sync monitor head for the selected tracks. Tracks set to the Normal position function for normal recording, and the signal can be monitored via the playback head for mixdown or just plain listening. The Simul-Sync/Normal switches are conveniently located on the head cover for easy access and error-free operation. Independent Source/Tape (Monitor) selectors are also provided for each track. The Source position makes it simple to set up record levels before recording without running the tape, and lets the performers hear themselves when overdubbing.



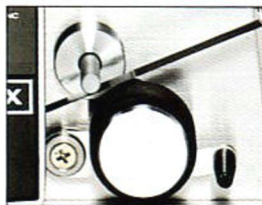
Eight-Source Mic/Line Mixing

The A-2340SX lets you mix as many as 8 signal sources at one time (4 microphone and 4 line sources) for flexible recording. Each of the four mike and line inputs has its own level control for accurate balancing of the

combined signals. This system permits versatile connection with your studio mixing setup.

Manual Cueing Lever

Usually found only on bigger, professional decks, the A-2340SX features a manual cueing lever that defeats the tape lifters during fast forward or rewind so you can hear the program on the tape to locate a desired passage or cue. The tape reels can also be rotated manually for precise cueing and editing.



Micro-Touch Logic Control

All transport functions on the A-2340SX are controlled by short-throw, fast-acting microswitch buttons. This makes even precisely timed overdubbing operations smooth and easy. An optional remote control unit (RC-120) is available for the A-2340SX that lets you operate the transport from up to 16 feet away from the deck.

Other Features

The A-2340SX has many more handy features that make it a top choice for performance and convenience. Independent bias and equalization selectors give you optimum performance with a wide range of tape formulations, expanded-scale VU

meters for each channel help you set precise record levels, independent output level controls for each channel let you match the deck's outputs to the inputs of your mixer for maximum signal-to-noise ratio, a 2-channel/4-channel selector lets you enjoy conventional stereo tapes, and an automatic tape-end shutoff means no more flapping tape when the reel runs out.

A-2340SX Specifications

Tape format	quarter-inch, 4 tracks
Reel size	7" and 5"
Tape speed	7 $\frac{1}{2}$ ips and 3 $\frac{3}{4}$ ips
Line input	100 mV Impedance: 50 k ohms, unbalanced
Line output	0.3 V Load impedance: greater than 10 k ohms, unbalanced
Equalization	NAB standard
Speed accuracy	$\pm 0.5\%$
Wow and flutter	0.08% RMS(NAB), weighted at 7 $\frac{1}{2}$ ips 0.10% RMS(NAB), weighted at 3 $\frac{3}{4}$ ips Measured with flutter test tape
Overall frequency response	40 Hz—18 kHz, ± 3 dB at 7 $\frac{1}{2}$ ips 40 Hz—10 kHz, ± 3 dB at 3 $\frac{3}{4}$ ips
Signal to noise	55dB weighted, referenced to 3% T.H.D. level
T.H.D. overall	1% at normal operating level
Crosstalk	greater than 50 dB at 1 kHz
Power req.	100/117/220/240 V AC, 50/60 Hz, 110 W
Dimensions (W x H x D)	17 $\frac{1}{4}$ " x 18 $\frac{3}{4}$ " x 8 $\frac{3}{4}$ "
Weight	21 kg [48 lbs. 4 oz.] net

*Improvements may result in changes of features or specifications without notice.

A-3440

4-CHANNEL MULTITR

For a combination of economy, easy operation, and all-round multitrack recording flexibility that can't be beat, the A-3440 four-track recorder is an ideal choice. It offers many of the first-rate features found on our larger multitrack machines, plus a choice of 7-1/2 or 15 ips tape speeds. Naturally, you get the same professional sound quality provided by all Tascam multitrack recorders/reproducers.

Function and Output Select

The usual confusing array of Rec Mode, Sync and Monitor switches found on many multitrack recorders has been simplified in the A-3440 to two groups—Function and Output Select. This comprehensive, human-engineered system reduces the number of switching operations required to set up record and sync channel assignments.

The Output Select group has Source, Sync and Play buttons. The Source button routes input signals to the deck directly to the meters and output terminals for making preliminary record level adjustments and sound checks. The Play button activates the playback head for direct monitoring of the signal being recorded. And the Sync button activates the Sync or Source monitor mode depending on the setting of the Function Select buttons for each channel. With the Sync button engaged, engaging any of the Function Select buttons sets the corresponding tracks to the record mode, while all other tracks are in the Simul-Sync monitor mode.

Headphone Select

A unique feature of the A-3440 is its headphone monitor select matrix. This switching system lets you assign any desired track or combination of tracks to the headphone feed. This means you can make rough four-track recordings without a mixer—a handy feature for location work where



carrying your entire studio along would be impractical. The monitor select matrix also makes it fast and simple to identify individual tracks on the tape.



Pitch Control

The A-3440 pitch control lets you vary the speed of tape travel by $\pm 6\%$ (approx. $1/2$ -tone). In addition to making it easy to compensate for differences in the pitch of instruments recorded at different times, it opens up many possibilities for creating special effects.

When the pitch control is disengaged, the transport is locked precisely onto the 7-1/2 or 15 ips standard speeds as set by the speed selector.



ACK RECORDER/REPRODUCER



Optional dbx[®] Noise Reduction Interface

The A-3440 accepts the professional Type-I dbx noise reduction interface (RX-9). This compander (compressor/expander) type noise reduction system provides approximately 30-dB improvement in signal-to-noise ratio, and greatly expanded dynamic range. Since tape hiss and noise are virtually reduced to inaudibility, even the quietest passages on your recordings come through with exceptional clarity.

This kind of noise-free, wide dynamic range performance is just what you need for those all-important demo tapes.

Other Features

Four unbalanced high or low impedance microphone jacks are provided on the front panel for quick access when making recordings without a mixer. Each of the four input chan-

nels features a Mic-Att/Mic/Line selector and level control so setting up for any type of recording is quick and easy. The Mic-Att (-20 dB) position is ideal when using high-output microphones or when close-miking live instruments.

Depending on the setting of the Output Select group, the input or output levels of each channel are displayed by four expanded-scale, precisely calibrated VU meters. With a display range extending up to +5 dB, these meters provide an accurate reference even when using the optional dbx unit (which allows for higher-than-normal recording levels).

All transport functions are activated by Light-touch, fast-acting microswitches and logic control circuitry, and an advanced motion sensing system eliminates tape damage when switching directly between transport modes. There's even an optional remote control unit (RC-70) that can be placed near the mixer for convenient control of all transport functions.

A-3440 Specifications

Tape format	quarter-inch, 4 tracks
Reel size	10 $\frac{1}{2}$ " and 7"
Tape speed	15 ips and 7 $\frac{1}{2}$ ips
Line input	60 mV
	Impedance: 50 k ohms, unbalanced
Line output	0.3 V
	Load impedance: greater than 10 k ohms, unbalanced
Equalization	NAB standard
Speed accuracy	$\pm 0.5\%$
Wow and flutter	0.04% RMS(NAB), weighted at 15 ips 0.06% RMS(NAB), weighted at 7 $\frac{1}{2}$ ips Measured with flutter test tape
Overall frequency response	40 Hz—22 kHz, ± 3 dB at 15 ips 40 Hz—20 kHz, ± 3 dB at 7 $\frac{1}{2}$ ips
Signal to noise	55 dB weighted (NAB equalization), referenced to 3% T.H.D. level
T.H.D. overall	0.8% at normal operating level
Crosstalk	greater than 45 dB at 1 kHz
Power req.	100/117/220/240 V AC, 50/60 Hz, 125 W
Dimensions (W x H x D)	445 x 523 x 235 mm [17 $\frac{1}{2}$ " x 20 $\frac{1}{2}$ " x 9 $\frac{3}{4}$ "]
Weight	25 kg [55 lbs.] net

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**"dbx" is a trademark of dbx Incorporated.

80-8

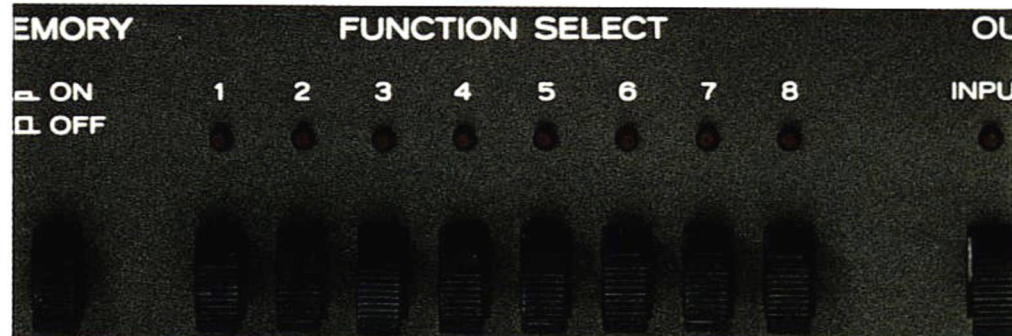
8-CHANNEL MULTITRACK RECORDER

The 80-8 15 ips/1/2" tape format recorder/reproducer brings true professional quality multitrack recording within reach of the non-professional enthusiast. It's the ideal machine for a wide variety of applications including recording master tapes for record albums, recording commercial spots, or doing production work for radio, TV or film.

In any application, you get superior sound quality, convenience and renowned TEAC reliability.

Accurate Reproduction

A quick look at the 80-8 specifications will tell you that it's a precision-engineered machine. Your ears, however, will tell you even more. Tascam recorders provide exceptionally flat response across a wide frequency range—from the lowest lows to virtually inaudible highs. And distortion is kept to a minimum so the reproduced signal is as close to a perfect copy of the original as possible. All this means that you get accurate tonal color and balance making it easier to control the final sound.



Function and Output Select

The 80-8's original Tascam Function and Output Select switching matrix makes setting up sync and record channel assignments quicker and easier than ever.

The Output Select buttons determine which of three signal sources will be fed to the recorder's line outputs and VU meters. An LED is illuminated to remind you that the corresponding button is engaged.

A Function Select button is provided for each track. With these buttons you can "punch in" or "punch out" of the record mode on selected tracks while the tape is running in the Sync/Record mode with absolutely no bias "click." You can also preset any desired tracks to record as soon as the main transport Record button is pressed.

Optimized Sync Head Performance

The 80-8's Sync head is an advanced design that provides optimum reproduction performance in both Record and Sync monitor modes. You

get full frequency response in the Sync mode so direct "ping-ponging" track transfer operations are possible. In addition, the 80-8 operates at only one tape speed: 15 inches per second. We chose this speed because our research showed that it provides a perfect blend of performance and economy compared to 7-1/2 ips or 30 ips formats. An optional variable speed controller (VSK-88) is available, however, if you need precise $\pm 10\%$ pitch control.

Convenient Operation

All function and mode controls are arranged in a human-engineered layout for greatest operation ease and minimum chance of operation error. The transport controls are grouped for one-handed operation—a feature you'll really appreciate when confronted with a tricky editing situation. There's even an optional remote control unit (RC-170) for extra operating convenience. Cleaning and maintenance of the heads is easy with a flip-up head cover that gives you full access for demagnetizing, etc. And a flip-down front panel provides access to the electronics (each channel on an independent plug-in circuit card) for testing and maintenance. By keep-



RC-170

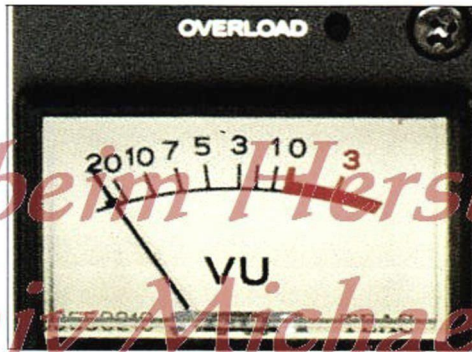
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ing a few spare cards handy, they can easily be swapped with malfunctioning cards so you don't lose any recording time.

Optional dbx® Noise Reduction

We offer an optional dbx noise reduction interface (DX-8) that has been designed specifically for the 80-8. Just plug it in and forget about it. All encode/decode switching is done automatically via the controls on the deck. This dbx system reduces tape noise to virtually inaudible levels, and increases dynamic range to the point where it's very difficult to tell the difference between a live and recorded performance.



sional sound engineers) and fast-responding peak level indication. Since transient peak levels can be considerably higher than average levels, the peak indicator LEDs help you set the optimum recording level for minimum distortion.



