
JH-24 Series
PROFESSIONAL TAPE RECORDERS
FROM MCI
Scotch

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A few short years ago MCI introduced a radical new concept that made other multitrack recorders obsolete. The design was based on a totally servo controlled transport, all new and all DC. And it made the pioneers of 24 track recording the industry's most imitated designers. Today, independent international surveys rank MCI multitracks as the most popular in the world.

Now, after years of production experience, MCI couples this proven transport with all new electronics for the future - still offering you the best professional tape recorders available at any price.

THE NEW JH-24

- Transformerless record and reproduce amplifiers dramatically improve audio specifications.
- Separate cue amplifier incorporates its own equalization adjustments, assuring flattest cue response and low noise.
- Phase compensation circuitry assures superior phase linearity.
- Spot erasure feature allows easy track cleanup.
- Quartz/Reference capstan drive assures speed accuracy and faultless interlock.
- Separate EQ and bias settings for both speeds (15 ips/30 ips).
- QUIOR system provides noiseless, gapless punch-in.
- Format converts easily to 8, 16 and 24 tracks.
- Sensibly designed to fit through any standard doorway.
- Available with AutoLocator and AutoLock accessories.

TOTALLY NEW ELECTRONICS

Today's professional engineers and recording artists deserve the best, and MCI gives it to them with audio electronics for the future. Transformers have been removed from the record and reproduce electronics, dramatically improving frequency response, transient and phase characteristics.

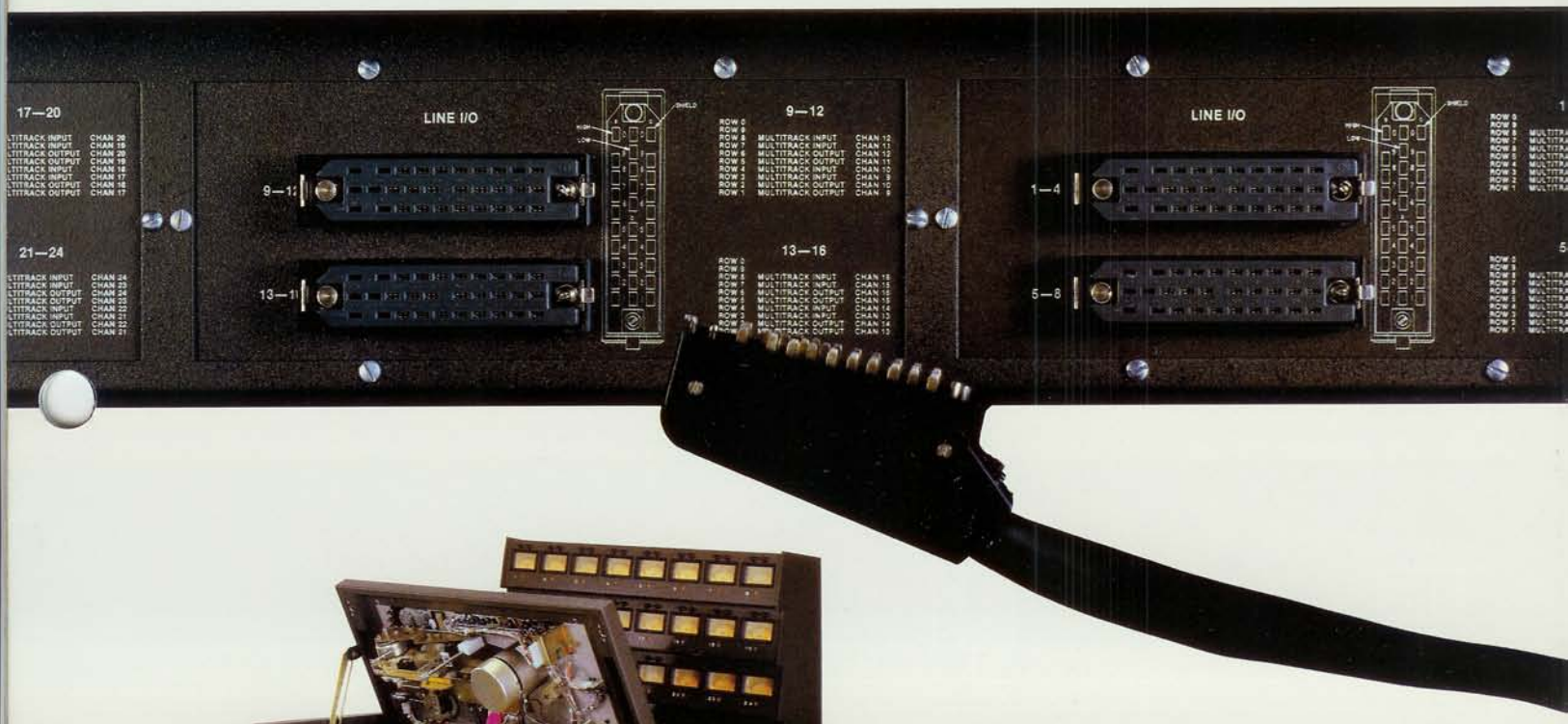
A separate amplifier and equalization for sync playback makes the cue response of the JH-24 better than ever and achieves a noise figure equivalent to reproduce.

For better-than-transformer performance, differential coupling at inputs and outputs yields improved common mode rejection specifications without diminishing audio quality. And op-amp electronics completely eliminate even-order harmonic distortion.

