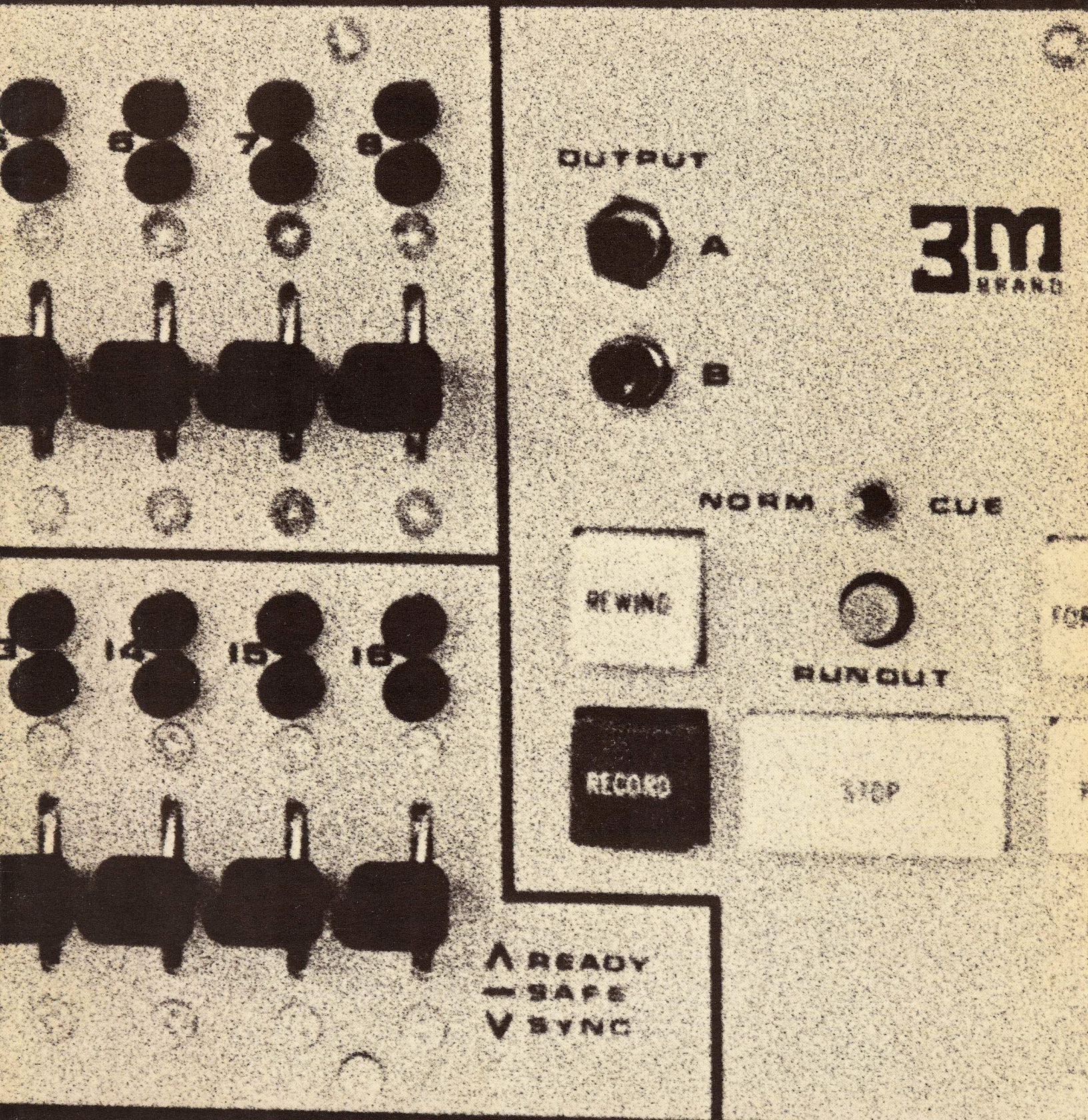


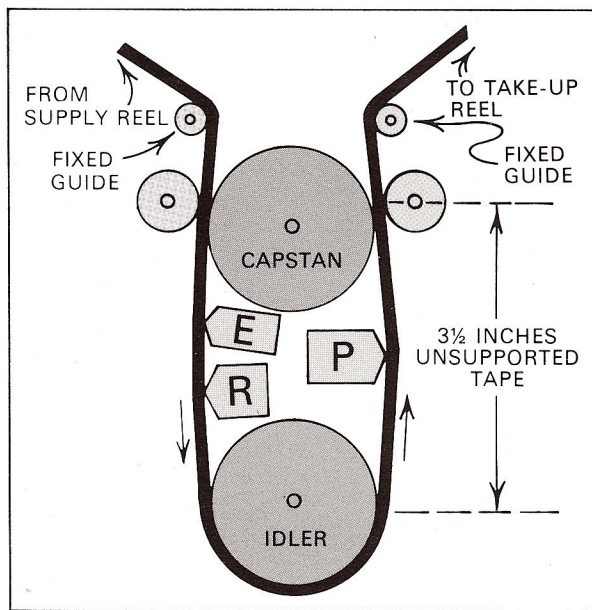
3M BRAND PROFESSIONAL AUDIO RECORDING EQUIPMENT