DX-8

Combined Peak/VU Level Monitoring

Each 80-8 VU meter incorporates a peak-indicating LED in the corner. This system gives you the best of both worlds: precise VU level indication (the system preferred by most profes-

High Tape Stability

A precision-engineered impedance roller, mechanical flutter filter, and tape guides all ensure optimum tape-to-head contact so you don't lose any high frequency response due to instability in the tape path.

Model 80-8 Specifications

Tape format	half-inch, 8 tracks
Reel size	10 $\frac{1}{2}$ "
Tape speed	15 ips
Line input	+10 dB (0.3 V)
Impedance:	greater than 20 k ohms, unbalanced
Line output	-10 dB (0.3 V)
load impedance:	greater than 10 k ohms, unbalanced
Record level	0 VU referenced to 3 dB above calibration
calibration	185 nWb/m of tape flux, adjustable
Equalization	IEC standard
Speed accuracy	$\pm 0.5\%$
Wow and flutter	0.04% RMS(NAB), weighted 0.06% peak(ANSI), weighted Measured with flutter test tape.
Starting time	less than 0.5 sec.
Overall frequency response, sync mode	40 Hz—18 kHz, ± 3 dB
Signal to noise	65 dB weighted, 60 dB unweighted, referenced to 3% T.H.D. level (10 dB above 0 VU) at 400 Hz
Distortion	1% at 400 Hz, 0 VU
T.H.D. overall	3% at 10 dB above 0 VU
Crosstalk	greater than 45 dB at 400 Hz
Erasure	greater than 65 dB at 1 kHz, +10 VU reference
Power req.	100/117/220/240 V AC, 50/60 Hz 200 W
Dimensions (W x H x D)	445 x 535 x 305 mm [17 $\frac{1}{2}$ " x 21" x 12"]
Weight	35 kg [77 lbs.] net

*Improvements may result in changes of features or specifications without notice.

**dbx is a trademark of dbx Incorporated.

85-16

16-CHANNEL MULTITRACK RECORDER

The 85-16 represents a major breakthrough in 16 track, 1" format tape recording. In many ways, it surpasses the already outstanding performance of its predecessors, and offers a number of new features that you will find exceptionally convenient. If multitrack recording is your business, the Tascam 85-16 is your best business machine.

Top-Level Reproduction Performance

The 85-16 offers flat frequency response from 40—18,000 Hz in both Sync and Repro modes. A combination of DC-coupled FET record amplifiers and an integral dbx* noise reduction system keep noise to an astonishingly low level. In addition, each and every unit undergoes a thorough quality control and test program before it leaves the factory assuring that your 85-16 will continue to provide professional performance even through the toughest use.

Simplified Recording and Overdubbing

The 85-16's original Tascam Function and Output Select switching matrix makes setting up sync and record channel assignments quicker and easier than ever.

The Output Select buttons determine which of three signal sources (Input, Sync, Repro) will be fed to the recorder's line outputs and VU meters. An LED is illuminated to remind you that the corresponding button is engaged.

A Function Select button is provided for each track. With these buttons you can "punch in" or "punch out" of the record mode on selected tracks while the tape is running in the Sync/Record mode. Advanced bias circuitry means that there is absolutely no "click" recorded on the tape during punch in operations. You can also preset any desired tracks to



record as soon as the main transport Record button is pressed.

Optimized Sync Head Performance

The 85-16's Sync head is an advanced design that provides optimum reproduction performance in both Record and Sync monitor modes. You get full frequency response in the Sync mode so direct "ping-pong" track transfer operations are possible. In spite of its unusual 16 track/1" configuration, the 85-16 Sync head provides exceptional channel separation so every track is totally independent with virtually no crosstalk from adjacent tracks.



Advanced Editing Functions

Through special logic circuitry, the Stop button performs two functions: press it once to stop the transport, a second time to enter the Edit mode.

In this mode the reproduce electronics are activated but the reel motors are disengaged so you can manually cue the tape for easy editing.

There's even a built-in auto-locator function. Just press the Search button and the tape will automatically fast wind and stop at the precise zero point. An optional Auto Cue unit (AQ-85C) lets you set five different search locations—a total of six including the return to zero function. Pressing either the Fast Forward or Rewind buttons twice activates a special "tape storage wind" mode in either direction.

Precise Fixed or Variable Tape Speed

The 85-16 runs at a precise 15 inches per second in the fixed speed mode thanks to an unfaltering direct-drive DC servo system. For "tuning" or special effects, however, tape speed can be varied by as much as $\pm 10\%$ with a built-in pitch control system. Tape speed is precisely displayed on a digital readout for easy reference.

Integral dbx Noise Reduction System

The 85-16 incorporates a custom-

DER/REPRODUCER



designed dbx noise reduction system that dramatically reduces tape noise and improves overall dynamic range. All encode/decode switching operations are automatically controlled via the deck's function buttons so operation is faster and less complicated than with conventional outboard systems. Cost is greatly reduced, too. The encode/decode circuitry for each channel is on independent circuit cards so replacement for servicing is fast and simple.

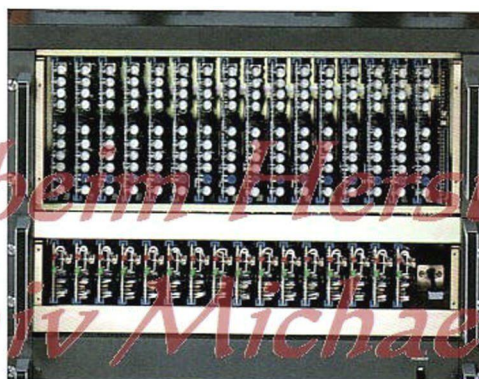
Smooth Tape Handling

The DC reel motors are precisely controlled by feedback from the takeup and supply tension arms so winding is smooth and free from tension irregularities. A photosensor unit built into the head assembly stops the transport automatically if the tape breaks or runs out.

A remote control unit (RC-15C) is also available for convenient off-deck transport control.

Convenient Modular Construction

Each section of the electronic circuitry—bias and record amplifiers, play amplifiers, and dbx encode/decode processors—is located on an independent circuit card accessible by removing the front panels. This greatly simplifies maintenance and minimizes down time. In addition, all trimmers are located at the front of each card for quick, easy alignment. Motion sensing and servo control circuitry is located on several circuit



cards accessible at the rear of the transport. These cards can also be easily swapped for servicing. The various card frames and transport electronics are connected by plug-in cables, and the entire unit can be disassembled for easy transportation.



The 85-16 is available in four types—A, B, C, and D—according to dbx system, line input/output level and impedance, described in the chart below.

	dbx	In/Out level, imp.
85-16A	x	-10 dBV/-10 dBV, 50 k ohms UNBAL.
85-16B	x	-10 dBV/-10 dBV, 50 k ohms UNBAL.
85-16C	x	+4 dBV/+4 dBV, 600 ohms BAL.
85-16D	o	+4 dBV/+4 dBV, 600 ohms BAL.

Model 85-16 Specifications

Tape format	15 tracks, 1-inch tape width
Reel size	10 1/2" maximum, NAB (large) hub only
Tape speed	15 inches per second; Variable, $\pm 10\%$ relative to 15 ips
Speed accuracy	$\pm 0.3\%$
Starting time	Within 1 second for rated speed and 3 seconds to reach RMS flutter of less than 0.05%
Wow and flutter	0.03% RMS weighted (NAB); $\pm 0.04\%$ peak weighted (ANSI); (measured with flutter test tape)
Overall frequency response	40 Hz—18,000 Hz ± 3 dB (Sync and Repro mode)
Total harmonic distortion (THD)	1% at 0 VU; 1,000 Hz
Record electronics headroom	28 dB or greater above nominal level at 1,000 Hz
Signal-to-noise	67 dB weighted or 62 dB unweighted with dbx noise reduction bypassed. 87 dB weighted with dbx noise reduction.
Crosstalk (any adjacent tracks)	Better than 45 dB down @ 1,000 Hz
Erase depth	75 dB or greater at 1,000 Hz
Input Level	-10 dB (0.3 V) nominal
Impedance	50 k ohms; unbalanced
Line output level	-10 dB (0.3 V) nominal; +18 dB (8.0 V) max.
Impedance	Greater than 10 k ohms; unbalanced
Connectors	RCA jacks for all inputs and outputs
Indicators	16 illuminated VU meters
Record Level Calibration	0 VU referenced to 250 nWb/m (nano Webers per meter) tape flux level IEC standard
Equalization	150,000 Hz.
Bias and erase frequency	2 DC servo-controlled reel motors; direct-drive DC Servo Capstan motor
Motors	100/117/220/240 V AC, 50/60 Hz, 350 W
Power mains	
Dimensions (W x H x D)	
Assembled Unit	615 x 1,090 x 550 mm [24 1/4" x 43" x 21 3/8"]
Weight	95 kg [209 lbs.] net

*Improvements may result in changes of features or specifications without notice.

**dbx is a trademark of dbx Incorporated.

THE MULTITRACK MIXER

At first, the multitrack mixer may seem like an extremely complicated piece of equipment, but on closer examination you'll find that it is mostly repetitious. Once you know the functions of most of the major controls, understanding the entire creative recording process is easy.

The multitrack mixer accepts a number of different inputs—line, microphone, or outputs from the multitrack recorder—and combines them into one or more outputs. Mixers are usually classified by the number of inputs and outputs they provide: 4-into-2 (4 x 2), 6 x 4, 8 x 4, 16 x 8, etc. Just about any combination is possible.

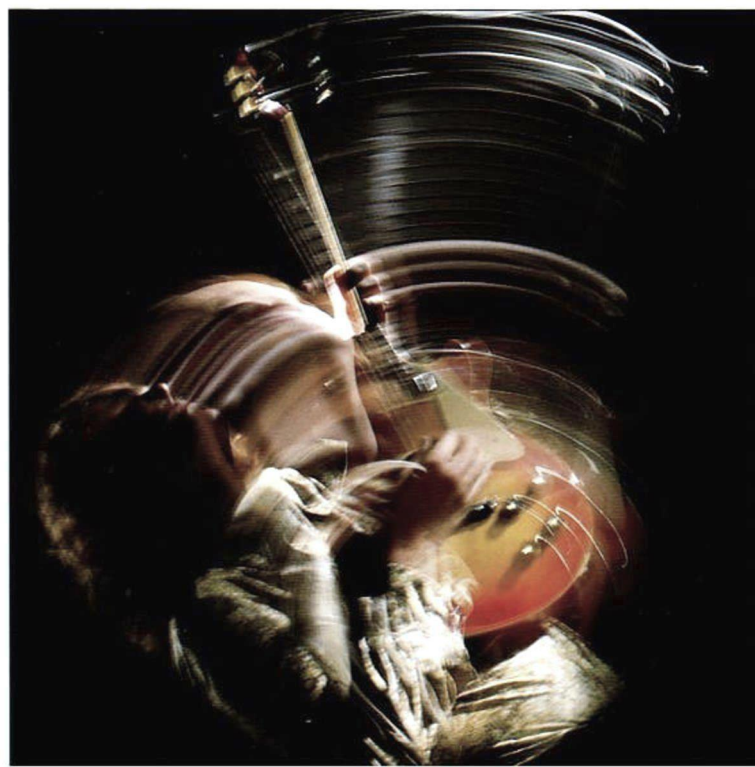
The mixer is the main creative control center for any multitrack recording operation. It should be flexible enough to allow individual control over the sound of each instrument or group of instruments, and full freedom in assigning the input channels to any output channel (or buss).

The following is a summary of some of the features you will find in a functional mixer.

INPUT SECTION

Input Selector

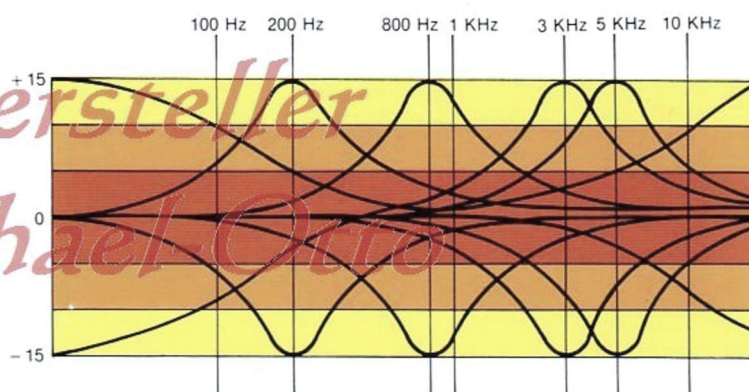
A practical mixer should provide for easy selection of microphone or line input to each input channel. In addition to this basic mic/line selector, Tascam mixers also provide a means of "padding" or attenuating the mike input signal so that high-output microphones cannot overload the input stage. On larger Tascam mixers, a "trim" control is also provided for continuous 0—20 dB padding of both line and microphone inputs.