EASY INTERFACING

When MCI pioneered the concept of 24-track recording in the late sixties, the days of three-pin audio connectors were numbered. Suitable enough for two and four track operations, the old way of interfacing multi-signal lines was nothing more than a "make do" situation for today's 16 to 48 track studios. And, once again, MCI became the problem solver.

In the new JH-24, MCI uses convenient DIN Tuchel® multi-way plugs and sockets for quick interface of a 24-track recorder with only six connectors—down from 48. With this rapid connect/disconnect feature, one JH-24 can be easily utilized in a number of control rooms. Tuchel® connectors feature hard silver-plated wiping contacts, a locking device and integral strain relief.



ENGINEERED FOR RELIABILITY, DESIGNED FOR MAINTENANCE

The highest quality components together with MCI's philosophy of excellence place the JH-24 among the most reliable professional recorders ever built. And the transport's design eliminates many of the "routine" mechanical adjustments and lubrication requirements encountered with other systems. The transport tilts up for service with all control logic circuitry easily accessible. To further simplify troubleshooting, an L.E.D. annunciator board is provided to indicate control logic status. Audio electronics are all on plug-in cards, eight channels to each pull-out drawer. Front and rear access is provided, making for easy alignment and maintenance.

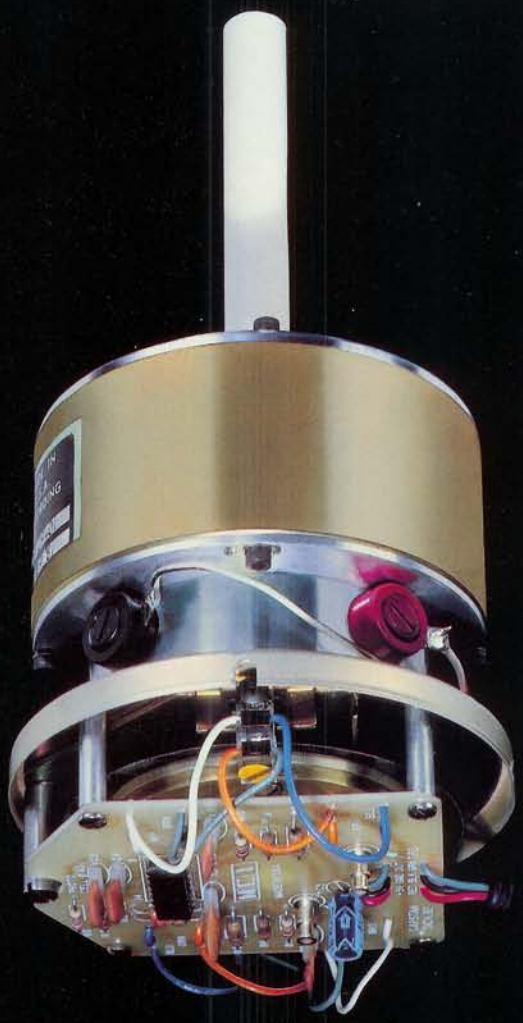
QUARTZ REFERENCED DC CAPSTAN MOTOR

Unlike many manufacturers of professional recording equipment, MCI insists on the kind of consistent quality, reliability and accuracy that can only be achieved by designing and building capstan motors in-house. Three unique features set these motors apart.

Rock-hard, non-magnetic capstan shaft. This tough ceramic material provides an unbendable capstan of unusual dimensional stability. Unlike conventional steel shafts, it will not "polish" with continuous use.

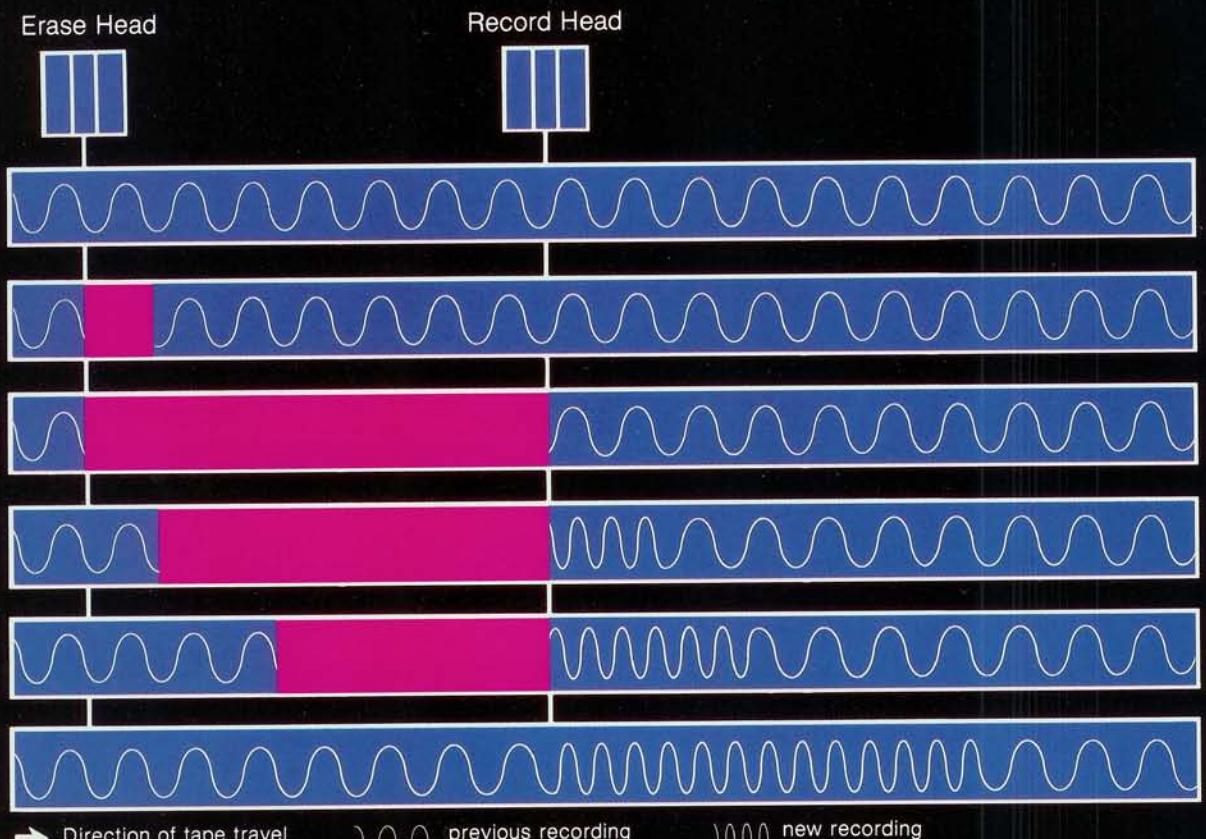
Close tolerances for speed accuracy. To eliminate errors resulting from tolerance build-up, the shafts are assembled to armatures, run-in and then ground in the motor to a tolerance of just a few hundreds of millionths of an inch.

