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AEG  
TELEFUNKEN  
magnetophon

**TECHNICAL INFORMATION**

# Magnetophon 21-1/2" Professional Tape Recorder

# AEG

## Purpose

The M21-1/2" professional tape recorder (short for Magnetophon 21-1/2") is a modern, professional system which is designed for ease of operation through the utilization of the most sophisticated technology currently available.

It is designed for top quality master recording and reproduction in radio and television studios as well as in the recording industry and professional studios in general.

The M21-1/2" tape recorder was developed from the proved M21 standard professional machine and it serves the purpose of analog audio recording on 1/2 inch tape.

The microcomputer enables tape transport and amplifier operation to be programmed, thus greatly increasing the system's range of applications.

The machine is available in stereo, two-track or two-out of four-track recording for A-wind (oxide coating inside).

Two speeds may be selected and switched over on the front panel from the four speeds available.

At a tape speed of 15/30 ips the stereo version is preferred to the production of disk mastering or at a tape speed of 7.5/15 ips the two-out-of-four-track version is preferred to the production of cassette mastering.

For the two audio channels the track selection may be determined as you like: track 1 and 2 or track 1 and 3.

Operation is possible with NAB hub lock for NAB reels up to 12 1/2 inch diameter.

Since it is small and takes up little space the M21 is particularly suitable for installation in 19" racks and carrying cases and can of course be fitted into existing consoles. Installed in the Vario stand it is even possible to adjust height and angle for operation in a sitting or standing position. The recorder operates in any position between the horizontal and vertical.