Equalization

Each input channel should be equipped with some means of equalizing the signal to control room acoustics or correct for deficiencies in the instruments themselves. Equalizers can range from simple bass and treble controls to complex multiple peak/dip type controls with selectable center frequencies. The EQ can be used in two situations: when originally recording the sound on tape, and during final mixdown when the multitrack master tape is reduced to the stereo format. Most engineers prefer to record the original tracks "dry," or without EQ, and then add any necessary equalization during mixdown.

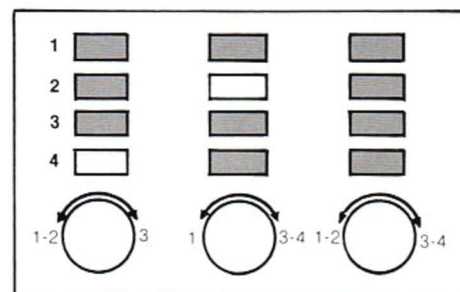
Typical equalizer response curves



Pan Pots

The pan pots let you build the desired stereo image by placing individual instruments anywhere from extreme left to right of the stereo sound field. With the pan pot turned all the way to the left, the signal from that channel will be sent to the assigned output, and turned all the way to the right, the signal will appear at another assigned output. Set anywhere in between, the signal is proportionately to both outputs. The outputs for which the pan pot functions are determined by the channel assignment switching matrix. The two assigned outputs can therefore be used as the left and right channels of a stereo program.

Tascam mixers offer an original panning system that is exceptionally comprehensive and versatile: when any two outputs are assigned by the switching matrix, the pan pot functions between them (1—2, 1—3, 2—4 etc.), while assigning more than two outputs automatically divides the selected outputs into



two groups between which the pan pot functions (1 & 2—3, 2—3 & 4, 1 & 2—3 & 4).

Channel (Buss) Assignment

A mixer with more than 2 output channels requires some sort of switching arrangement to send the inputs to one or more outputs. With a 4-output mixer, for example, you press the channel assignment buttons for track 1, 2, 3 or 4, or any combination of these, and the signal from the input channel is routed to the corresponding output(s). This saves the trouble of reconnecting the leads to the multitrack recorder whenever you want to send a signal to a different track or tracks.

Echo

Some type of echo or reverberation system will almost certainly become necessary for your multitrack recordings. Echo send and receive controls on the mixer will greatly simplify the job of assigning and controlling the echo effect. Some mixers have an echo send control for each input channel, and one or more receive controls for the output channels. This lets you control the amount of signal sent from each channel to the echo unit, and the amount of echo returned to the various outputs.

Cue

Cue is another extremely useful feature for multitrack work. A flexible system will include a cue control on every input channel and one for every tape output channel. These controls can be set to provide an independent "cue mix" for the performers in the studio. Since the cue mix does not affect the sound recorded on the tape, the performers can hear any balance they desire while recording and overdubbing. For example, the vocalist may want the piano to be louder, or may want to hear more of his own voice. All the cue signals are routed to a cue out jack on the rear panel of the mixer.

Input Faders

Each input channel of the mixer should have an independent fader control that lets you adjust the level of the signal sent to the assigned output channels.

OUTPUT SECTION

Master Fader

In some mixers, each output channel has an independent fader for output level control, and in others, one fader controls all the outputs without altering the balance between the output channels. More sophisticated mixers offer both systems, in which case the individual controls are called submasters.

Echo Receive

As mentioned previously, some mixers feature echo send and receive controls to facilitate adding controlled echo to selected tracks. Usually, each output buss will have an independent echo receive control that controls the amount of echo added to that channel from the echo unit. In some cases, a switching system is provided that allows the echo to be added to the monitor buss only, the program buss only, or both. With the echo receive system in the Monitor mode, you can hear approximately how the final balance will sound after adding echo, without affecting the tracks being recorded on the tape. The Program mode is used during final mixdown when echo is actually added to the recording.

MONITOR SECTION

Monitor Gain and Pan

The monitor gain controls, usually associated with each output buss, send an independent mix to the monitor buss for monitoring via the control room speakers (or headphones). When the monitor system is stereo, a pan control is often provided for each channel permitting location of the sound from each channel at any desired place in the stereo sound field.

Monitor Select

Since several signal sources can be derived from the mixer's program buss, cue buss, and the multitrack recorder's outputs, a useful feature in a mixer is the capability to switch the monitor system from one to the other for setting levels and comparison. The monitor selector often also features an Aux position for replaying the master tape or any other signals connected to the auxiliary inputs.

Solo

A solo button on each input is particularly useful for setting up the sound or trouble-shooting while recording. If, while recording, you hear some distortion, a crackle, or any other trouble in the program, there's no need to stop recording to find out where the trouble is. Simply press the solo button on each "live" input channel, and the sound on that channel is isolated so you can hear it alone without the distraction of the other channels. The track that is causing the problem can simply be re-recorded later on.

Although the above is a fairly complete list of features you will find on a good mixing console, it is by no means an indication of what you will find in every console. Depending on your recording needs, you may require less or more. Check out the Tascam line of multitrack mixing consoles—one is just right for your studio.

M-2A

Model 2A 6-IN/4-OUT MIXING CONSOLE

If you're looking for maximum flexibility with really outstanding economy, the Model 2A 6-in/4-out mixing console is just what you need. Designed primarily for versatile 4-track recording, the Model 2A is an ideal choice for your very first multitrack setup. And later on, as your studio grows, the Model 2A will keep right on working as a top-quality auxiliary mixer. If you just want to add more input capability, two Model 2A's can be cascaded to provide a 12×4 mixing system. Despite its surprising economy, the Model 2A is built to the same professional standards that go into our full-size multitrack systems. You get excellent

Top-Line Features

The Model 2A gives you surprising control for such a compact mixer. Each input has a selector that lets you choose line input, mike input, or mike input with 20-dB padding. And, like on many larger mixers, there's an equalizer section so you can tailor the sound to your specific requirements. The signals from each input channel are assigned to any of the four output channels via a channel assignment switching matrix. And a pan pot on each input lets you position the sound image from each channel anywhere from left to right in a stereo program. Overall output level of all four outputs is controlled by a single master fader.

If you need a headphone cue mix for the performers, the cue output jacks on each input channel of the Model 2A can be hooked up to an auxiliary mixer such as our versatile Model 1. And echo or any other effects can be patched into the output busses via accessory send and receive jacks.

With a Model 2A and a little imagination, you can produce even sophisticated multitrack recordings of exceptionally high quality.

MB-20 Meter Bridge

If you need convenient level monitoring of the four output busses

and a little more flexibility than provided by the Model 2A. The MB-20 Meter Bridge is an extremely useful accessory. It enables you to monitor the buss output levels via four accurate VU meters that can be set to read 0 VU at -20, -10, -2, or +4 dB. An LED in each meter indicates transient peaks that are too fast for the meters to follow. The MB-20 also features a built-in 4 x 2 monitor system with a swit-

ching matrix that assigns the buss outputs to left, right or center of the stereo monitor mix. There's even a built-in headphone amplifier with level control so you don't need a separate amp for monitoring.

And since the MB-20's inputs have bridging outputs, you don't lose any system flexibility.

The MB-20 is also useful in larger systems for general monitoring of line level signals.



Input Section



reproduction quality, reliability you can depend on, and durability that will keep your mixer going strong even after years of use. The Model 2A's compact size and light weight have their own distinct advantages: you can pack up your mixer and deck and take them anywhere for professional quality results on location.



MB-20 Specifications

Input/Output Level	-20 dB (0.1 V), -10 dB (0.3 V), -2 dB (0.78 V), +4 dB (1.23 V), switchable
Input Imp.	Greater than 100 k ohms
Tape in Level	-10 dB (0.3 V)
Tape in Imp.	Greater than 50 k ohms
Mon. Out Level	-10 dB (0.3 V)
Mon. Out Load Imp.	Greater than 10 k ohms
Headphone	Load Imp. 8 ohms, 100 mW
Power Requirements	100/117/220/240 V AC, 50/60 Hz, 8 W

Model 2A Specifications

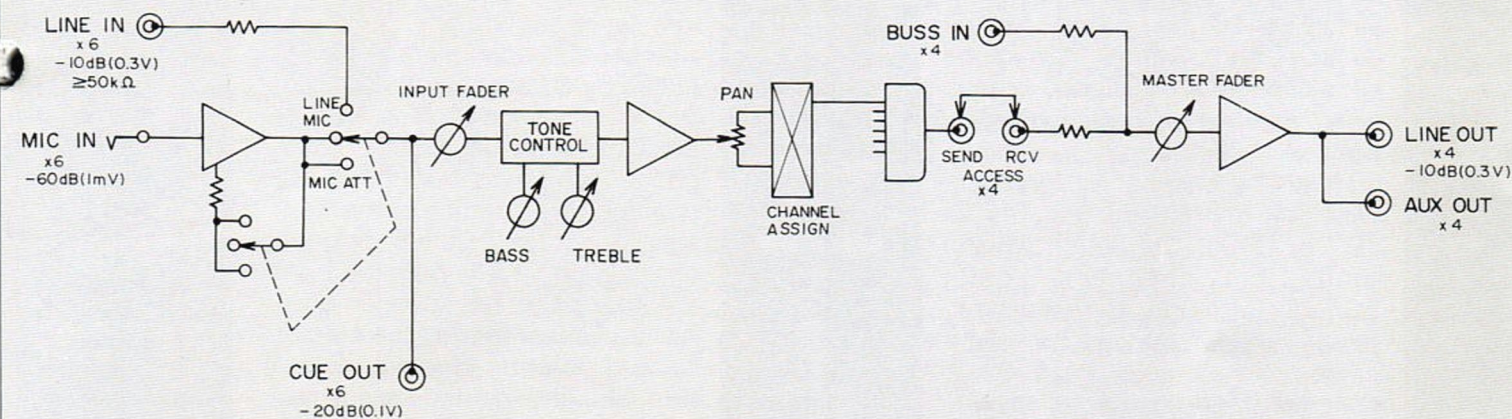
Input selector	MIC ATT/MIC/LINE
Mic input	
Mic impedance	150—10 k ohms

Input impedance	greater than 50 k ohms
Nominal input level	-60 dB, Hi-Z input
Line input	
Line impedance	greater than 20 k ohms
Input level	-10 dB (0.3 V)
Line output/Aux. output	
Load impedance	greater than 10 k ohms, unbalanced
Nominal output level	-10 dB (0.3 V)
Signal-to-noise ratio, overall	
One input	greater than 62 dB, WTD
6 inputs	greater than 55 dB, WTD
Frequency response	30 Hz—20 kHz, ± 2 dB
Tone control	
Treble control	variable ± 12 dB
Bass control	variable ± 12 dB
Crosstalk	greater than 50 dB
Overall distortion (input to output)	0.1% T.H.D. maximum, all nominal -10 dB output

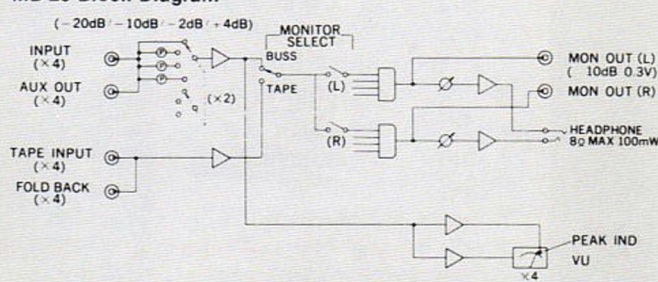
Fader attenuation	greater than 60 dB
Cue output	
Load impedance	greater than 50 k ohms
Nominal level	-20 dB (0.1 V) with nominal input
Bus input	
Input impedance	15 k ohms
Nominal level	-10 dB (0.3 V)
Accessory send/receive	
Send load impedance	greater than 10 k ohms
Nominal send level	-10 dB (0.3 V)
Receive impedance	15 k ohms
Nominal receive level	-10 dB (0.3 V)
Power req.	100/117/220/240 V AC, 50/60 Hz, 5 W
Dimensions (W x H x D)	340 x 90 x 365 mm [13 3/8" x 3 1/2" x 14 3/8"]
Weight	6 kg [13 lbs. 3 oz.] net

*Improvements may result in changes of features or specifications without notice.

