Technical Specifications M 051 (temp.) page 1

Type of device:

stereo master tape recorder

Tape transport:

processor-controlled 3-motor direct drive with 1/4" or 1/2" or 1" tape width and international layering. Cast aluminum base plate with a structure depth of 30 mm

Reel motors: two 110 mm BLDC double pancake motors with rotor angle controlled sinusoidal commutation

Capstan motor: one BLDC axial flux motor with rotor angle controlled sinusoidal commutation

Electric brakes controlled by tape tension control

BLDC servo drive pinch roller

Hour meter (counts only during recording, playback and spooling)

Horizontal operation position

Tape path:

2 x 64 mm deflection rollers on the left and right and one 44 mm tape stabilizing roller on the left. Tape tension scales left and right with 2 deflection rollers, one deflection roller each between reel and tape tension scale. Hard chrome plated 14 mm capstan shaft and 45 mm ball bearing mounted pinch roller

Tape speed:

19.05 cm/s and 38.1 cm/s and 76.2 cm/s

Tolerance of the set speed: < 0.03 %

Variable tape speed: +/- 10 % at all speeds

Variable tape speed at editing: – 95 cm/s to + 95 cm/s

Reel size:

up to a maximum of 355 mm reels
Minimum core diameter of reel: 60 mm

Wow & Flutter (weighted):

19.05 cm/s < 0.06 %
38.1 cm/s < 0.03 %
76.2 cm/s < 0.02 %

Tape slip (at every reel size):

1/4": < 0.04 %
1/2": < 0.07 %
1": < 0.09 %

Spooling time:

3 speeds programmable: 1 m/s (archive), 3 m/s, 10 m/s

Tape tension:

Reproduce and Record:
1/4": 0.8 N
1/2": 1.4 N
1" : 2.9 N
(measured at left reel)

Spooling (all tape widths):
Low and mid speed: 1.2 N
High speed: 0.6 N
(measured at the undriven reel)

Head assembly:

interchangeable head assembly by 2 screws

1/4" and 1/2":
full track 2- gap erase head, record head and playback head stereo with 2.75 mm or 5.25 mm track width. 5 tape guides and 2 precision bearing stabilization roller. Tape lifter driven by stepper motor

1":
full track 2- gap erase head, record head and playback head stereo with 11.50 mm track width and 2.00 mm separating track. 3 tape guides and 2 precision bearing stabilization roller. Tape lifter driven by stepper motor

Tape transport electronics:

processor-controlled, 2 sensors for tape tension

Real-time counter via high-resolution incremental encoder in time format hrs / min / sec, 100/sec, Autolocator function

Autostop can be switched off during play and spooling by leader tape

Audio electronics:

shielded amplifier magazine accessible from the front

One main board with two shielded amplifier PCBs for playback, two shielded amplifier boards for recording and one shielded board for oscillator, plugged on 64 pin female connector on the mainboard

132 kHz oscillator frequency for erase head and bias for all speeds

Playback and record amplifier to calibrate via conductive plastic trimmers

Inputs:

inputs electronically balanced via XLR with spindle trimmers +/- 20 dB adjustable
Input impedance: 2 MΩ balanced, unbalanced 5 MΩ

Outputs:

outputs electronically balanced via XLR with spindle trimmers +/- 24 dB adjustable
Output impedance: 25 Ω
Output impedance balance: > 75 dB/1 kHz, > 60 dB/10 kHz

Equalizing:

Playback:
19.05 cm/s: CCIR (IEC 1) 70 µs
38.1 cm/s: CCIR (IEC 1) 35 µs
76.2 cm/s: AES (IEC 2) 17.5 µs

Record:
19.05 cm/s: CCIR (IEC 1) 70 µs
38.1 cm/s: CCIR (IEC 1) 35 µs
76.2 cm/s: AES (IEC 2) 17.5 µs

Frequency response(rec-repro measured with RTM SM 900):

1/4":
19.05 cm/s: 30 Hz - 13000 Hz +/- 1 dB
19.05 cm/s: 30 Hz - 18000 Hz +/- 2 dB
38.1 cm/s: 50 Hz - 20000 Hz +/- 1 dB
38.1 cm/s: 30 Hz - 20000 Hz +/- 2 dB
76.02 cm/s: 60 Hz - 20000 Hz +/- 1 dB
76.02 cm/s: 40 Hz - 22000 Hz +/- 2 dB

1/2":
19.05 cm/s: 30 Hz - 13000 Hz +/- 1 dB
19.05 cm/s: 30 Hz - 18000 Hz +/- 2 dB
38.1 cm/s: 40 Hz - 20000 Hz +/- 1 dB
38.1 cm/s: 30 Hz - 20000 Hz +/- 2 dB
76.02 cm/s: 60 Hz - 20000 Hz +/- 1 dB
76.02 cm/s: 40 Hz - 22000 Hz +/- 2 dB

