(01) 04/06

Studio Master 900

Specially designed to fulfil the highest quality requirements of
world class music studios for analogue recording for

- multitrack and
- mastering recording.

Offering

- high output
- wide dynamic range,
- high level uniformity up to the highest frequencies.
- low print-through and
- excellent DC noise

Audio Studio

RMG International

Technical Data Studio Master SM 900

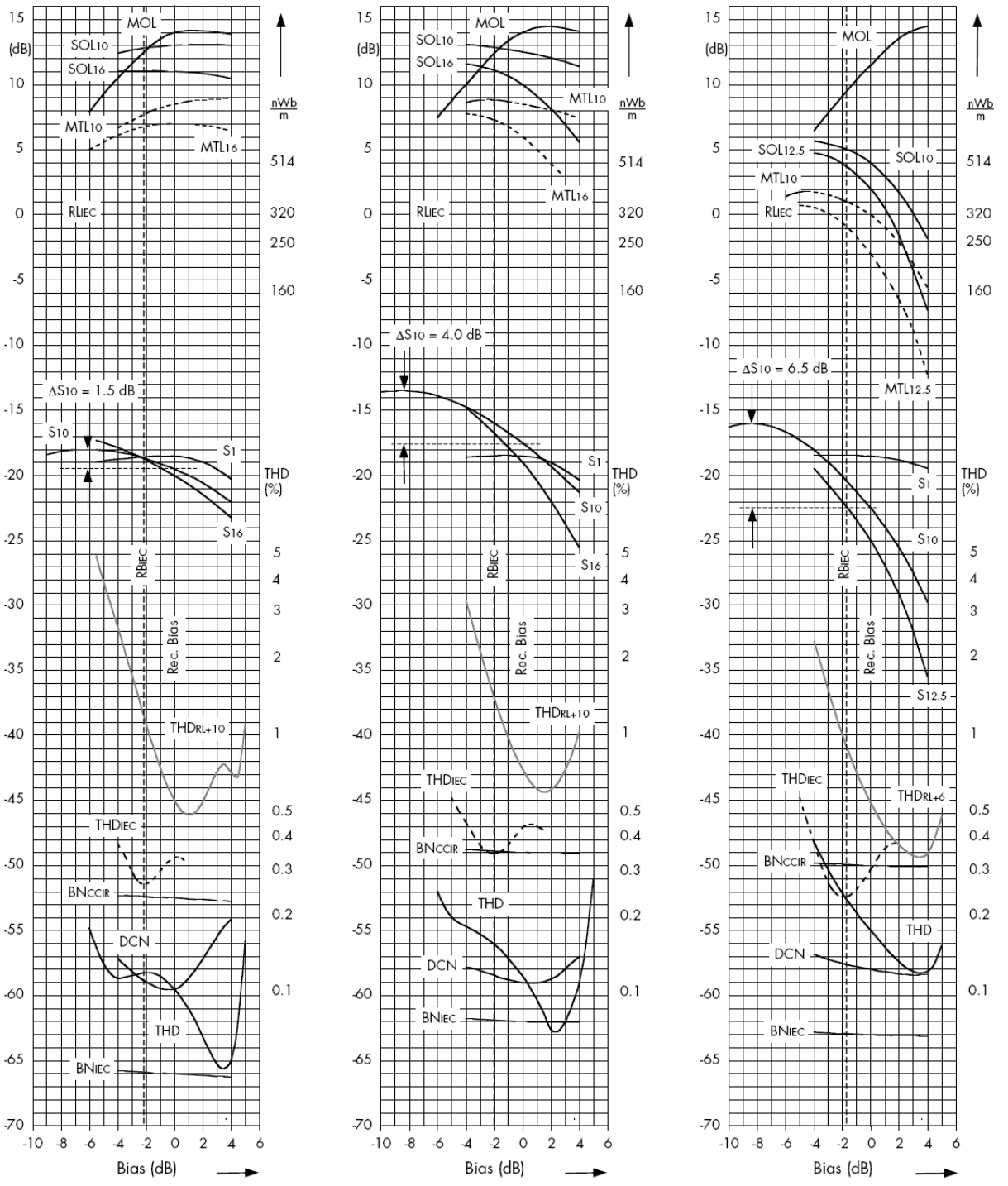
(01) 04/06

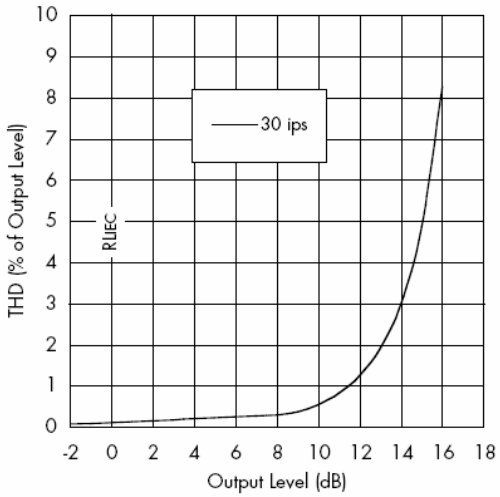
1. **Recording Performance Specifications** (depending on bias settings)