Model 2A Block Diagram



MB-20 Block Diagram



M-3

Model 3

8-IN/4-OUT MIXING CONSOLE

The Tascam series Model 3 mixer offers surprising versatility for its size and economy. It actually incorporates three independent mixers—8×4 main mixer, 8×2 submixer and 4×2 monitor mixer—that are patchable in a virtually unlimited variety of configurations. A full complement of rear-panel patch points let you set up your system in minutes to suit your specific recording or mixdown requirements. This type of flexibility is your assurance that the Model 3 is a mixer that will stay with you no matter how much your studio expands. The main 8×4 mixing section is ideal for recording and remixing 4 or 8 track tapes. Input channels 4 through 8 offer phono inputs, so two turntables can be hooked up for reference when recording or mixing, or for dual disc sources for radio production. The 4×2 monitor

Input Section

The Model 3's full complement of creative features puts you in total control of the recording process. A switchable 0/20/40 dB microphone attenuator at the input of each channel lets you use low or high output microphones without danger of overloading the input stage—a common cause of distortion. And the equalizer section provides up to 15-dB peak/dip type boost or cut at four frequencies so you can efficiently compensate for room deficiencies or simply alter the sound for a desired effect. Signals from each input channel are assigned to any or all of the four output busses with a "click-free" switching matrix. The channel assignment switching matrix also features a "D" or Direct Out button which sends that channel's post-EQ/fader signal to its respective direct output jack on the rear panel.

The direct out switch is useful when you want to record more than four tracks at once, or for deck-to-deck transfers that require equalization and level control. When more than one of the channel assignments switches is engaged, the pan pot for that channel is automatically activated.

The pan pot controls the position of the sound "image" between the assigned busses.

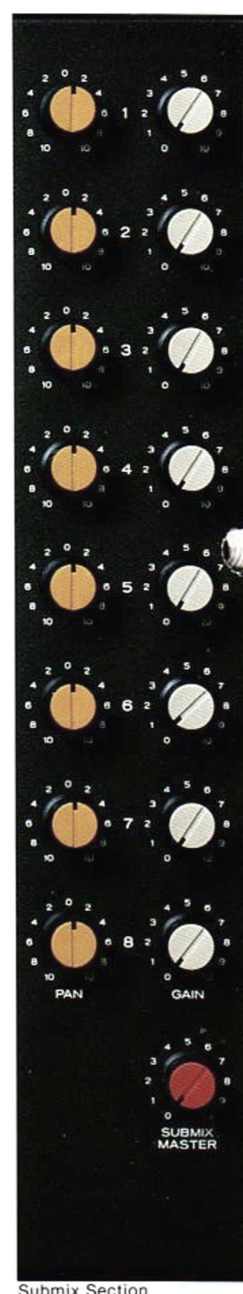
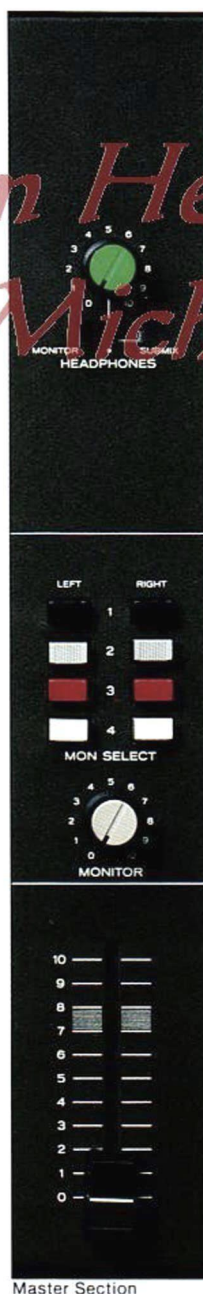
Master Section

The Model 3 master section incorporates the 4×2 monitor mixer. Four color-coded buttons are provided for the left, and four for the right monitor channels. This switching matrix enables you to select any of the output busses and assign them to the left, right or center (both left and right buttons engaged) of the stereo monitor output. The monitor section also has a master level control for independent monitor gain adjustment.

The level sent to the front and rear panel headphone jacks is adjusted by a headphone level control. A three-position switch is also provided to select headphone monitoring from the 4×2 monitor mixer section or the 8×2 submix section. Center position of this switch turns both the front and rear panel headphones off. All input channels and the master section feature smooth, noise-free straight-line faders for accurate level control.

The Submixer

The Model 3 submixer is like having a completely independent auxiliary mixer built in. Its inputs and outputs are all brought out to patch points on the unit's rear panel so it can be hooked up to perform just about any function. Each of the 8 inputs has a separate rotary level control, and a



section allows you to hear a rough stereo mix during recording or overdubbing without affecting the output to the recorder. Finally, the submixer is a completely independent 8×2 stereo mixer that can be patched in for just about any application. A stereo headphone cue mix, echo and effects send are just a few of the possibilities. The Model 3 represents excellent value in a compact mixer.



pan control that assigns the post-gain (level control) signal to anywhere in the output stereo sound field.

One useful configuration using the submixer is to connect each input channel's cue out jack to the corresponding submixer input channels. This gives you an independent cue headphone mix so the performers can monitor a different balance than that actually being recorded on the tape.

This same patch could be used to provide to additional main mix busses, giving you a total of six mixing positions from the console. Another possibility would be to feed an 8-track recorder's outputs to the submixer inputs for stereo monitoring while recording. Virtually any recording situation you can come up with, the Model 3 can handle.

• Block diagram on page 19.

Model 3 Specifications

Input selector Chan 1-4...MIC (LOW Z)/OFF/LINE
Chan 5-6...MIC (LOW Z)/PHONO/LINE
Chan 7-8...MIC (HIGH Z)/PHONO/LINE

Mic input

Mic impedance Hi-Z: 10 k ohms
Lo-Z: 200 ohms
Input impedance Hi-Z: greater than 100 k ohms
Lo-Z: greater than 1 k ohms
Nominal input level -50 dB (3 mV)
Minimum input level -66 dB (0.5 mV)
Maximum input level +10 dB (3 V) w/40 dB attenuator

Phono input

Input impedance Greater than 47 k ohms
Nominal input level -54 dB (at 1 kHz)
Minimum input level -60 dB (at 1 kHz)

Line input

Line impedance Greater than 20 k ohms
Nominal input level -10 dB (0.3 V)
Minimum input level -16 dB
Maximum input level +24 dB (15 V)

Line output/Aux. output

Load impedance Greater than 10 k ohms
Nominal output level -10 dB (0.3 V)
Maximum output level +14 dB (5 V)

Headphones

Load impedance 8 ohms
Maximum output level 1 W (rear panel), 100 mW (front panel)

Frequency response 30 Hz—20 kHz, ± 2 dB

Signal to noise ratio, overall

(measured at nominal input levels)
1 mic inputs Hi-Z: greater than 65 dB WTD,
60 dB UNWTD
Lo-Z: greater than 75 dB WTD,
70 dB UNWTD
8 mic inputs Greater than 60 dB WTD,
55 dB UNWTD
One line input Greater than 75 dB WTD,
70 dB UNWTD
8 line inputs Greater than 73 dB WTD,
68 dB UNWTD
One phono input Greater than 65 dB WTD,
55 dB UNWTD

Equalization

Peak and dip type,
 ± 15 dB continuously variable.
Hi-band—3 kHz—10 kHz, switchable
Lo-band—75 Hz—200 Hz, switchable

Crosstalk

Greater than 60 dB (at 1 kHz)

Overall distortion

0.3% THD maximum @ -10 dB output, (30 Hz—20,000 Hz)

Send and receive data

Accessory send level Nominal—10 dB (0.3 V) into 10 k ohms or higher

Accessory receive level Nominal—10 dB (0.3 V) into 10 k ohms or higher

Buss input, sub-mix buss input

Input impedance Greater than 10 k ohms
Nominal level -2 dB (0.775 V)

Monitor input

Input impedance Greater than 10 k ohms
Nominal level -2 dB (0.775 V)

Sub-mix input

Input Impedance Greater than 10 k ohms
Nominal level -10 dB (0.3 V)

Cue & Direct output

Load impedance Greater than 10 k ohms
Nominal level -10 dB (0.3 V)

Power req.

100/117/220/240 V AC, 50/60 Hz 18 W

Dimensions

465 x 160 x 520 mm

(W x H x D)

[18 1/4" x 6 1/4" x 20 1/2"]

Weight

14 kg [30 lbs.] net

*Improvements may result in changes of features or specifications without notice.



M-5B

Model 5B

8-IN/4-OUT MIXING CONSOLE

For a medium-size 4 or 8 track recording studio, the Tascam series Model 5B 8-in/4-out mixing console offers the highest performance in terms of sound quality, flexibility and economy. It offers versatility and many features usually found only on much larger consoles. Numerous accessory patch points and a comprehensive system of multiple input and output jacks let you reconfigure the setup in minutes to suit specific recording or remix situations.

Overall, the Model 5B is the most flexible mixer in its class. The main panel layout is human engineered for greatest ease of operation, and the functions available are more than sufficient to produce commercial-quality master tapes. The Model 5B also features fully modular construction so you can swap modules if one is malfunctioning and needs to be serviced.

The Model 5B is the perfect mixer for your first studio, and is versatile enough to handle all your requirements as your system grows. On its own, it provides plenty of mixing power for even



Input Module

Each input channel on the Model 5B (and Model 5BEX) features a Mic/Line input selector, 0/20 dB switchable mike attenuation and a 0—20 dB trimmer for any input source. Input modules 1 through 4 have an additional Tape position on the input selector so you can remix a tape with equalization—without having to repatch the tape output connections. Independent pre-fader/EQ cue controls let you set up a headphone mix for the performers when recording and overdubbing, and post-fader/EQ echo send controls make it simple to selectively add precisely controlled amounts of echo or other effects to specified tracks.

For extensive control over the sound you record, a four-frequency/two-control equalizer can be peaked or dipped by 15 dB at 75 Hz or 200 Hz with the low control, and at 3 kHz or 10 kHz with the high control. The signal from each input channel can be sent to any of four output busses with a "click-free" channel assignment matrix, and a pan control is automatically engaged whenever more than one output buss is assigned. Pressing any of the Solo buttons lets you hear that channel alone for fine adjustment of EQ, trouble-shooting, etc., and the "D" or Direct button routes



the channel's post-fader/EQ output to a rear-panel direct out jack for deck-to-deck transfers that require EQ and level control, or for recording more than four tracks at one time.

Submaster Module

The four submaster modules feature independent tape cue level controls that feed the correspondingly numbered channels from the recorder to the cue buss so the performers can monitor the previously recorded tracks for overdubbing operations. Monitor gain and pan controls are also provided on each submaster module so you can set up a rough stereo monitor mix to be fed to the control room monitor speakers (or headphones)—without affecting the actual program being recorded. The amount of echo signal added to each of the four output busses can be precisely controlled by independent echo receive controls, and a monitor/program selector lets you route the echo signal to either the monitor or program busses. By sending the echo signal to the monitor busses and recording the original tracks "dry" (without echo), you can hear how the finished recording will sound after echo has been added to the actual program during mixdown.



Master Module

On the master module, controls are provided to assign and adjust the level of the signal sent to the front-panel headphone jack. Headphone monitoring can be selected from either the control room or studio monitor feed circuits. A master control is also provided to adjust the overall level of the monitor busses. The studio monitor and control room monitor feeds can be independently switched to derive the monitor signal from three different sources: the main mixing busses, cue buss or auxiliary buss. This lets the recording engineer selectively monitor all three sources while the performers hear only the cue mix, or any other combination. A master solo level control is additionally provided to adjust the volume of any input channel when that channel's solo button is pressed. A 400 Hz test tone oscillator built into the master module facilitates calibrating and checking out your system. All input, submaster and master modules have smooth conductive-plastic faders for precise, noise-free level control.

Talkback Module (Optional)

Optionally available for the Model 5B, the talkback module incorporates a built-in

fairly sophisticated setups. If you should ever need more inputs, however, the Model 5BEX 8-input expander console can be added to provide a full 16x4 buss system. And you can add another 4 inputs to the Model 5BEX for a 20x4 system.