Photopositive mylar disc. This is a key part of the optical tachometer which continuously monitors capstan speed. With every revolution of the capstan, 500 lines interrupt dual photosensors to yield the resolution necessary for unerring speed accuracy and faultless interlock capability.



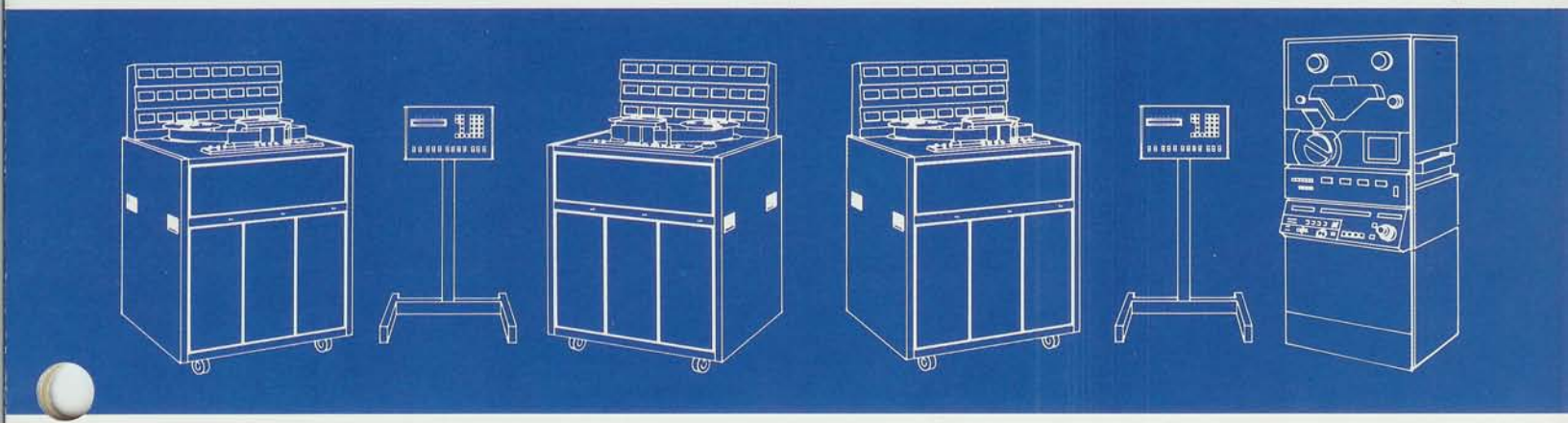
QUIOR SYSTEM FOR NOISELESS PUNCH-INS

Noiseless, gapless punch-in capability is provided by MCI's unique QUiet Initiation Of Record (QUIOR) system. QUIOR timing is switched with tape speed to ensure optimum operation. Its operation is described below.