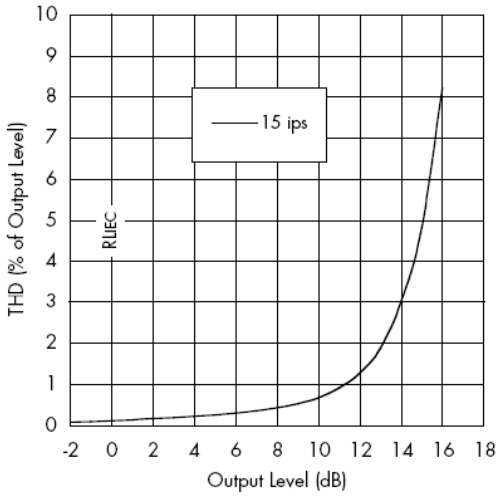
Tape speed	**76.2 cm / s** **30 ips**
Recording head gap length	7.0 µm
Playback head gap length	3.0 µm
Equalisation	17.5 µs
Reference level	320 nWb/m

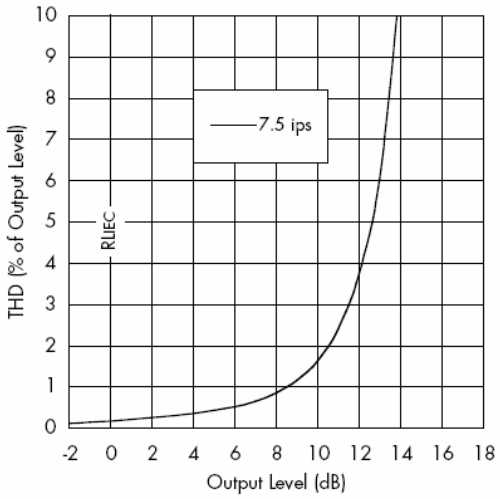
Tape speed	**38.1 cm / s** **15 ips**
Recording head gap length	7.0 µm
Playback head gap length	3.0 µm
Equalisation	50+3180 µs
Reference level	320 nWb/m

Tape speed	**19.05 cm / s** **7,5 ips**
Recording head gap length	7.0 µm
Playback head gap length	3.0 µm
Equalisation	50+3180 µs
Reference level	320 nWb/m