Whether you're making demos in your living room or garage, recording or reinforcing live dates on location, or working in a studio, the reliable, clean-sounding Model 5B and its companion expander form a mixer you'll really appreciate.



microphone which can be selectively assigned to the studio monitor feed, cue buss or program buss for convenient communication with the performers or slating the recorded program with voice cues. A 50 or 60 Hz slate tone is also provided which, when recorded on the tape, reproduces as a high-pitched "beep" during fast wind for easy location.

• Block diagram on page 19

Model 5B Specifications

Input/Output Channels

8 Inputs, 4 outputs; expandable to from 16 to 20 inputs (total) with Model 5BEX

Input Selector

Channels 1-4
Channels 5-7
Channel 8

Mic Input

Source impedance

Mic/Line/Tape
Mic/Off/Line
Mic/Test/Line
200 ohms nominal mics (matched for mics of 600 ohms or less)

Nominal input level -50 dB (3 mV)
Maximum input level +25 dB (18 V)

Line Input

Input impedance Greater than 50 k ohms
Nominal input level -10 dB (0.3 V)
Maximum input level +30 dB (30 V)

Auxiliary Input, Buss & Tape Inputs, Echo & Accessory Receive Inputs

Input impedance Greater than 10 k ohms
Nominal input level -10 dB (0.3 V)
Maximum input level +18 dB (8 V)

Solo & Echo Inputs (for 5BEX Expander)

Input impedance Greater than 10 k ohms
Nominal input level -10 dB (0.3 V)
Maximum input level +18 dB (8 V)

Cue Input (For 5BEX Expander)

Input Impedance Greater than 40 k ohms
Nominal input level -2 dB (0.78 V)
Maximum input level +18 dB (8 V)

Line Output/Aux Output

Load impedance Greater than 10 k ohms
Nominal output level -2.2 dB (0.775 V), switchable to -10 dB (0.3 V)

Maximum output level +18 dB (8 V)

4-Channel, Control Room & Studio

Monitor Outputs, Cue Output

Load impedance Greater than 10 k ohms
Nominal output level -2.2 dB (0.775 V)
Maximum output level +18 dB (8 V)

Echo Send Output, Accessory Send

Output, & Direct

Outputs

Load impedance Greater than 10 k ohms
Nominal output level -10 dB (0.3 V)
Maximum output level +18 dB (8 V)

Talkback Output

Load impedance For 8 ohms or higher speaker
Maximum output 1 W

Headphone Output

Load impedance For 8 ohms or higher stereo headphones

Maximum output level 1 W (rear panel, studio), 100 mW (front panel)

Frequency Response

30 Hz—20,000 Hz, ± 2 dB

Equivalent Input Noise

-125 dB, weighted, (30 Hz—20,000 Hz)

Overall Distortion

Mic in to line out/line in to line out
0.1% THD maximum @ -10 dB output, (30 Hz—20,000 Hz)

Signal-to-Noise Ratio, Overall

(weighted, subtract 5 dB to obtain unweighted value)
1 channel > 75 dB
8 channels > 65 dB

Equalization

Maximum boost or cut 15 dB (peak/dip curves)
Low frequency 75 Hz or 200 Hz, switchable
High frequency 3 kHz or 10 kHz, switchable

Crosstalk (isolation)

Adjacent busses or inputs
Greater than 60 dB @ 1,000 Hz

Meter & LED Calibration

Calibration may be individually adjusted for each meter and each LED

Power Mains Requirements

100/117/220/240 V AC, 50/60 Hz, 40 W

Dimensions

(W x H x D)
600 x 185 x 620 mm
[23 1/4" x 7 1/2" x 24 1/2"]

(Model 5B or 5BEX)

Weight

Model 5B 28.2 kg [62 lbs.] net

Model 5BEX 28.2 kg [62 lbs.] net with 12 inputs

*Improvements may result in changes of features or specifications without notice.



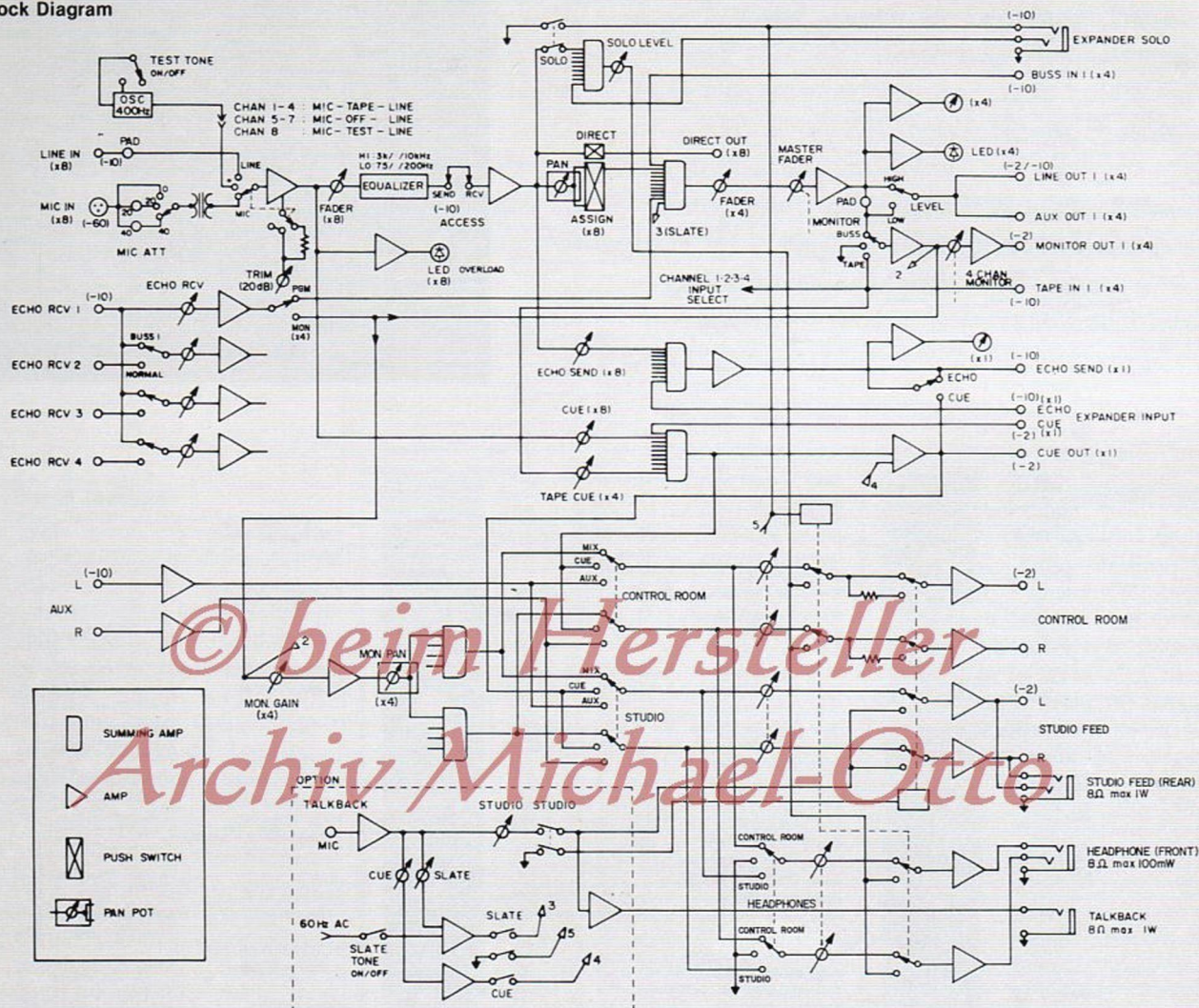
Talkback Module



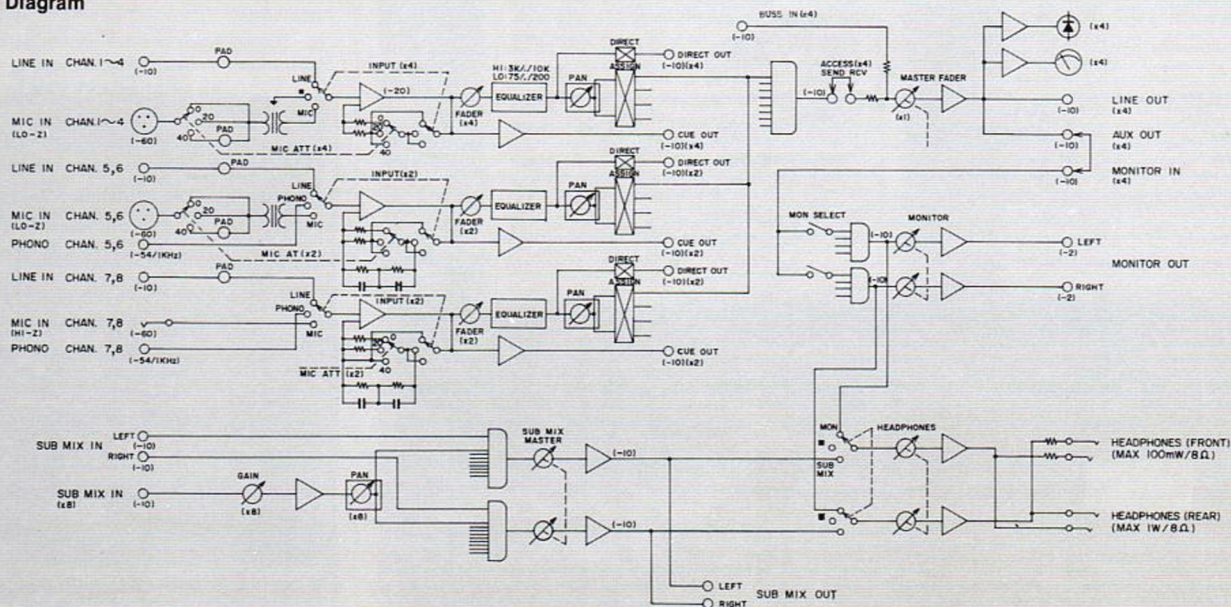
M-5BEX

M-3 & M-5B BLOCK DIAGRAM

Model 5B Block Diagram



Model 3 Block Diagram



M-1 Model 1

8-IN/2-OUT LINE MIXER



This economical, high quality 8 x 2 line mixer is perfect for any situation where you require auxiliary line mixing capability. One or more Model 1's can be added to your system to provide extra headphone cue mixes, echo mixes, monitor mixes, or any other type of mix you might need with your Model 2A, Model 3 or Model 5B. The Model 1 is the ideal building block for your growing multitrack recording system.

The Front Panel

The Model 1 front panel features independent gain and pan controls for each of the eight input channels. The eight rotary gain controls set the level of the correspondingly numbered input. The pan pots then send the signal to the left or right busses, or anywhere in between. Like all Tascam Series mixers, the pan circuit is designed to lower the signal level on each buss when the pan pot is centered, so the relative output level is constant as the pan pot is rotated. Since the Model 1 has only two output busses, the pan pot is always engaged.

A two-gang rotary master fader is also provided. This control adjusts the level of the stereo mixing buss feeding the line and auxiliary outputs. Another practical feature of the Model 1 is that even when its power is switched off, signals at the input jacks still appear at the cue out (fold-back) jacks, so the main signal paths are not interrupted when the unit is not in use.

In addition to the line and auxiliary outputs, the Model 1 also has a stereo headphone jack and independent level control. The headphone level is not affected by the master fader.

The Rear Panel

Eight line inputs are provided on the Model 1 rear panel which accept line level signals from high or low impedance sources. The signals applied to each input appear unaltered at the correspondingly numbered cue output jacks.

The stereo line and auxiliary output jacks are connected in parallel so they both carry the mixer's two-buss output, at the level set by the master fader. Generally, the line outputs are used as the mixer's main stereo output, while the auxiliary outputs can be connected to a second Model 1 for a 16 x 2 mix, to a monitor amplifier, or to virtually any other load.

Left and right inputs are also provided so you can add a stereo signal to the main mixing buss. These buss inputs are controlled by the master fader, and are handy for cascading two Model 1s.

The rear panel also features a supplementary headphone jack (1 W into 8 ohms) that can be used to feed remote headphones for the performers.