*Additional informations are available in our brochure "magnetophon 21".*



Fig. 1 Magnetophon 21-1/2" as a table model - A-wind shown

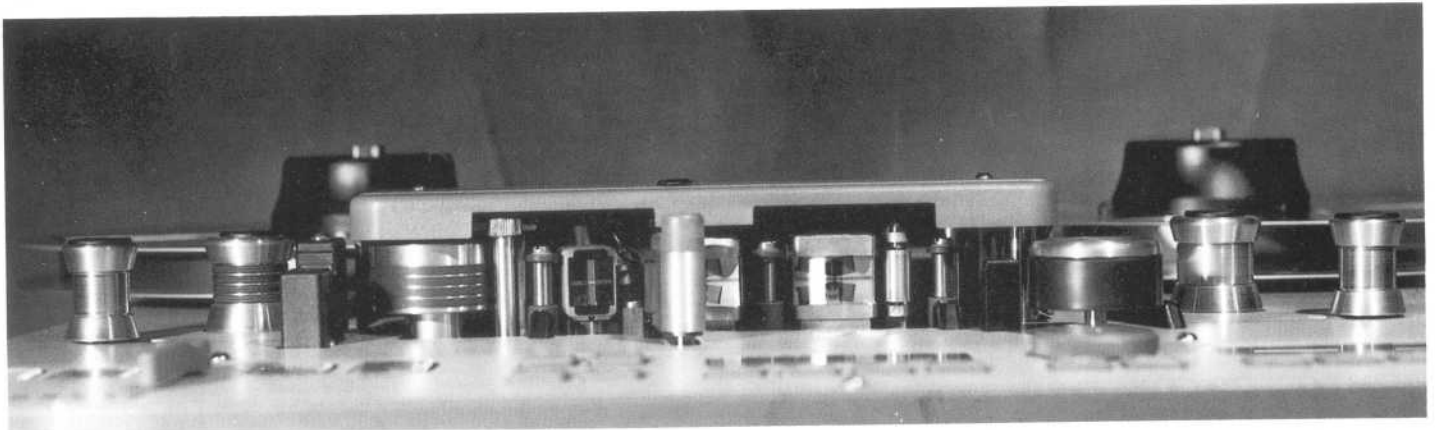


Fig. 2 Magnetophon 21-1/2": Head assembly of highest precision

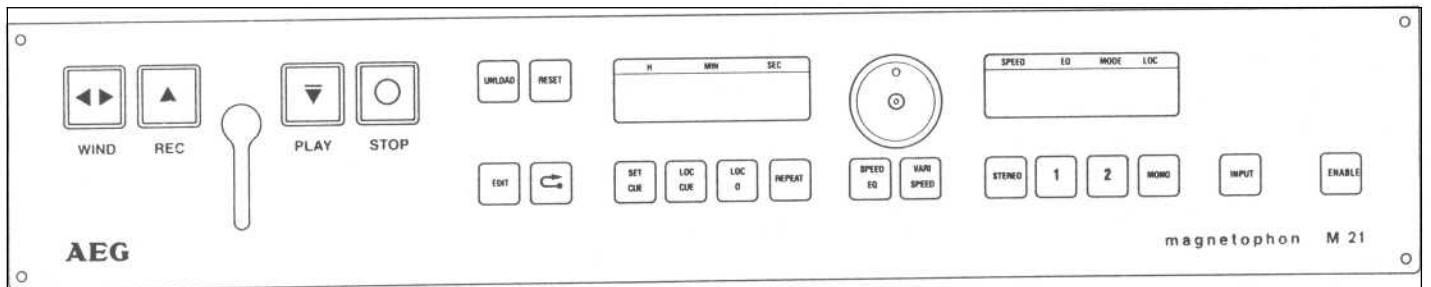


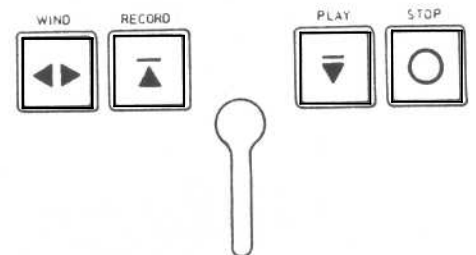
Fig. 3 Practical microprocessor supported operating and indicating comfort

Operating Panel

Push-button function

Push-button designation

Fast wind  
Record  
Playback  
Stop



Unloading tape from heads



Rewind at search speed



Setting the tape timer to 0



Editing



Tape speed/equalization switch-over



Setting of Cue



Search to Cue



Search to Zero



Loop operation



Variable tape speed



Mono



Stereo (track 1 and 2)



Track 1



Track 2



Input to Output



Function enabling button:  
tape speed/equalization  
switch-over, vari-speed  
mono, stereo, track 1, track 2, input



## Specifications

Tape transport	Motor	3-motor tape transport 1 electronically controlled, brushless crystal oscillator reference dc motor for direct capstan drive 2 electronically controlled dc reel motors
	Tape speeds	3.75 / 7.5 / 15/30 ips (all machines so equipped) 2 speeds may be selected on the front panel from the 4 speeds available
	Varispeed	all tape speeds are continuously adjustable with a range of $\pm 10\%$
	Deviation of average speed from nominal speed	max. 0.2%
	Wow and flutter	peak weighted (DIN 45507, IEC. Publ. 368, ANSI) measured using EMT 420 at 30 and 15 ips max. $\pm 0.04\%$ at 7.5 ips max. $\pm 0.06\%$ at 3.75 ips max. $\pm 0.1\%$
	Tape slip	max. 0.1%
	Tape width	12.7 mm (1/2 inch)

	Hub diameter	max. 12 1/2" $\triangleq$ 3960 ft (1200 m) standard tape $\triangleq$ 5940 ft (1800 m) long play tape
	Tape coating	inside (A-wind)
	Applicable hubs and reels	NAB reels, 4 1/2" (114 mm) core diameter (with adapter)
	Starting time at 15 ips and 10 1/2" spool (2500 ft tape)	to attainment of $\pm 0,1\%$ wow and flutter: 0.7 sec
	Fast wind time	max. 80 sec for 2500 ft (760 m) tape with spool (variable wind speed)
	Stopping time out of fast wind with full 10 1/2" spool (2500 ft tape)	stop max. 5 sec end of tape max. 6 sec
	Spooling tape tension	1 N (3.6 ozs force)
	Electronic tape timer	5-digit LCD indicator in hours, minutes and seconds for all tape speeds, with negative sign below zero
	Tape time error	max. 0.3%
	Timer overshoot after tape end run-off	max. 1 sec
	Tape transport and amplifier control	microcomputer with 8085 micro-processor
	Mode selection indication	alpha-numeric, 16-digit LCD
	Remote control interface	rewind, fast forward, record, playback, stop, fader contact, enable fader contact, 1 reserve software-defined serial interface (optional)
Amplifier	Equalization at 30 ips  at 15 ips  at 7.5 ips  at 3.75 ips  (all equalizations combined switchable) 2 speed/equalization combinations are selectable at the operating panel	17.5 $\mu$ s (prop. AES) or 35 $\mu$ s (old DIN) 35 $\mu$ s (CCIR) or 50 + 3180 $\mu$ s (NAB) 70 $\mu$ s (CCIR) or 50 + 3180 $\mu$ s (NAB) 90 + 3180 $\mu$ s (NAB) or 50 + 3180 $\mu$ s (NAB-EE)
	Input	electronically balanced (differential input circuit) (optional floating with input transformer)
	Input level	+6 dBm (nominal value) or adjustable from 0 dBm to +12 dBm (max. 24 dBm)
	Input impedance	min. 10 k $\Omega$ between 20 Hz and 20 kHz (min. 5 k $\Omega$ between 30 Hz and 16 kHz with input transformer)