1":
19.05 cm/s: 30 Hz - 13000 Hz +/- 1 dB
19.05 cm/s: 30 Hz - 18000 Hz +/- 2 dB
38.1 cm/s: 40 Hz - 20000 Hz +/- 1 dB
38.1 cm/s: 30 Hz - 20000 Hz +/- 2 dB
76.02 cm/s: 60 Hz - 20000 Hz +/- 1 dB
76.02 cm/s: 40 Hz - 22000 Hz +/- 2 dB

Distortion (1 kHz rec-repro measured with RTM SM 900 valid for all tape widths):

19.05 cm/s 250 nWb/m < 1 %
19.05 cm/s 320 nWb/m < 1 %

38.1 cm/s 320 nWb/m < 1 %
38.1 cm/s 514 nWb/m < 1 %
38.1 cm/s 1000 nWb/m < 1.5 %

76.2 cm/s 320 nWb/m < 1 %
76.2 cm/s 514 nWb/m < 1 %
76.2 cm/s 1000 nWb/m < 1.5 %

Signal to noise ratio rec-repro(measured with RTM SM 900, RMS weighted):

1/4”(track width 2.75 mm):
19.05 cm/s 250 nWb/m > 61 dB
19.05 cm/s 320 nWb/m > 63 dB
19.05 cm/s 514 nWb/m > 67 dB

38.1 cm/s 320 nWb/m > 66 dB
38.1 cm/s 514 nWb/m > 70 dB
38.1 cm/s 1000 nWb/m > 76 dB

76.2 cm/s 320 nWb/m > 67 dB
76.2 cm/s 514 nWb/m > 71 dB
76.2 cm/s 1000 nWb/m > 77 dB

1/2”(track width 5.25 mm):
19.05 cm/s 250 nWb/m > 64 dB
19.05 cm/s 320 nWb/m > 66 dB
19.05 cm/s 514 nWb/m > 70 dB

38.1 cm/s 320 nWb/m > 70 dB
38.1 cm/s 514 nWb/m > 74 dB
38.1 cm/s 1000 nWb/m > 80 dB

76.2 cm/s 320 nWb/m > 71 dB
76.2 cm/s 514 nWb/m > 75 dB
76.2 cm/s 1000 nWb/m > 81 dB

1”(track width 11.50 mm):
19.05 cm/s 250 nWb/m > 67 dB
19.05 cm/s 320 nWb/m > 69 dB
19.05 cm/s 514 nWb/m > 73 dB

38.1 cm/s 320 nWb/m > 73 dB
38.1 cm/s 514 nWb/m > 77 dB
38.1 cm/s 1000 nWb/m > 83 dB

76.2 cm/s 320 nWb/m > 74 dB
76.2 cm/s 514 nWb/m > 78 dB
76.2 cm/s 1000 nWb/m > 84 dB

Crosstalk:

1/4“(0.75 mm sep. track) > 62 dB at 1000 Hz
1/2“(2.00 mm sep. track) > 65 dB at 1000 Hz
1“ (2.00 mm sep. Track) > 64 dB at 1000 Hz

Crackling disorder:

> 58 dB (At start and stop of recording for all tape widths)

Erase efficiency (1kHz/514 nWb/m):

1/4”:
> 83 dB at 1000 Hz, 19.05 cm/s
> 80 dB at 1000 Hz, 38.1 cm/s
> 78 dB at 1000 Hz, 76.2 cm/s

1/2”:
> 82 dB at 1000 Hz, 19.05 cm/s
> 80 dB at 1000 Hz, 38.1 cm/s
> 77 dB at 1000 Hz, 76.2 cm/s

1”:
> 81 dB at 1000 Hz, 19.05 cm/s
> 79 dB at 1000 Hz, 38.1 cm/s
> 77 dB at 1000 Hz, 76.2 cm/s

Power supply:

PSU with toroidal transformers shielded between the reel motors with 36 V DC unregulated and 12 V DC regulated and 2 x +/- 18 V precision audio power supply

Connection via IEC connector 3-pole
Protection class 1
240 V / 50 Hz European standard
182 W maximum power consumption (brake from spooling)

Operating ambient conditions:

Air humidity: 30 - 80 % relative humidity (non-condensing)
Ambient temperature: 5 – 45°C

Weight and dimensions:

Without rolling aluminium rack:
62 KG 645 mm x 525 mm x 260 mm (W x H x D)

Including rolling aluminium rack:
81 KG 740 mm x 525 mm x 950 mm (W x H x D)