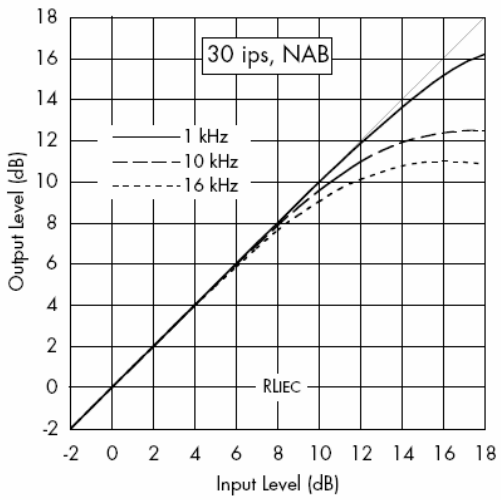


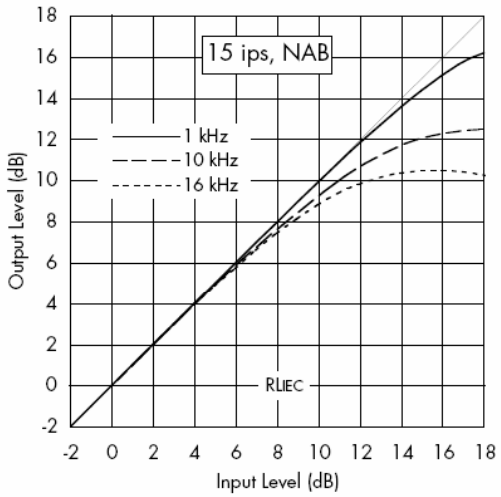


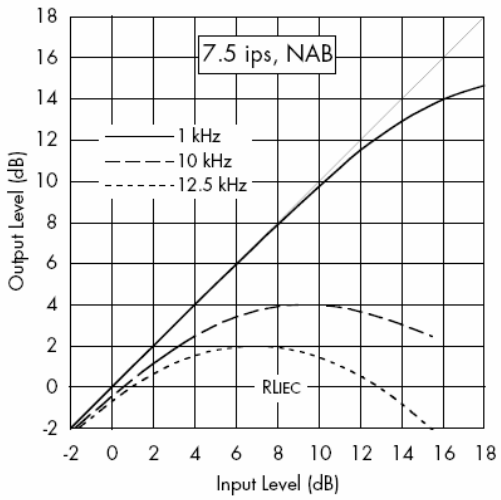




Level versus Third Harmonic Distortion Factor at frequency 1 kHz for tape speeds 30 ips (76.2 cm/s), 15 ips (38.1 cm/s) and 7½ ips (19.05 cm/s). See also Reference 2.1.







Input Level versus Output Level at the given frequencies 1 kHz, 10 kHz, and 16 kHz (resp. 12.5 kHz for 7½ ips) for tape speeds 30 ips (76.2 cm/s), 15 ips

2. Measurement Conditions

Tape speed		76.2 cm/s 30 ips	38.1 cm/s 15 ips	19.05 cm/s 7.5 ips	Ref.
Record head:		Studer	Studer	Studer	1.1
Gap length		7.0 µm (0.25 mil)	7.0µm) (0.25 mil	7.0µm (0.25 mil)	
Track width		6.3 mm (1/4")	6.3 mm (1/4")	6.3 mm (1/4")	
Playback head:		Studer	Studer	Studer	1.1
Gap length		3.0 µm (0.12 mil)	3.0 µm (0.12 mil)	3.0 µm (0.12 mil)	
Track width		2.575 mm	2.575 mm	2.575 mm	
Playback equalisation		17.5 µs (NAB)	50+3180 µs (NAB)	50+3180 µs (NAB)	1.2
RL_{IEC}	IEC Reference Level at 1kHz	320 nWb/m	320 nWb/m	320 nWb/m	1.3
	IEC reference tape:batch	MT 82472	MT 82472	A 342 D	
	IEC reference tape bias definition	$Min.THD_{320}$	$Min.THD_{320}$	$Min.THD_{320}$	1.4
RB_{IEC}	IEC reference bias	-2,2 dB	-2,0 dB	-1.8 dB	1.5
Rec.Bias	Recommended bias setting	0.0 dB	0.0 dB	0.0 dB	
ΔS10	**Sensitivity drop for recommended bias setting**	1.5 dB	4.0 dB	6.5 dB	1.6

3. Recording Performance Specifications

The table below presents the main parameters in the recommended bias setting.
All figures given represent nominal values.