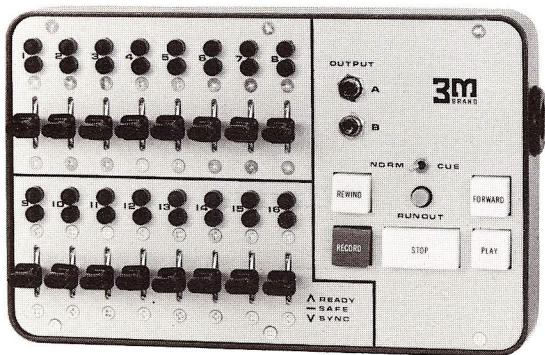


3M Brand Professional Audio Recording Systems are the most complete and advanced line of professional audio recorders made. Whether you're looking for a 16-track for mastering or a full-track, you can't buy better performance, more convenience or higher quality than 3M. □ Models in the line include

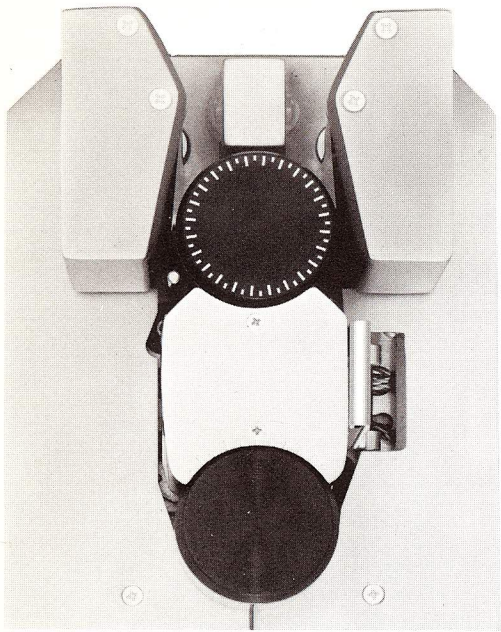
16-, 8-, 4-, 2- and full-track units to cover just about any audio recording requirements that you'll ever have. Whether you buy the low end or the high end of the line, you'll get the same consistent quality, convenience and performance because all models use the same transport and electronics. □ The transport is a precision piece of equipment that gives you foolproof, convenient and safe tape handling. It provides convenient tape threading and



editing and handles tape without the high tensions necessary with other drive techniques. Sophisticated transport logic eliminates the possibility of damage to



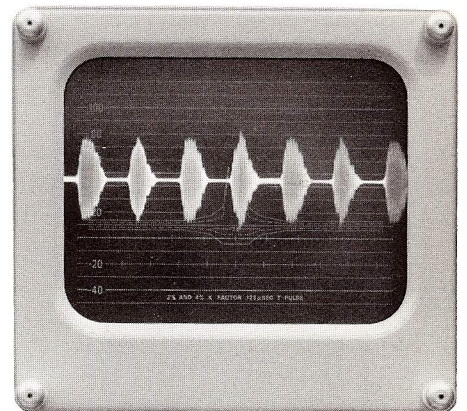
the possibility of damage to



the tape or machine. And for even more convenience, the 16- and 8-track models come with a remote overdub unit for remote console operation, providing individual mode selection of any or all tracks plus duplicate transport controls. □ The tape drive is the unique 3M Isoloop[®], a differential capstan drive that pro-

vides the lowest flutter and wow in the industry. It reduces unsupported tape length to just 3½", maintains tape tension automatically and makes editing easier and faster than with any other equipment available.

□ Combining the benefits of Isoloop with sophisticated electronic techniques, 3M recording systems give you the best signal-to-noise and frequency response in the industry. You can



check this out on your test equipment, but there's an easier way—just listen. The difference in performance between any model



in our line and any other audio recording equipment made—full-track through 16-track—is great enough for you to hear. □ And that's what it's all about, isn't it?