Model 1 Specifications

Line Input (X8)

Input impedance Greater than 30 k ohms
Nominal input level -10 dB (0.3 V)
Maximum input level +30 dB

Buss Input (X2)

Input impedance Greater than 30 k ohms
Nominal input level -10 dB (0.3 V)
Maximum input level +20 dB

Line Out/Aux Out (X2)

Load Impedance Greater than 10 k ohms
Nominal output level -10 dB (0.3 V)
Maximum output level +17 dB

Cue Out (X8)

Nominal level -10 dB (0.3 V); Level and impedance depend on the source connected to the Line input.

Headphones (X2)

Load Impedance 8 ohms
Maximum output level Front: 100 mW; Rear: 1 W

S/N Ratio, Overall Greater than 78 dB WTD.

Frequency Response 30 Hz-20 kHz, ± 1 dB

Crosstalk Greater than 50 dB (at 1 kHz)

Distortion 0.1% at 1,000 Hz

Power req. 100/117/220/240 V AC, 50/60 Hz, 8 W

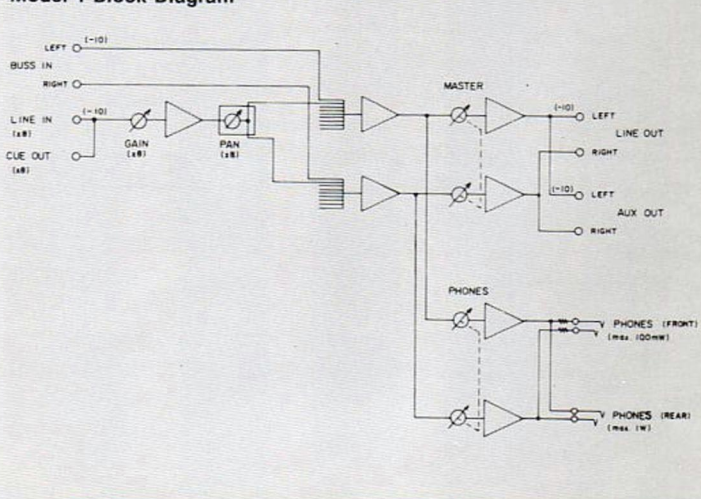
Dimensions 435 x 111 x 102 mm

(W x H x D) [17 1/8" x 4 3/8" x 4"]

Weight 2.9 kg [6 lbs. 8 oz.] net

**Improvements may result in changes of features or specifications without notice.*

Model 1 Block Diagram



M-15

Model 15

16 or 24-IN/8-OUT MIXING CONSOLE

The Model 15 is a full professional grade mixing console that offers extensive flexibility through comprehensive signal routing and patch systems. The Model 15 functions can be easily set up and changed to suit the specific needs of your multitrack studio. And since RCA connectors are used for all line level patch points, you save literally thousands of dollars that would normally be absorbed by expensive canon type connectors and three-wire cable. This system delivers outstanding noise performance because our engineers took special care in laying out the grounding. And the heavily decoupled power supply is an independent

Laying Down the Tracks

For most multitrack recordings, especially when using a 16 track recorder, not all of the tracks are recorded at once. The Model 15's 8 program mixing busses are therefore usually more than sufficient to do the job. If the necessity to record more than 8 tracks at once does arise, however, there's still two auxiliary mixing busses, and all the input modules have direct outputs. In any situation the Model 15 will prove to have plenty of mixing power.

Flexible Monitoring

The Model 15 offers an extremely wide range of monitoring possibilities. For example, you can set up a 16 x 2 stereo monitor mix, or an 8 x 4 monitor mix without affecting the material being recorded. Single or multiple channels can be "soloed" facilitating channel identification, equalization and troubleshooting. And playback from one to three 2 track decks, or a 2 track and a 4 track, can be selected right from the console. You can listen to the echo signal only, or the performer's headphone cue. Echo can be added to the monitor only, the program only, or both. You can even set up separate cue mixes for two performers. On the whole, you get tremendous monitoring flexibility that was previously only available in extremely expensive custom consoles. The Model 15 also has a comprehensive visual monitoring system.

Each input channel has a LED peak indicator that helps you keep overload distortion to a minimum. Also, the 8 program busses and 2 auxiliary busses have illuminated, accurately calibrated VU-meters that incorporate LED peak indicators so you can see even the briefest transient peaks.

The Final Mix

Once you've recorded all the tracks, the multitrack recorder outputs must be reconnected from the monitor buss to the main program buss for final mixdown. Unlike many systems, the Model 15 lets you perform this operation with a quick sweep of the finger across the bat-handle Mic/Line/Remix selectors—no more repatching and fumbling with cables. The recorded tracks can then be mixed, panned and re-equalized in any way you like. Any track can be conveniently "muted" when you want to eliminate it from the program, or "soloed" when you want to make fine adjustments in its sound.

Echo and Effects

The Model 15's two auxiliary mixing busses make handling echo and effects send/receive fast and convenient. Both Auxiliary Send pots on each input module can send the channel's signal either pre or post fader/EQ affording surprising flexibility. The Aux systems can be quickly converted for specific requirements: two cue systems, one cue and one

echo, stereo echo for remix—all without repatching. The monitor system can even be used to provide additional echo sends during remix. Each buss master module has its own echo receive circuits, and these can be augmented with the monitor mixing system. Each echo receive can be assigned to any of four systems: buss, monitor A, monitor B, or aux A. The possible configurations are virtually unlimited.

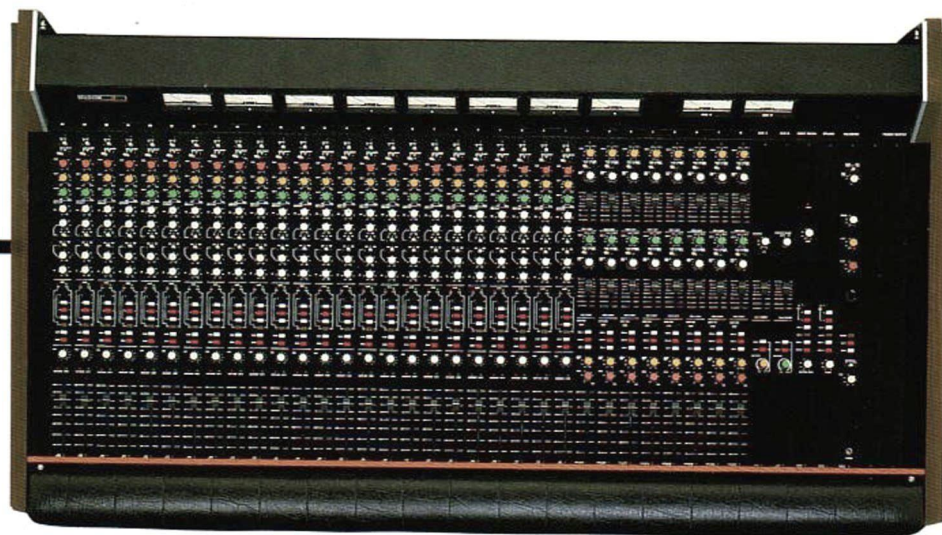
Power Supply

The Model 15 utilizes an independent power supply which can be mounted remotely, keeping heat and hum fields away from the audio circuitry. The remote supply contains the main AC power switch, fuses, and sockets for the power cables. The AC line cord and supply-to-console cable are included. A power module in the console accepts the output of the supply. If you want to use phantom powered condenser microphones, you simply install precision resistors on each input module corresponding to the



Power Supply

remote unit, so hum and heat cannot affect audio performance. Mic input quality has been greatly improved by using discrete FET mic preamps—lower noise and distortion, greater channel-to-channel consistency.



- ① Input Module
- ② Buss Master Module
- ③ Aux A Master Module
- ④ Aux B Master Module
- ⑤ Control Room Monitor Module
- ⑥ Studio Monitor Module
- ⑦ Talkback/Oscillator/Headphone Module

specific mic voltage you need (48 volts, AB or 9 volts), and hook up your source of DC voltage to the Model 15 power supply.

Accessory Features

Tone and voice slating facilities are provided so you can easily identify tapes and takes. The 40 Hz signal from the built in test oscillator makes it easy to find a cue during fast wind, and 5 other selectable oscillator frequencies are handy for testing, level calibration or recorder alignment. The talkback mike lets you communicate with performers in the studio via the monitor system. The Model 15 comes completely wired and ready for setup. Your 16 track system can easily be assembled and put into operation on the same day.

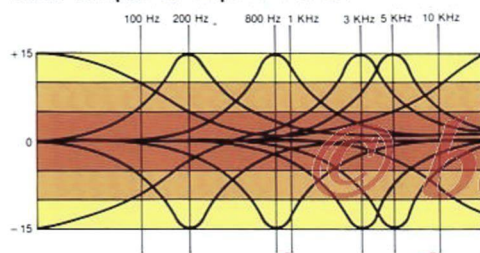
The Model 15: A Sensible Investment

The Model 15 gives you total control of your mixes with remarkable speed of operation. It's also reliable; it runs, and keeps on running, without expensive maintenance. In the rare event of a problem, you can get back to normal fast, particularly if you purchase a few spare modules. Your clients will appreciate the sound and the service, and happy clients lead to faster payback on your investment. Also, since the Model 15 will adapt to your growing needs, it is one investment you can continue to enjoy long after it's paid for itself.



M-15 (continued)

Model 15 equalizer response curves



Model 15 Specifications

Input/Output Channels	16 (or 24) Inputs, 8 Outputs
Input Selector	
Channels 1-16	Mic/Line/Tape
Channels 17-24	Mic/Line/Off (24 channel version)
Mic Input	Balanced XLR 3-Pin
Source impedance	200 ohms nominal mics (matched for mics of 600 ohms or less)
Nominal input level	-50 dB (3 mV)
Maximum input level	+20 dB (10 V)
Line Input	
Input impedance	Greater than 50 k ohms

Nominal input level	-10 dB (0.3 V)
Maximum input level	+28 dB (25 V)
Echo Receiver, Buss Input	
Input impedance	Greater than 20 k ohms
Nominal input level	-10 dB (0.3 V)
Maximum input level	+18 dB (8 V)
Input Accessory Receive	
Input impedance	Greater than 50 k ohms
Nominal input level	-10 dB (0.3 V)
Maximum input level	+18 dB (8 V)
Buss Master Accessory Receive	
Input impedance	Greater than 10 k ohms
Nominal input level	-10 dB (0.3 V)
Maximum input level	+30 dB (31 V)
Tape Input	
Input impedance	Greater than 40 k ohms
Nominal input level	-10 dB (0.3 V)
Maximum input level	+18 dB (8 V)
Line 1, 2 & 3 Monitor Inputs	
Input impedance	Greater than 100 k ohms
Nominal input level	-10 dB (0.3 V)
Maximum input level	+18 dB (8 V)
Tape Foldback	
Load impedance	Equal to the load impedance of the device connected
Line Output/Aux Output	
Load impedance	Greater than 10 k ohms
Nominal output level	-2.2 dB (0.775 V), switchable to -10 dB (0.3 V)
Maximum output level	+18 dB (8 V)

Aux A & B Outputs, C.R. Monitor Output	
Load impedance	Greater than 10 k ohms
Nominal output level	-2.2 dB (0.775 V)
Maximum output level	+18 dB (8 V)
Monitor A & B Outputs, Aux 3 & 4	
Load impedance	Greater than 10 k ohms
Nominal output level	-10 dB (0.3 V)
Maximum output level	+18 dB (8 V)
Send Output	
Load impedance	Greater than 10 k ohms
Nominal output level	-10 dB (0.3 V)
Maximum output level	+18 dB (8 V)
Talkback Output	
Load impedance	For 8 ohms or higher speaker.
Maximum output level	Maximum output 1 W
Headphone Output	
Load impedance	For 8 ohms or higher stereo headphones. Maximum output 100 mW
Frequency Response	
Program, Aux & Monitor buss	20 Hz—20,000 Hz, ± 1 dB
Headphone	50 Hz—15,000 Hz, ± 2 dB
Equivalent Input Noise	
Noise	-126 dB, weighted; -123 dB unweighted; (20 Hz—20,000 Hz)
Overall Distortion	
Mic in to line out/Line in to line out	0.03% THD at 1,000 Hz
Overall Signal-to-Noise Ratio	
	(Weighted, subtract 3 dB for unweighted value)

	1 channel	16 channels	24 channels
mic input	> 76 dB	> 65 dB	> 63 dB
line input	> 76 dB	> 72 dB	> 70 dB

Equalization	
Maximum boost or cut	15 dB
Low frequency	75 Hz, shelving type
Low-mid frequency	200 Hz or 800 Hz, peak/dip type
High-mid frequency	3,000 Hz or 5,000 Hz, peak/dip type
High frequency	10,000 Hz, shelving type