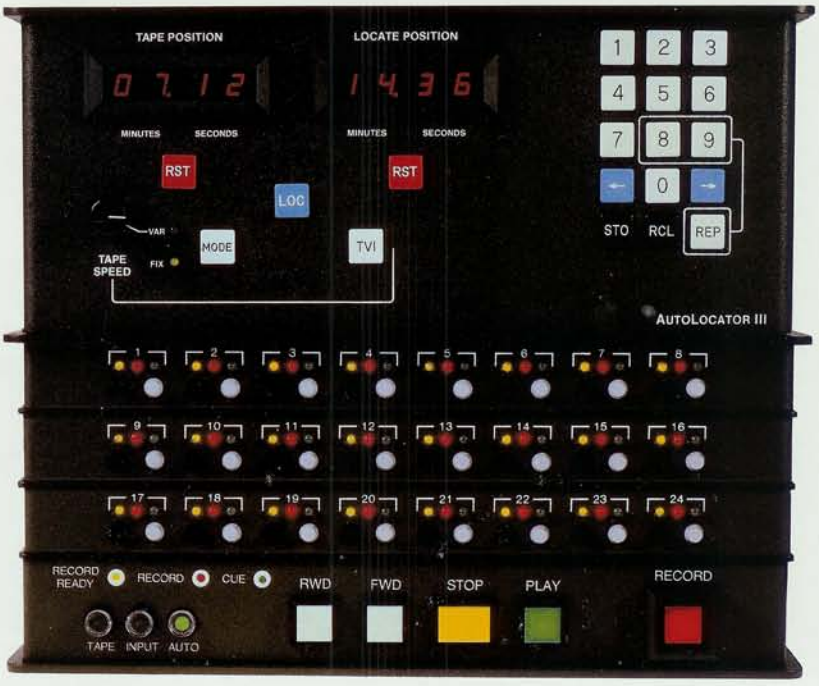
JH-45 AUTOLOCK

Another concept pioneered by MCI, this microprocessor based SMPTE/EBU generator/reader/synchronizer allows you to use any MCI recorder for audio/audio, video/audio or film/audio synchronization requirements. Not only does the JH-45 make these functions easy and reliable, but it also allows you to synchronize two JH-24's for full 46-track capability. The unit also features a built-in AutoLocator with the features and flexibility described below, allowing its associated JH-24 to be used alone while retaining full function capability.



AUTOLOCATOR III

Since the day MCI invented the first AutoLocator we've been adding features steadily in response to your needs and requests. Proof lies in the performance and capabilities of today's microprocessor based AutoLocator III. Offering functions for storage, retrieval and location of tape position, this fully remote unit features 10 programmable memories, a programmable tape shuttle function and a built-in Tape Velocity Indicator (TVI) with variable speed control and readout of true speed in both ips and quarter semi-tones.



FULL FUNCTION REMOTE CONTROL.

Standard on the JH-24, the full function remote control features L.E.D. status indicators and independent record ready and sync controls. An Automatic Switching Mode changes monitoring of any sync channel to input during stop or record, simplifying the job of overdubs.

SPOT ERASURE

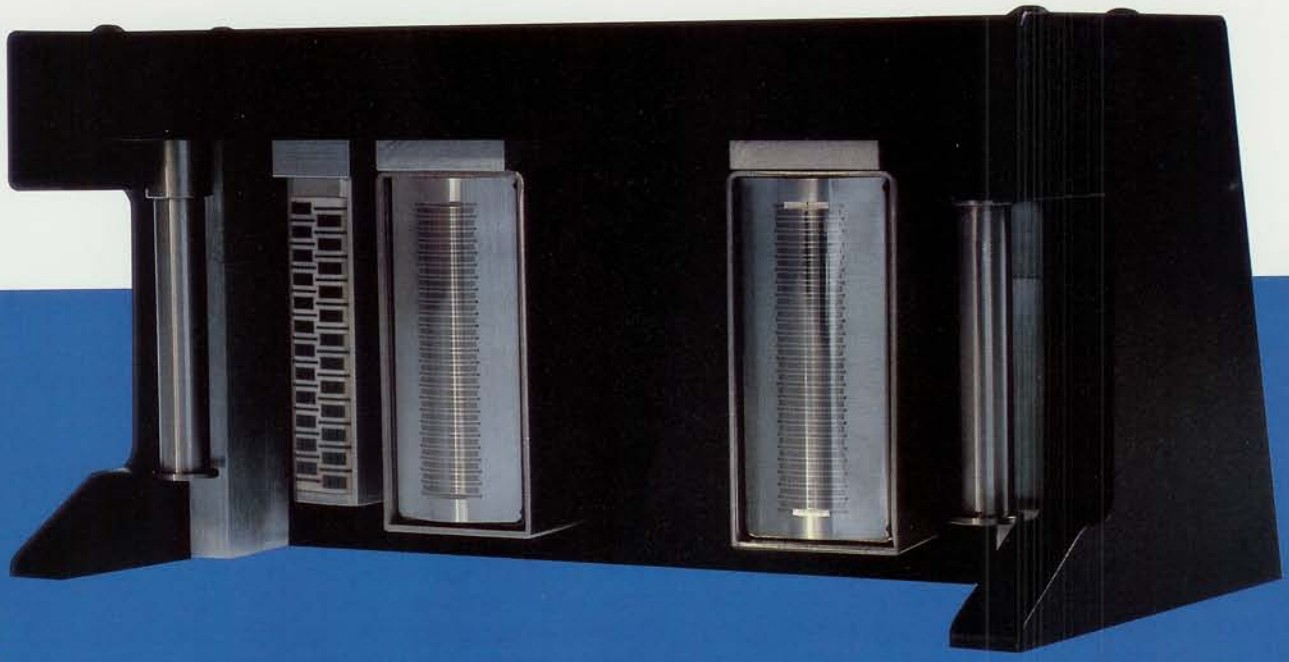
Use of the individual "channel bias defeat" switches in conjunction with "pinch roller defeat" switch permits quick and easy track cleanup.