MOL	Maximum Output Level at 1 kHz	14.0 dB	14.0 dB	11.5 dB	
SOL_{10}	Saturation Output Level at 10 kHz	13.0 dB	12.5 dB	4.0 dB	
$SOL_{12.5}$	Saturation Output Level at 12.5 kHz			2.0 dB	
SOL_{16}	Saturation Output Level at 16 kHz	11.0 dB	10.0 dB		
MTL_{10}	Maximum Twin tone Level at 10 kHz	8.5 dB	8.5 dB	0.0 dB	2.1
$MTL_{12,5}$	Maximum Twin tone Level at 12.5 kHz			-3.0 dB	2.1
MTL_{16}	Maximum Twin tone Level at 16 kHz	7.0 dB	6.0 dB		2.1
S_1	Relative tape Sensitivity at 1 kHz	1.5 dB	1.5 dB	1.5 dB	2.2
S_{10}	Relative tape Sensitivity at 10 kHz	2.5 dB	2.0 dB	3.0 dB	2.2
$S_{12.5}$	Relative tape Sensitivity at 12.5 kHz			2.0 dB	2.2
S_{16}	Relative tape Sensitivity at 16 kHz	2.5 dB	2.5 dB		2.2
THD	Third Harmonic Distortion ratio at RL_{IEC}	-59.5 dB	-58.5 dB	-55.0 dB	2.1
	Third Harmonic Distortion factor at RL_{IEC}	0.11 %	0.12 %	0.18 %	2.1
$THD_{RL+10dB}$	Third Harm.Dist.ratio at RL_{IEC}+10dB	-35.0 dB	-32.6 dB		2.1
	Third Harm.Dist.factor at RL_{IEC}+10dB	0.56 %	0.47 %		2.1
THD_{RL+6dB}	Third Harm.Dist.ratio at RL_{IEC}+6dB			-39.2 dB	2.1
	Third Harm.Dist.factor at RL_{IEC}+6dB			0.55 %	2.1
DCN	DC noise,weighted, rel.to RL_{IEC}	-59.5 dB	-59.0 dB	-58.0 dB	
BN_{IEC}	Bias Noise level (IEC 94;A-weighted)	-66.0 dB	-62.0 dB	-63.0 dB	2.3
BN_{CCIR}	Bias Noise level (CCIR 468/3-weighted)	-52.5 dB	-49.0 dB	-50.0 dB	2.3
MOL/BN_{IEC}	Dynamic range	80.0 dB	76.0 dB	74.5 dB	2.4
MOL/BN_{CCIR}	Dynamic range	66.5 dB	63.0 dB	61.5 dB	2.4
P	Print-through (print-effect)	58.5 dB	56.5 dB	58.0 dB	2.5

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4. Magnetic Properties

				Ref.
H_C	Coercivity	29.5 kA/m	370 Oe	3.1
B_{RS}	Retentivity	154 mT	1540 G	3.2
Φ	Saturation flux	2320 nWb/m	292 mM/mm	3.3
	Orientation	longitudinal		

5. Physical Properties

Base material	Polyester		
Tape widths available	6.3 /12.7 /25.4 /50.8 mm	¼, ½, 1, 2 inch	4.1
Tolerances of tape width	+0.0 /-0.06 mm	+0.0 /-2.4 mil	4.1
Base thickness	30.0 µm	1.18 mil	4.2
Coating thickness	19.0 µm	0.75 mil	4.2
Total thickness	52.0 µm	2.05 mil	4.2
Backcoating	black		
Surface resistance of the magnetic coating	<10,000 MΩ	<10 GΩ	
Surface resistance of the back coating	<100 kΩ		
Load for elongation of 3 %(F3)per 6.3 mm (1/4") tape	≥ 20 N	≥ 61 MPa	4.3
Breaking tensile strength per 6.3 mm (1/4") tape	≥ 30 N	≥ 91 MPa	4.3

6. References

The data in this publication are based on test methods described in IEC Publication 94. References are given only in the case of deviations or particularities.

1.1 For the measurements magnetic heads are used whose properties are very similar to the standard reference heads specified in IEC Publication 94-5. Record heads with a gap length of 7 µm (0.25 mil) and playback heads with a gap length of 3 µm (0.12 mil) are required.

1.2 Playback equalisation on the tape testing equipment is adjusted to provide a flat frequency response of the output voltage when playing back the frequency response section of the relevant calibration tape for the selected tape speed and equalisation.

1.3 RL_{IEC} (IEC reference level): The reference level is obtained when playing back the reference level section of the relevant IEC calibration tape for the selected tape speed. The reference level corresponds to a magnetic flux in the tape per metre trackwidth of 320 nWb/m.

1.4 IEC reference tape bias definition: Using the relevant IEC reference tape and heads according to Ref. 1.1, the bias current providing the minimum third harmonic distortion ratio for a 1 kHz signal recorded at the reference level is the reference bias setting.