Crosstalk	
Adjacent busses or line outputs	65 dB @ 1,000 Hz
Input switch	65 dB @ 1,000 Hz
Fader Attenuation	Greater than 75 dB @ 1,000 Hz

Meter & LED Calibration	Calibration may be individually adjusted for each meter and each LED
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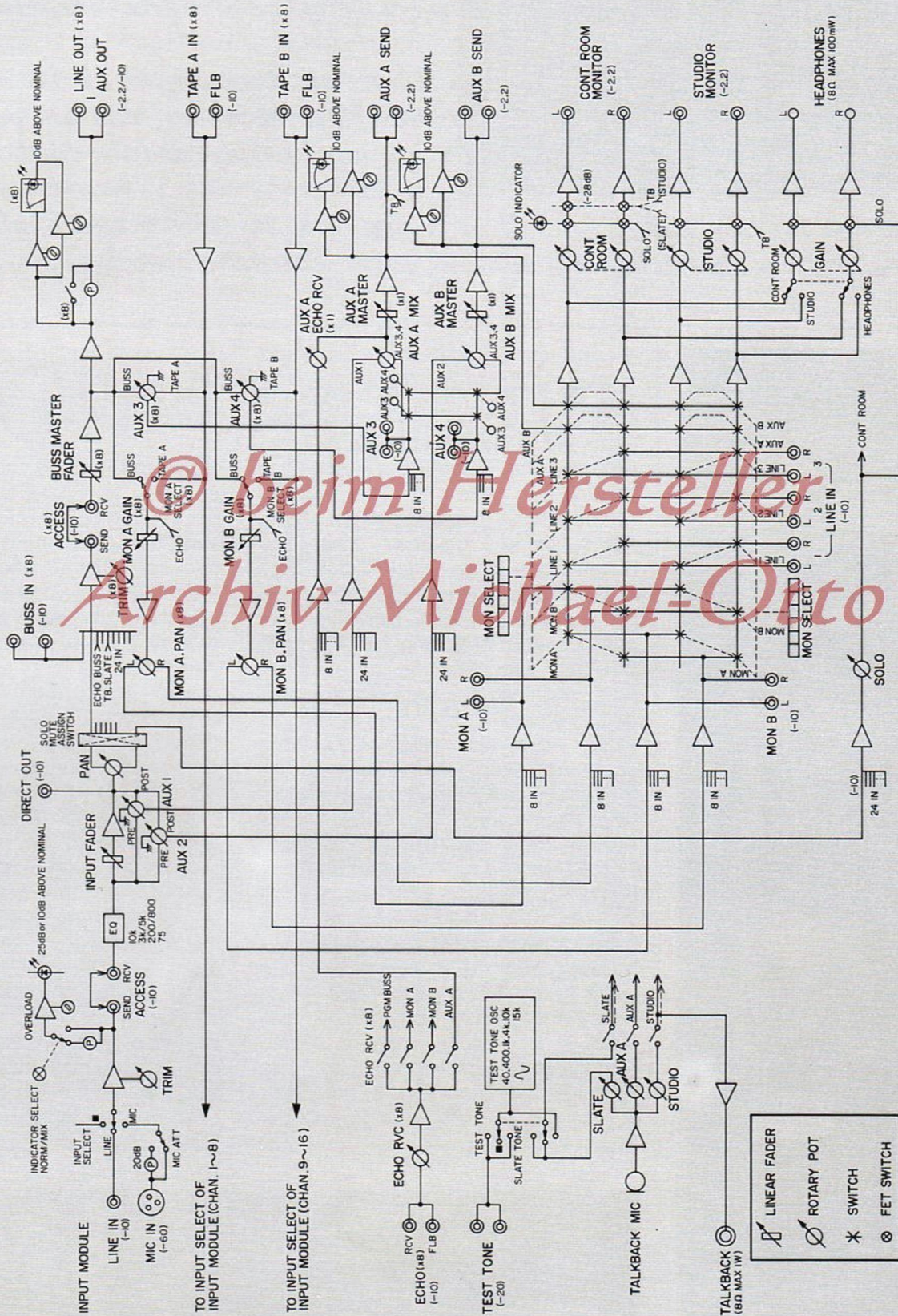
Power Mains Requirements	100/117/220/240 V AC, 50/60 Hz, 60 W
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Dimensions (W x H x D)	
24 channel mainframe	1,562 x 318 x 813 mm [61 1/2" x 12 1/2" x 32"]
Power supply	480 x 185 x 255 mm [16 1/2" x 7 1/4" x 10"]

*Improvements may result in changes of features or specifications without notice.



Model 15 Block Diagram



SCHEMATIC
Model 15 Audio Mixing Console
REV. _____

M-144

Model 144 **PORTASTUDIO** INTEGRATED 4-IN/2-OUT MIXER AND 4-CHANNEL MULT

A totally new concept in multitrack recording systems, the Model 144 Portastudio is a full-function mixer with a 4-channel multitrack cassette recorder built-in. In one unique package you have virtually everything you need for every stage of the multitrack recording process: recording, overdubbing, remix and mixdown.

TEAC engineers developed a special 4-channel Simul-Sync head for the Model 144 that provides full frequency response in both the record and playback modes. You can perform direct "ping-ponging" operations with minimal effect on sound quality, and the Model 144 even lets you use professional "punch in" recording techniques.

The mixer section is exceptionally versatile for a unit of its compact size, and offers a number of features usually only found on much larger, expensive consoles.

25



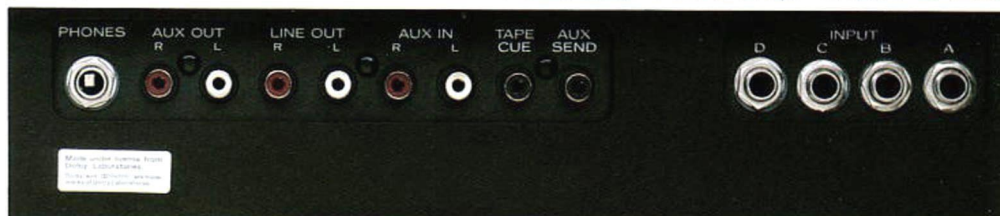
The Mixer Section

The Model 144 mixer is basically a 4 x 2 configuration with the four input channels feeding left and right output busses that can be switched to record on two of the built-in recorder's four tracks at one time. For remix and mixdown operations (when none of the record selectors are engaged), the recorder's four output channels are fed to the mixer's input channels providing full mixdown flexibility with facilities for equalization, panning, and adding echo or other effects. Each channel has an AUX send control that can be used to set up a mono mix of the input signals for processing by an external effects or echo unit. An AUX receive control adjusts the amount of effects or echo signal returned to the stereo program buss. Tape cue controls for each of the recorder's output channels are handy for setting up a rough cue mix for monitoring the recorded tracks while overdubbing, and these same controls can be used as a second echo or effects send during stereo mixdown. All connections including mic/line input jacks, AUX send, AUX in, cue out, phones, line and AUX out are easily accessible on the rear panel.

The Recorder Section

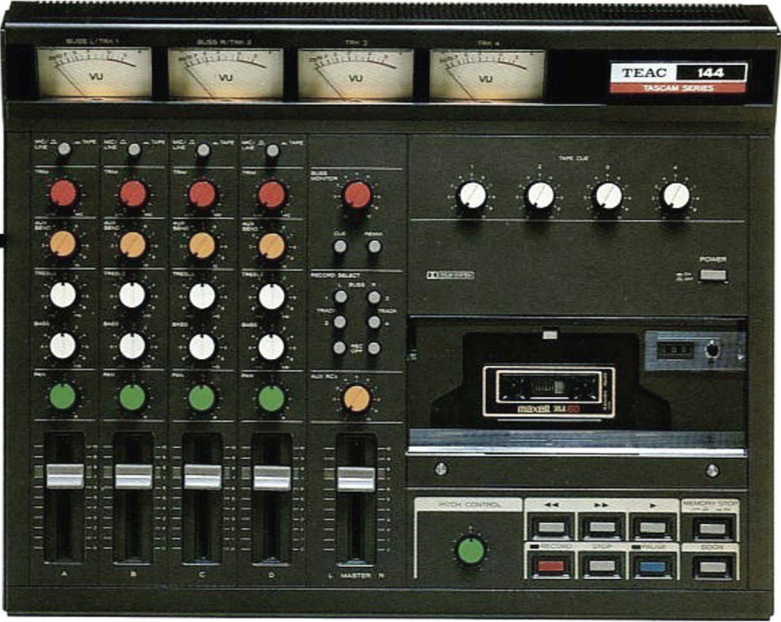
The Model 144's built-in 4-channel multitrack recorder is the first of its kind. And it is based on our extensive experience in the multitrack recording field. It provides sound quality and performance rivalling the best separate component decks, and is packed with advanced TEAC tape technology for maximum reliability and durability under all conditions. In order to maintain reproduction quality standards as high as possible, the Model 144 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-quality Cobalt or CrO₂ tapes. A built-in 4-channel Dolby* noise reduction system also keeps performance high by reducing tape hiss and noise to surprisingly low levels. Your recordings always sound crisp and clear—even after several "ping pong" track transfers.

The 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



ITRACK CASSETTE RECORDER

The Model 144 Portastudio's unusually compact integrated design and light weight make it perfect for recording on location. You can virtually carry an entire studio under your arm. Just take along a few mikes and a pair of headphones and you can set up your studio in minutes—anywhere. This is also a tremendous advantage where studio space is limited, and an array of bulky machinery would result in a cramped, uncomfortable atmosphere.



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.

In Short

The Model 144 Portastudio is a breakthrough in creative multitrack record-

ing. It brings top-quality creative recording capabilities within reach of the home studio enthusiast and serious musician/engineer—with unprecedented economy and portability.

Model 144 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 cobalt or CrO₂ tape that requires high-bias level (chrome position) and 70-microsecond EQ (TDK-SA MAXELL UDXL-II, or equivalent)
4-track, one direction (Special format)

Record Tracks

2 with full-time Dolby[®] encoding (switchable to the 4 record tracks)

Playback Channels

4 with full-time Dolby[®] decoding

Normal Tape Speed

3 $\frac{3}{4}$ 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)
1 FG servo-controlled DC capstan motor and 1 DC reel motor
 $\pm 0.06\%$ peak, weighted: 0.04% RMS, weighted (measured with flutter test tape)

Wow & Flutter

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 $\frac{1}{8}$ " x 4 $\frac{3}{4}$ " x 14 $\frac{3}{8}$ "]

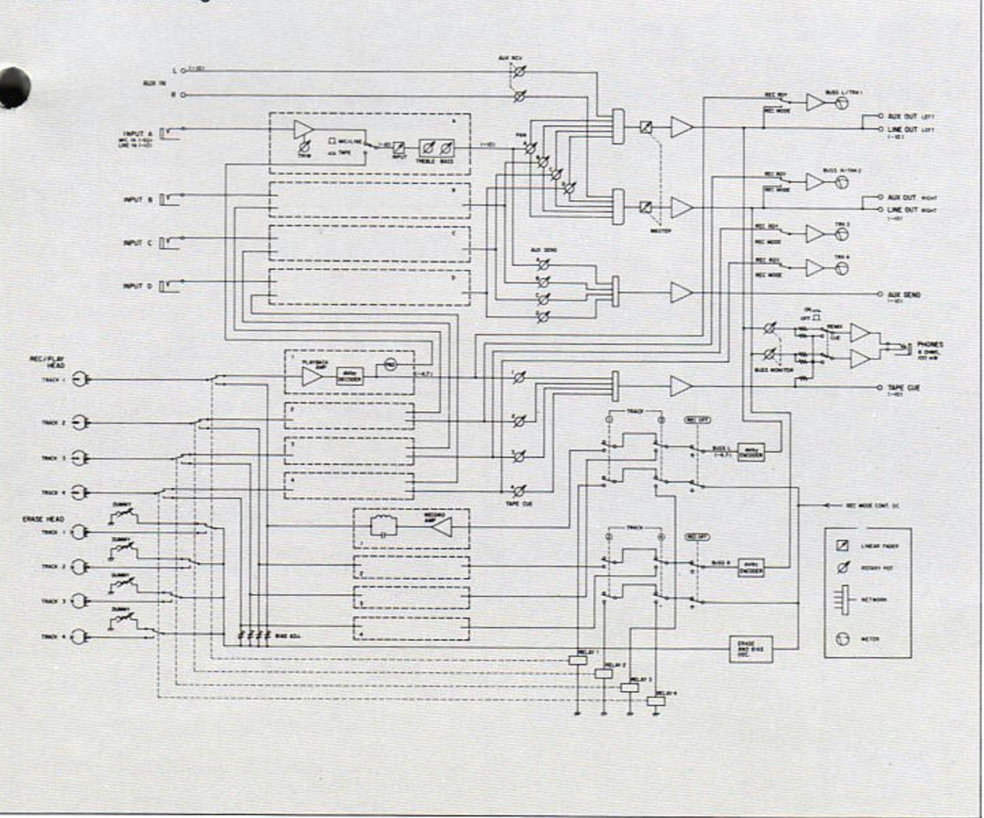
Weight

9 kg [20 lbs.] net

*Improvements may result in changes of features or specifications without notice.