14″ REEL CAPACITY

A torque limit switch optimizes spooling motor torque for 14″, 10½″ and 7″ reels. Offering the accuracy of full TTL control logic, the all DC Total Servo Transport features Manual Velocity Control (MVC), a touch sensitive "joystick" to control spooling speed for editing or slow winding of valuable master tapes.

UNIQUE HEAD ASSEMBLY

Tested and proven by years of daily use in studio and mobile applications, the exclusive spring loaded head mounting system of the JH-24 guarantees stability and simplifies alignment. Azimuth, Zenith and Wrap adjustments are non-interactive, dramatically shortening the time required for head alignment and saving wear on expensive alignment tapes. MCI heads are designed for minimum gap scatter, thereby improving intertrack phasing, and erase heads are full track width to assure maximum erasure.



ALL DC TOTAL SERVO TRANSPORT

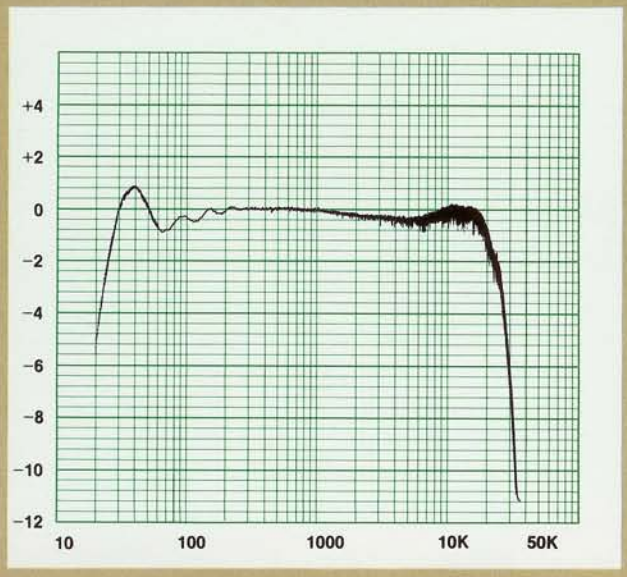
Sophisticated electronics control the MCI Total Servo Transport, holding speed accuracy to .02% and maintaining tape tension ± ¼ oz. in play anywhere in the reel. Cool running DC motors are used for reeling and capstan drive, each monitored by a precision tachometer. Dynamic braking is used in all modes except fail-safe.

PERFORMANCE TEST RESULTS

We invite you to compare the JH-24 Specifications with those of any other multitrack recorder on the market today. The JH-24... unsurpassed in a field of professionals. These curves were taken using a standard production model JH-24. When properly maintained the recorder will meet these performance specifications throughout its lifetime.

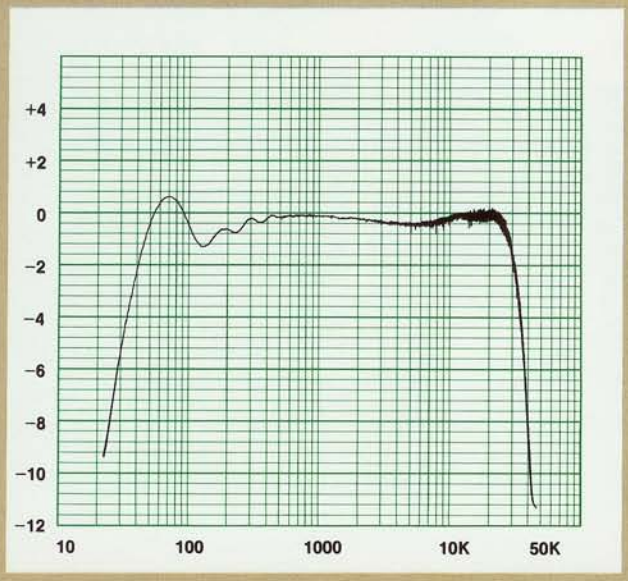
Unless otherwise specified, the following conditions apply to all graphs.
Speed: 30 ips
Overbias: 1.0 dB @ 10 kHz
Fluxivity: + 4dBv = 250 nWb/m
Speed: 15 ips
Overbias: 3.0 dB @ 10 kHz
Fluxivity: + 4dBv = 250 nWb/m

Tape: 3M Scotch 226



RECORD/REPRODUCE RESPONSE 15 Ips

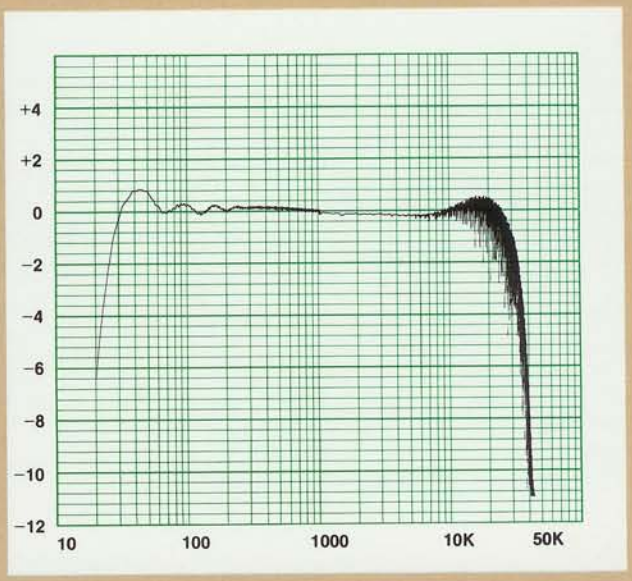
These graphs represent the record/reproduce frequency response (over tape, with constant input level). They demonstrate the flat, extended frequency response of the JH-24 recorder.