MODEL PAR 410 M-64

1/4 Inch 2 Track Recorder/Reproducer

SIGNAL-TO-NOISE RATIO:

	Standby	Biased Tape
Normal	65 dB	62 dB

70 mil track width 20 Hz - 20 kHz bandwidth, with reference to 3% maximum third harmonic distortion level at 700 Hz, using tape specified below.

FREQUENCY RESPONSE:

7.5 ips reproduce	±2 dB 30 Hz - 12 kHz
7.5 ips record/ reproduce	±2 dB 30 Hz - 12 kHz
15 ips reproduce	±2 dB 30 Hz - 15 kHz
15 ips record/ reproduce	±2 dB 30 Hz - 15 kHz

FLUTTER:

Speed (ips)	Flutter Band (Hz)	Maximum Flutter (rms)
30	0.5 to 200	0.05%
	0.5 to 5000	0.08%
15	0.5 to 200	0.06%
	0.5 to 5000	0.08%
7-1/2	0.5 to 200	0.10%
	0.5 to 5000	0.15%

NOTE: All measurements of flutter made by recording a tone on machine under test, rewinding and measuring flutter on replay. Flutter measurement is maximum cumulative unweighted.

Phasing: On all channels signal input to output polarity is maintained. 1 mil wavelength phase error less than 90° between any two tracks.

Channel separation: Channel to channel crosstalk separation is greater than 50 dB at 500 cycles (zero VU).

Phase correction: Playback amplifier includes phase rotation circuit to optimize square wave and transient response for each speed.

Bias and erase oscillator. Master oscillator on tape transport supplies 120 kHz low impedance bus feeding individual bias and erase power amplifiers for each channel.

Speed: 7-1/2 and 15 ips standard 15 and 30 ips available.

Timing accuracy: ±0.1%

Start time: Less than 1.0 seconds to reach sync speed.

Stop time: 1.0 second from play or record mode.

Rewind time: 1.7 minutes for 2,400 feet.

Transport controls: Operating controls located on lower edge of transport.

SIZE AND WEIGHT:

Height: 53-3/4 inches.
Width: 27 inches.
Depth: 22-1/2 inches.
Weight: Approximately 250 pounds



MODEL PAR 410 M-64

1/2 Inch 4 Track Recorder/Reproducer

SIGNAL-TO-NOISE RATIO:

	Standby	Biased Tape
Normal	65 dB	62 dB

70 mil track width 20 Hz - 20 kHz bandwidth, with reference to 3% maximum third harmonic distortion level at 700 Hz, using tape specified below.

FREQUENCY RESPONSE:

7.5 ips reproduce	±2 dB 30 Hz - 12 kHz
7.5 ips record/ reproduce	±2 dB 30 Hz - 12 kHz
15 ips reproduce	±2 dB 30 Hz - 15 kHz
15 ips record/ reproduce	±2 dB 30 Hz - 15 kHz

FLUTTER:

Speed (ips)	Flutter Band (Hz)	Maximum Flutter (rms)
30	0.5 to 200	0.05%
	0.5 to 5000	0.08%
15	0.5 to 200	0.06%
	0.5 to 5000	0.08%
7-1/2	0.5 to 200	0.10%
	0.5 to 5000	0.15%

NOTE: All measurements of flutter made by recording a tone on machine under test, rewinding and measuring flutter on replay. Flutter measurement is maximum cumulative unweighted.

Phasing: On all channels signal input to output polarity is maintained. 1 mil wavelength phase error less than 90° between any two tracks.

Channel separation: Channel to channel crosstalk separation is greater than 50 dB at 500 cycles (zero VU).

Phase correction: Playback amplifier includes phase rotation circuit to optimize square wave and transient response for each speed.

Bias and erase oscillator. Master oscillator on tape transport supplies 120 kHz low impedance bus feeding individual bias and erase power amplifiers for each channel.

Speed: 7-1/2 and 15 ips standard 15 and 30 ips available.

Timing accuracy: ±0.1%

Start time: Less than 1.0 seconds to reach sync speed.

Stop time: 1.0 second from play or record mode.

Rewind time: 1.7 minutes for 2,400 feet.

Transport controls: Operating controls located on lower edge of transport.

SIZE AND WEIGHT:

Height: 53-3/4 inches.
Width: 27 inches.
Depth: 22-1/2 inches.
Weight: Approximately 250 pounds.



MODEL PAR 510 M-56

1 Inch 8 Track Recorder/Reproducer (Nonconvertible)

SIGNAL-TO-NOISE RATIO:

	Standby	Biased Tape
Normal	67 dB	62 dB
Sync	60 dB	60 dB

70 mil track width 20 Hz - 20 kHz bandwidth, with reference to 1% maximum third harmonic distortion level at 700 Hz, using tape specified below.