**"Dolby" is a trademark of Dolby Laboratories.

Model 144 Block Diagram



THE STEREO MASTER RECORDER

Once the multitrack master tape has been recorded, it must be mixed down to its final stereo format. This requires a second tape deck onto which the stereo program is recorded. Naturally, just any old deck will not do since this stereo master will be used to produce copies, and perhaps even cut a record. The stereo master recorder must provide exceptional reproduction performance so that deterioration in sound quality during the multitrack master to stereo master transfer is kept to an absolute minimum. Reliability and durability are also important features. For this



reason, the tape format of a stereo master recorder is usually 2-track 2-channel: i.e. only two tracks are recorded on the full width of the tape to utilize the maximum possible tape area per track. Maximum tape speed is also usually fairly high (15 ips) to further ensure maximum possible reproduction fidelity. Tascam stereo master recorders offer all these qualities and more: easy-operation cue and editing facilities, dbx[®] noise reduction systems, and adjustable bias and equalization for optimum performance with the tape of your choice.

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Archiv Michael-Otto

32-2

2-TRACK STEREO MASTER RECORDER



The latest addition to our top-performance stereo master recorder line, the 32-2 offers top-level mastering performance with remarkable economy. Its transport is exceptionally stable thanks to an advanced dual-capstan closed-loop system that maintains perfect tape-to-head contact at all times, virtually eliminating distortion due to tape flutter. With an optional dbx noise reduction unit (DX-2A), the 32-2 provides outstanding signal-to-noise ratio and stunning dynamic range. All transport functions are activated via fast-acting electronic switches, and an advanced motion sensing system assures smooth changeover between all transport modes.

Other Features

- * Manual cue lever for easy editing
- * Rec Mute function to cancel unwanted material while recording
- * Switchable 15 ips and 7-1/2 ips tape speeds
- * Pitch control ($\pm 6\%$) for accurate record and playback tape speed tuning (approx. 1/2-tone)
- * Selectable IEC and NAB equalization
- * Accurate wide-range VU meters
- * Optional remote control unit (RC-90)

32-2 Specifications

Tape format	quarter-inch, 2 tracks
Reel size	10 1/2" and 7"

Tape speed	15 ips and 7 1/2 ips
Line input	60 mV Impedance: 50 k ohms, unbalanced
Line output	0.45 V Load impedance: greater than 10 k ohms, unbalanced
Equalization	NAB/IEC, switchable
Speed accuracy	$\pm 0.5\%$
Wow and flutter	0.02% RMS(NAB), weighted at 15 ips 0.04% RMS(NAB), weighted at 7 1/2 ips Measured with flutter test tape
Overall frequency response	40 Hz—20 kHz, ± 3 dB at 15 ips 40 Hz—20 kHz, ± 3 dB at 7 1/2 ips
Signal to noise	63 dB weighted (NAB equalization), referenced to 3% T.H.D. level
T.H.D. overall	0.6% at normal operating level
Crosstalk	greater than 50 dB at 1 kHz
Power req.	100/117/220/240 V AC, 50/60 Hz, 65 W
Dimensions (W x H x D)	432 x 452 x 262 mm [17" x 17 3/4" x 10 1/4"]
Weight	20 kg [44 lbs.] net

*Improvements may result in changes of features or specifications without notice.
**dbx[®] is a trademark of dbx Incorporated.

35-2

2-TRACK STEREO MASTER RECORDER



The 35-2 has been specifically designed for recording situations where professional-quality 2-track master tapes are required. It offers the rugged durability and reliability essential in a hard-working studio deck, as well as outstanding reproduction precision.

In addition to the 35-2's inherent stability and superb reproduction performance, a built-in dbx noise reduction system provides an extra measure of fidelity. By encoding and decoding your recordings with the dbx system, you get 100-dB or higher recordable dynamic range instead of the rather limited range of most production equipment. Tape hiss is literally reduced to inaudibility, and distortion can be almost completely avoided due to much higher saturation levels.

Unsurpassed transport stability and tape-to-head contact is assured by an advanced tension servo and impedance roller. And a motion sensing system eliminates tape damage during direct mode changeover.

Other Features

- * Pitch control ($\pm 6\%$) for accurate tape speed tuning (approx. 1/2-tone)
- * Selectable 15 ips and 7-1/2 ips tape speeds
- * Wide-range peak meters with integral peak indicator LEDs
- * Flip-up head cover for easy

maintenance access

- * Edit function for convenient tape "dumping"
- * Manual cue lever
- * Optional remote control unit (RC-70)
- * Fine record bias and equalization adjustment
- * Optional tape deck console (CS-600)
- * Independent transport and electronics assemblies



35-2 with CS-600

Model 35-2 Specifications

Tape format	quarter-inch, 2 tracks
Reel size	10 1/2" and 7"
Tape speed	15 ips and 7 1/2 ips
Line input	60 mV Impedance: 50 k ohms. unbalanced
Line output	0.35 V Load impedance: greater than 10 k ohms, unbalanced
Equalization	NAB standard
Speed accuracy	$\pm 0.5\%$ deviation from 15 ips
Wow and flutter	0.03% RMS(NAB), weighted at 15 ips 0.06% RMS(NAB), weighted at 7 1/2 ips Measured with flutter test tape
Overall frequency response	40 Hz—22 kHz, ± 3 dB at 15 ips 40 Hz—18 kHz, ± 3 dB at 7 1/2 ips
Signal to noise	60 dB weighted (NAB equalization), referenced to 3% T.H.D. level
T.H.D. overall	0.6% at normal operating level
Crosstalk	greater than 50 dB at 1 kHz
Power req.	100/117/220/240 V AC, 50/60 Hz, 150 W
Dimensions (W x H x D)	Transport: 478 x 419 x 268 mm [18 3/4" x 16 1/2" x 10 1/2"] Electronics: 478 x 177 x 237 mm [18 3/4" x 7" x 9 3/4"]
Weight	Transport: 25 kg [55 lbs.] net Electronics: 8 kg [17 lbs. 9 oz.] net

*Improvements may result in changes of features or specifications without notice.

**"dbx" is a trademark of dbx Incorporated.

ACCESSORIES

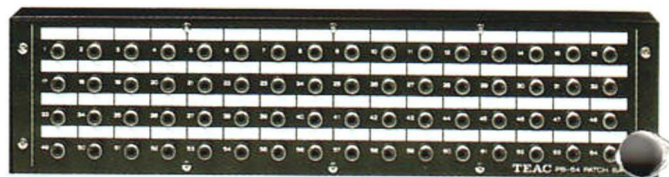
GE-20 2-Channel 10-Band Graphic Equalizer

Designed to complement Tascam series mixing consoles, the GE-20 Graphic equalizer features two independent channels with ten in-line controls providing ± 12 dB equalization at one-octave intervals. Center frequencies are 31.5 Hz, 63 Hz, 125 Hz, 250 Hz, 500 Hz, 1 kHz, 2 kHz, 4 kHz, 8 kHz, and 16 kHz. Each channel has independent switchable high and low pass filters, input level control, overload indicator, EQ defeat switch and output level control. An accurate VU meter is also provided, switchable to indicate the output level of the left or right channels.



PB-64 64-Point Patch Bay

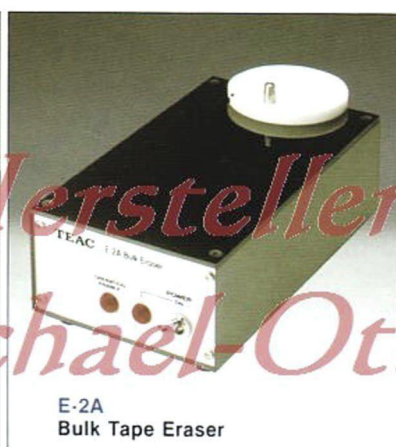
For comprehensive, convenient patching of your multitrack system, the PB-64 offers 64 RCA type connectors on the front panel directly connected to the rear panel. All system patch points can be connected to the PB-64 rear panel for convenient re-routing via front-panel jumper cables.



HP-200pro
Monitor Headphones



E-3
Tape Head Demagnetizer



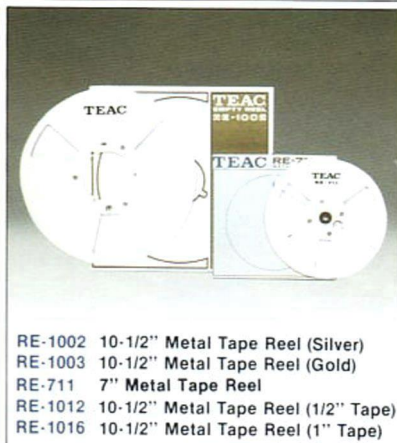
E-2A
Bulk Tape Eraser



AX-20
Stereo Mixdown Panel
4-In/2-Out. Left, right, or center on switching matrix.



TO-122A
Test Tone Oscillator
40, 400, 1 k, 4 k, 10 k & 15 kHz.
-10/-40 dB
TO-8
Test Tone Oscillator
400, 6.3 k, 12.5 kHz.
-10/-40 dB



RE-1002 10-1/2" Metal Tape Reel (Silver)
RE-1003 10-1/2" Metal Tape Reel (Gold)
RE-711 7" Metal Tape Reel
RE-1012 10-1/2" Metal Tape Reel (1/2" Tape)
RE-1016 10-1/2" Metal Tape Reel (1" Tape)



TZ-255
Oil Kit



TZ-261
Tape Deck Cleaner Kit



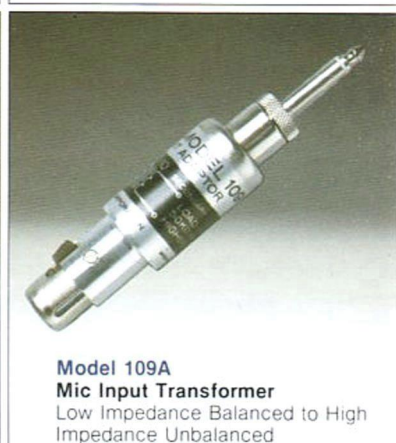
TZ-270N
Stainless Steel Polish



TZ-22
Fader Couplers



CS-606
Adjustable Tape Deck Stand
For all decks except 85-16 & 35-2



Model 109A
Mic Input Transformer
Low Impedance Balanced to High Impedance Unbalanced

OPTIONS

A-2340SX	RC-320	Timer Control Adaptor
	RC-120	Remote Control Unit
A-3440	RC-70	Remote Control Unit
	RX-9	dbx Noise Reduction Unit
	TZ-440	Acryl Dust Cover
80-8	RC-170	Remote Control Unit
	DX-8	dbx Noise Reduction Unit
	T-0407	Portable Case
	VSK-88	Variable Speed Control
	LA-8	8-channel Line Output Amplifier
85-16	RC-15C	Remote Control Unit
	DX-16A	dbx Noise Reduction Unit
	AQ-85C	Auto Cue Unit

M-2A	MB-20	4-channel Meter Bridge
	MODEL 109A	Mic Input Transformer
M-3	T-0406	Portable Case
M-5B	M-5BEX	8-in Expander
	T-0404	Portable Case
M-15	LA-8	8-channel Line Output Amplifier
35-2	RC-70	Remote Control Unit
	RC-350	Timer Control Adaptor
	TZ-480	Acryl Dust Cover
	CS-600	Console Rack
32-2	RC-90	Remote Control Unit
	DX-2B	dbx Noise Reduction Unit
	TZ-550	Acryl Dust Cover
	RM-10A	EIA Rack Mount Kit

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Where Art and Technology Meet.