RECORD/REPRODUCE RESPONSE 30 Ips

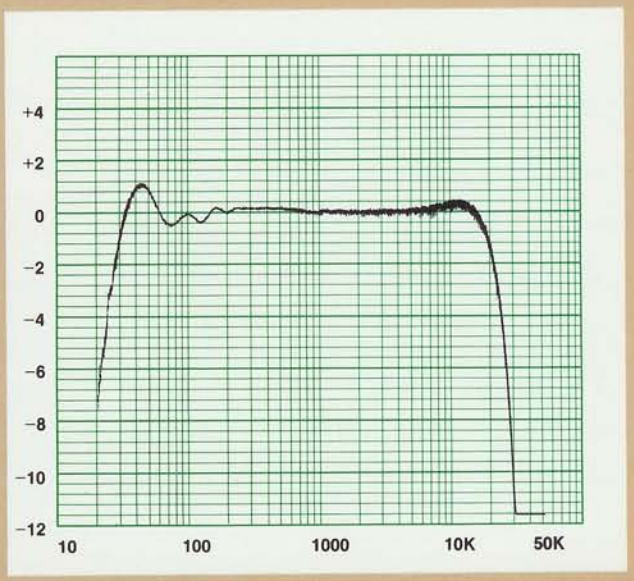
MONO SUM RESPONSE 15 Ips

Gap scatter is minimized with high specification head designs developed by MCI. This phase linearity, held throughout the electronics circuitry, is amply demonstrated by this response curve-which stays flat even at high frequencies when summing the output of all 24 tracks to mono.



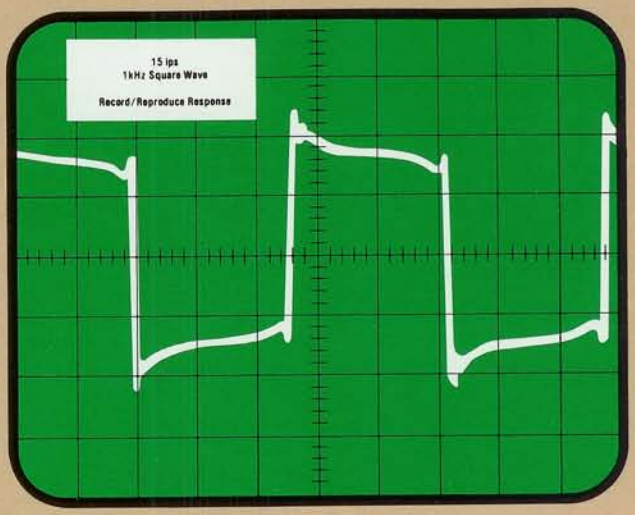
CUE RESPONSE 15 Ips

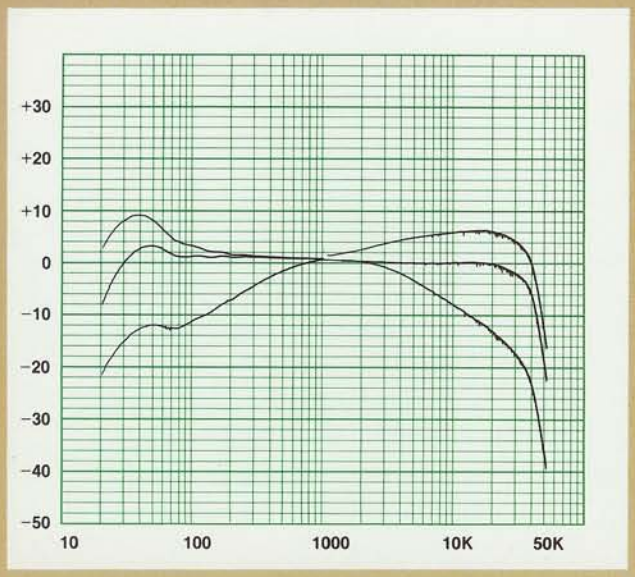
A separate amplifier and equalization enables optimum cue response. This design approach makes cue response virtually identical to normal reproduce, essential when "track bouncing" is employed as a production technique. Superior cue response also prevents fatigue during extended overdub sessions.



SQUARE WAVE RESPONSE

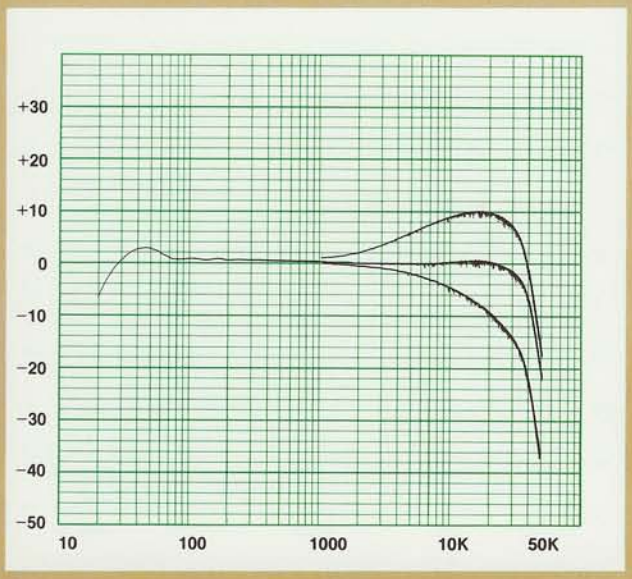
Square wave response demonstrates both transient response and phase linearity throughout the recording process. The JH-24's superior square wave response assures excellent reproduction of live dynamic material and reduces copy-to-copy degradation.