FREQUENCY RESPONSE:

7.5 ips reproduce	±2 dB 30 Hz - 12 kHz
7.5 ips record/ reproduce	±2 dB 30 Hz - 12 kHz
15 ips reproduce	+1, -2 dB 30 Hz - 15 kHz
15 ips record/ reproduce	+1, -2 dB 30 Hz - 15 kHz

SYNC RESP. +1, -4 dB 50 Hz - 15 kHz

FLUTTER:

Speed (ips)	Flutter Band (Hz)	Maximum Flutter (rms)
30	0.5 to 200	0.05%
	0.5 to 5000	0.08%
15	0.5 to 200	0.06%
	0.5 to 5000	0.08%
7-1/2	0.5 to 200	0.09%
	0.5 to 5000	0.13%

NOTE: All measurements of flutter made by recording a tone on machine under test, rewinding and measuring flutter on replay. Flutter measurement is maximum cumulative unweighted.

Phasing: On all channels signal input to output polarity is maintained. 1 mil wavelength phase error less than 90° between any two tracks.

Channel separation: Channel to channel crosstalk separation is greater than 50 dB at 500 cycles (zero VU).

Phase correction: Playback amplifier includes phase rotation circuit to optimize square wave and transient response for each speed.

Bias and erase oscillator. Master oscillator on tape transport supplies 120 kHz low impedance bus feeding individual bias and erase power amplifiers for each channel.

Speed: 7-1/2 and 15 ips standard 15 and 30 ips available.

Timing accuracy: ±0.1%

Start time: Less than 1.0 seconds to reach sync speed.

Stop time: 1.0 second from play or record mode.

Rewind time: 1.7 minutes for 2,400 feet.

Transport controls: Operating controls located on lower edge of transport.

SIZE AND WEIGHT:

Height: 53-3/4 inches plus 7 inches when remote control is mounted on meter panel.
Width: 27 inches.
Depth: 22-1/2 inches.
Weight: Approximately 300 pounds.



MODEL PAR 510 M-56

2 Inch 16 Track Recorder/Reproducer

SIGNAL-TO-NOISE RATIO:

	Standby	Biased Tape
Normal	67 dB	62 dB
Sync	60 dB	60 dB

70 mil track width 20 Hz - 20 kHz bandwidth, with reference to 1% maximum third harmonic distortion level at 700 Hz, using tape specified below.

FREQUENCY RESPONSE:

7.5 ips reproduce	±2 dB 30 Hz - 12 kHz
7.5 ips record/ reproduce	±2 dB 30 Hz - 12 kHz
15 ips reproduce	+1, -2 dB 30 Hz - 15 kHz
15 ips record/ reproduce	+1, -2 dB 30 Hz - 15 kHz

SYNC RESP. +1, -4 dB 50 Hz - 15 kHz

FLUTTER:

Speed (ips)	Flutter Band (Hz)	Maximum Flutter (rms)
30	0.5 to 200	0.05%
	0.5 to 5000	0.08%
15	0.5 to 200	0.06%
	0.5 to 5000	0.08%
7-1/2	0.5 to 200	0.09%
	0.5 to 5000	0.13%

NOTE: All measurements of flutter made by recording a tone on machine under test, rewinding and measuring flutter on replay. Flutter measurement is maximum cumulative unweighted.

Phasing: On all channels signal input to output polarity is maintained. 1 mil wavelength phase error less than 90° between any two tracks.

Channel separation: Channel to channel crosstalk separation is greater than 50 dB at 500 cycles (zero VU).

Phase correction: Playback amplifier includes phase rotation circuit to optimize square wave and transient response for each speed.

Bias and erase oscillator. Master oscillator on tape transport supplies 120 kHz low impedance bus feeding individual bias and erase power amplifiers for each channel.

Speed: 7-1/2 and 15 ips standard. Other speeds available on special order.

Timing accuracy: ±0.1%

Start time: Less than 1.0 seconds to reach sync speed.

Stop time: 1.0 second from play or record mode.

Rewind time: 1.7 minutes for 2,400 feet.

Transport controls: Operating controls located on lower edge of transport.

Remote control: Permits full operation of the transport from two locations.

SIZE AND WEIGHT:

Height: 53-3/4 inches plus 7 inches when remote control is mounted on meter panel.
Width: 27 inches.
Depth: 22-1/2 inches.
Weight: Approximately 304 pounds (16 track).

Mincom Division **3M** COMPANY

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