	Output	electronically balanced (differential output circuit) (optional floating with output transformer)			
	Output level	+6 dBm (nominal value), adjustable to +12 dBm (at 510 nWb/m), max. output level +24 dBm			
	Output impedance	max. 40 $\Omega$ between 20 Hz and 20 kHz (max. 40 $\Omega$ between 30 Hz and 16 kHz with output transformer) min. load impedance: 150 $\Omega$ up to +18 dBm 200 $\Omega$ up to +24 dBm			
	Erase/bias frequency	205 kHz with crystal reference			
Overall characteristics (These data refer to modern tapes such as 3M 226, Ampex 456, BASF LGR 50, Agfa PEM 468 or equivalent)	Frequency response				
	at 30 ips:	30 Hz ... 20 kHz	$\pm 1.5$ dB		
		40 Hz ... 18 kHz	$\pm 1$ dB		
	at 15 ips:	20 Hz ... 20 kHz	$\pm 1.5$ dB		
		30 Hz ... 18 kHz	$\pm 1$ dB		
	at 7.5 ips:	20 Hz ... 16 kHz	$\pm 1.5$ dB		
		20 Hz ... 14 kHz	$\pm 1$ dB		
	at 3.75 ips	20 Hz ... 10 kHz	$\pm 1.5$ dB		
		20 Hz ... 8 kHz	$\pm 1$ dB		
	Signal-to-noise ratio RMS, A-weighted according to DIN 45633 (IEC Publ.179) referred to 1020 nWb/m and NAB equalization	30	15	7.5	3.75 ips
	Stereo	78	77	—	— dB
	Two-track	78	77	—	— dB
	Four-track (any 2 channels out of 4 tracks)	—	—	71	70 dB
	Quasi-peak, weighted according to CCIR 468 referred to CCIR equalization)	30	15	7.5	3.75 ips
	Stereo (510 nWb/m)	59	58	—	— dB
	Two-track (510 nWb/m)	59	58	—	— dB
	Four-track (200 nWb/m) (any 2 channels out of 4 tracks)	—	—	—	— dB
	Total harmonic distortion	stereo and two-track (referred to 510 nWb/m)			max. 0.6%
		Four-track (referred to 200 nWb/m)			max. 0.4%
	Crosstalk rejection measured at 1 kHz in accordance with DIN 45521	stereo version:			min. 65 dB
		two-track version:			min. 65 dB
		two-out-of-four-track version:			
		- adjacent channels:			min. 60 dB
		- unadjacent channels:			min. 70 dB
	Erase attenuation	min. 85 dB at 1 kHz (510 nWb/m)			
	AC mains	100, 110, 120, 200, 220 or 240 V (+5%/-10%) (by changing solder connections) 50 or 60 Hz			
	Power consumption at nominal voltage	160 VA max. 250 VA			

Ambient temperature	+5°C to +45°C cold start (-5°C) ready for operation after 5 minutes			
Operating positions	any horizontal to vertical			
Dimensions, weights	Height	Width	Depth	Weight kg
Chassis	277+50 (11"+2")	483 (19")	525 (20.6")	45 (100 lbs)
Carrying case (approx.)	405 (16")	510 (20.1")	600 (23.6")	14.8 (33 lbs)
Console 700	920 (36.2"2)	730 (28.7")	605 (23.6")	42 (92.4 lbs)
Vario stand (max. dimensions)	1320 (52")	664 (26")	800 (31.5")	32 (70.4 lbs)
	* Max. height at mounting in 19" rack. When installed in console 700 the upper edge height is the same as that of M15A.			

*AEG's offering also includes a wide range of units and systems for the electronic media, such as:*

*Video editing systems for magnetic picture recording and video control recording - independent from the tape formats and machines' manufacturers, remote control of studio equipment and systems, remote control units for studio cameras, electronic programmable colour correction units, transmitting and aerial systems for all transmission frequencies, and so on.*

*These systems are future-oriented, because they are future-outlined. Please contact us.*

## **We are easy to reach.**

One of our representatives is certainly in your vicinity, too. Please contact the representatives abroad or our central address below. One of them will respond at once.

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