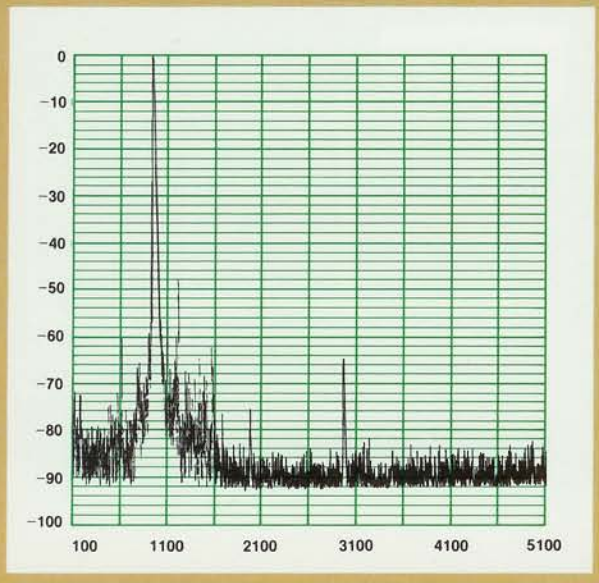
REPRODUCE EQUALIZER RANGE 15 Ips

A wide range of reproduce equalization adjustments ensures that the JH-24 will conform to NAB, IEC, or AES standard response curves. There is sufficient range to compensate for head wear and to align to reference tones on aged or degraded tape copies.



RECORD EQUALIZER RANGE 15 Ips

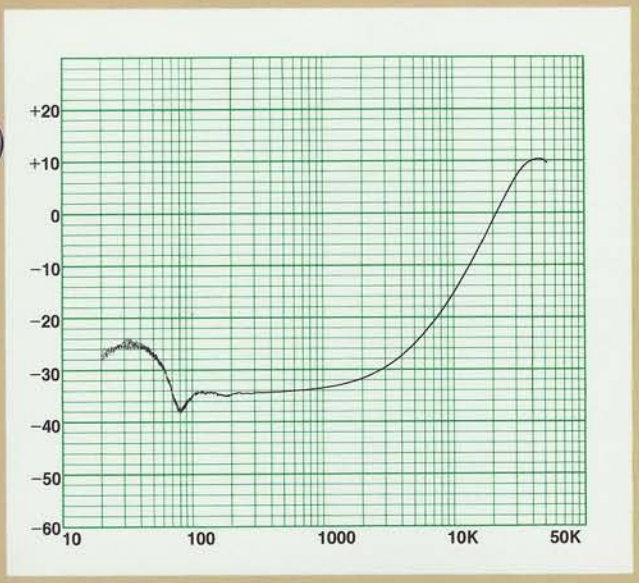
The record circuitry is aligned to complement the reproduce response previously aligned to match standard curves. The JH-24 features a wide range of adjustment to allow alignment using any of the wide variety of tapes available today, or those which may be offered tomorrow.



DISTORTION/PURITY OF SIGNAL

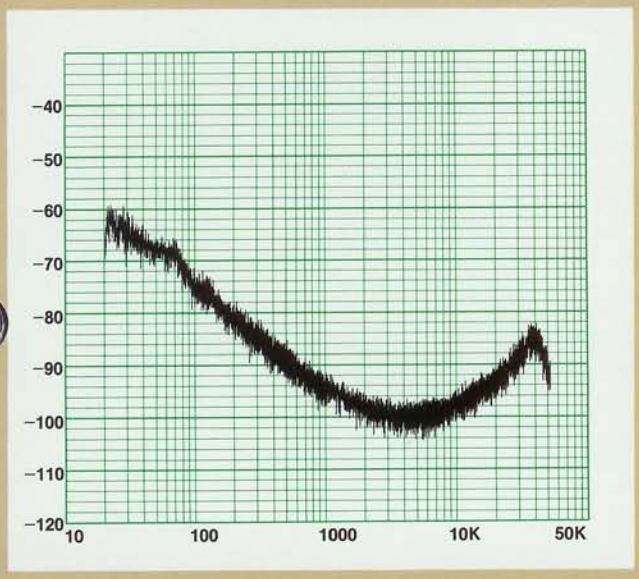
Both Wow/Flutter and distortion degrade the purity of recorded signals. Using the latest techology op amp design, the JH-24 eliminates "second order" distortion* while maintaining a wide dynamic range and a very low noise floor. In combination with the closed loop servo capstan drive system, this provides purity of signal unsurpassed by any other professional multitrack recorder.

* "Odd order" harmonic distortion and modulation noise are functions of the tape used and operating levels chosen.