1.5 RB_{IEC} (IEC reference bias): These data represent the ratio of the bias for the relevant IEC reference tape (see Ref. 1.4) to the recommended bias for the tape under test (see Ref. 1.6).

1.6 ΔS10 (Sensitivity drop for recommended bias setting): Operationally, the recommended bias is set while recording an input signal of 10 kHz at –20 dB. Based on the peak of the sensitivity curve S10, the bias is increased until the playback level is reduced by the given value ΔS10.

2.1 MTL and THD (Maximum Twin tone Level and Third Harmonic Distortion): For MTL measurement the frequency distance of the primary tones is 40 Hz. During the THD measurement the playback output is held both at IEC reference level (see Ref. 1.3), and at the increased output level RL+...dB. From the corresponding curves the distortion factor can be obtained directly as a percentage of the output level. (The dBscale can only be used for RL_{IEC} as the output level. In order to derive the distortion ratio in dB for increased output levels at RL+...dB, this output level has to be subtracted from the value read in dB. These resulting values in dB are given in the table).

2.2 S (Sensitivity): All the sensitivity curves are measured using a constant record current, which is necessary to obtain an output level of approximately –20 dB for a 1 kHz input signal. A record equalisation is not used. The distances between the sensitivity curves thus reflect the record equalisation necessary to achieve a flat frequency response. The values given in the table represent the sensitivity of the tape under test at the recommended bias. As relative sensitivity values they refer to the corresponding values of the relevant IEC reference tape at its own reference bias corresponding to the definition in Ref. 1.4.

2.3 BN (Bias Noise level): The index ...IEC refers to measurement using the weighting A-filter specified in IEC Publication 651, while ...CCIR refers to the use of the weighting filter and quasi peak meter specified in CCIR 468-3.

2.4 MOL/BN (Dynamic range): The signal to bias noise level ratio MOL/BN results from the difference of the maximum output level MOL and the bias noise level BN. Regarding the index IEC or CCIR respectively see Ref. 2.3.

2.5 P (Print-through): Print-through is the ratio of a reference level recording to the highest signal level transferred to the next tape layer after 24 hours storage at 20°C (68°F).

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3 The magnetic measurements are made by means of a magnetic field having a strength of 100 kA/m (1,250 Oe) in order to obtain
a practically saturated magnetisation in the magnetic material of the sample.
3.1 H_C (Coercivity): The coercitive magnetic field strength is required to reduce the longitudinal magnetisation in the magnetic material to zero after the sample has been magnetised to saturation.
3.2 B_{RS} (Retentivity): Retentivity is the remaining magnetic flux density in the magnetic material when the magnetising field is reduced to zero after the sample has been magnetised to saturation.
3.3 $Ø_{RS}$ (Remanent, or residual saturation flux): the so-called "residual saturation flux" is the retentivity multiplied by the thickness of the magnetic coating.
4.1 Tape width and its tolerances correspond to the specifications given in IEC Publication 94-4.
4.2 Thicknesses: Values given are mean averages.
4.3 Yield strength (F3) and breaking tensile strength: According to the methods specified in IEC publication 94-4 the force necessary to produce 3% elongation, or to break the tape using a test sample length of 200 mm and an elongation rate of 100 mm/min. The value given in MPa results from the measured strength related to the cross section of the tape sample. The strengths increase a little less than proportionally with tape width.

All data given in the specification are subject to change without prior notice due to technical progress.

7. Ordering Information

RMGI Product Code	Tape Width		Tape Length		Reel Diameter		Reel Type / Pancake	Hub Type	Box Type	Tapes / Carton
	Inch	mm	ft	m	Inch	m				pcs
SM 900										
34620	0,25	6,3	2.500	762	10,5	265	Metal Reel	NAB	Hinged	10
34720	0,5	12,7	2.500	762	10,5	265	Metal Reel	NAB	Hinged	6
34730	0,5	12,7	2.500	762			Pancake	NAB	Hinged	6
34820	1	25,4	2.500	762	10,5	265	Prec. Reel	NAB	Hinged	4
34920	2	50,8	2.500	762	10,5	265	Prec. Reel	NAB	Hinged	2
34921	2	50,8	5.000	1.524	14	360	Prec. Reel	NAB	Hinged	2

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