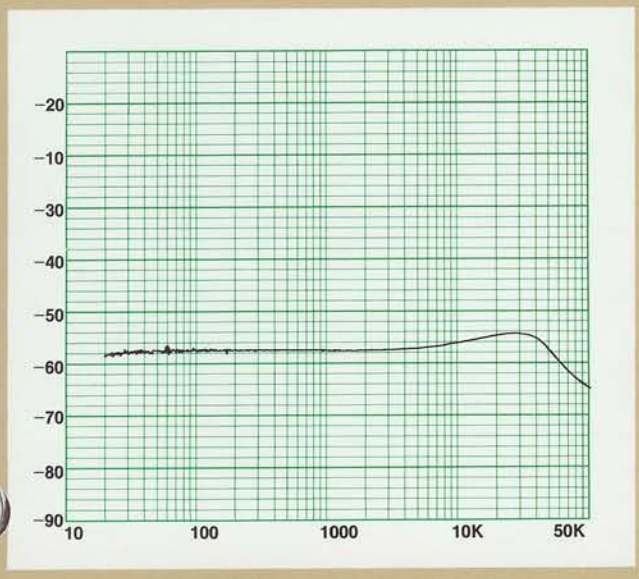
RECORD/CUE CROSSTALK 15 Ips

This type of crosstalk is the leakage from one track in record to an adjacent track in cue, and is primarily a function of the heads. The JH-24 exhibits very low crosstalk even during overdubs, due to its active crosstalk reduction circuitry.



STANDING NOISE/REPRO MODE

Use of the latest technology and highest specification components ensures low noise generated internally by the electronic circuitry. Additional shielding utilized in the JH-24 provides exceptionally low noise figures.



COMMON MODE REJECTION RATIO

Common mode rejection is the ability of the electronics circuitry to reject any signal applied equally to both sides of its balanced input, signals such as RF, hum, etc. The JH-24 design ensures a high common mode rejection ratio, making it ideal for use in the most adverse operational atmosphere.

JH-24 Specifications

Frequency Response

	Record/Reproduce	
30 ips, AES	36 Hz - 26 kHz	+1.5/-3 dB
15 ips, NAB	30 Hz - 26 kHz	+1.5/-2 dB
	Record/Sync	
30 ips, AES	36 Hz - 20 kHz	+1.5/-3 dB
15 ips, NAB	30 Hz - 20 kHz	+1.5/-2 dB

Signal-to-Noise
Record/Reproduce, reference to 510 nWb/m

	Unweighted, 20 Hz - 20 kHz 8/16 track	24 track
30 ips, AES	-67 dB	-64 dB
15 ips, NAB	-63 dB	-60 dB
	Weighted, dB(A)	
30 ips, AES	-72 dB	-69 dB
15 ips, NAB	-68 dB	-65 dB

Distortion
Harmonic distortion, 510 nWb/m, 1 kHz fundamental

3rd harmonic:	30 ips, AES	.35%
	15 ips, NAB	.50%
2nd harmonic:	30 ips, AES	.10%
	15 ips, NAB	.10%
3% 3rd harmonic:	30 ips, AES	1040 nWb/m
fluxivity level	15 ips, NAB	1020 nWb/m

Distortion is primarily a function of tape formulation and bias setting used. All specifications are typical and may vary.

Bias Frequency
210 kHz

Erase Frequency
105 kHz

Depth of Erasure
At 1 kHz better than 80 dB

Amplifier Electronics

Input impedance	10k ohms balanced
Output impedance	120 ohms balanced
Output clipping	+26 dBm

TRANSPORT

Speeds

Fixed	15 and 30 ips
Variable	±20% around fixed speeds

Configurations

1 inch	8 track
2 inch	16 track
2 inch	24 track

Reel sizes
7½, 10 and 14 inch
NAB hubs

Tension
8 oz. ± ¼ at all play speeds beginning to end of reel

Long term speed stability
better than .02%

Wow Flutter
15ips less than .04% DIN 45507 weighted
30ips less than .03% DIN 45507 weighted

Stop time from fast wind
4 seconds, 10½ inch reel

Start time
to .1% DIN 45507 flutter, 14" reels

30 ips	1200 msec
15 ips	600 msec

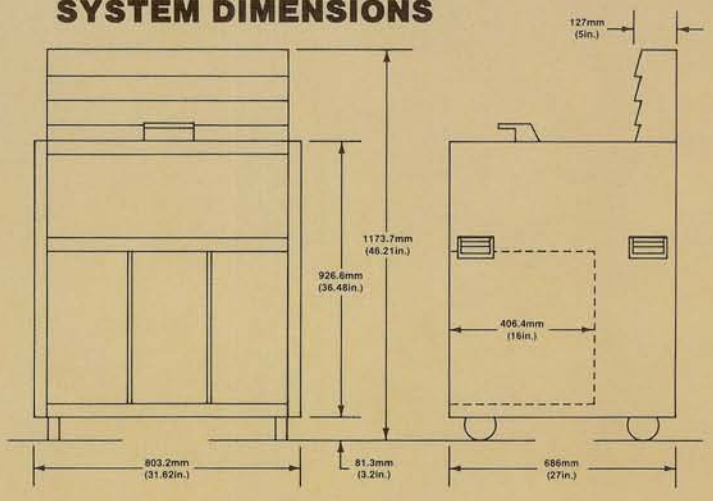
Rewind time

2400 ft.	85 seconds
4800 ft.	140 seconds

SYSTEM WEIGHT

JH-24-8	410 lbs.
JH-24-16	474 lbs.
JH-24-24	538 lbs.

SYSTEM DIMENSIONS



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