

PM5672

TV modulator, DS

PM5672 is a Vestigial Side-Band modulator/Stereo sound modulator with output signals in the range of 45-890MHz (BANDS 1-5). Mono, Stereo or Dual mode is selected by front panel switches or remote control. It is intended for use in CATV and TV-set manufacturing installations where both reliability and high-performance are required. It is fitted with two meters to indicate the depth of Vision modulation and the amount of frequency deviation in the sound channel. The basic version of the modulator has group-delay pre-correction, VSB filter at I.F., crystal-controlled internal reference oscillator, and RF output on a single channel. The output signals have high spectral purity and low radiation into the adjacent channels. In applications requiring extreme frequency stability, a Temperature Compensated X-tal Oscillator (TCXO)* may be installed for internal frequency control. Provision is also made for the use of an external frequency reference of 5MHz or 10MHz if so desired.

* PM 8524 = 10MHz TCXO

Accuracy: 2×10^{-6} absolute

1×10^{-6} ageing

Technical data

This instrument has been designed and tested in accordance with Safety Class I requirement of IEC Publication 348 (Safety Requirements for Electronic Measuring Apparatus), and has been supplied in a safe condition. This manual contains information and warnings which must be followed to ensure safe operation and to retain the instrument in a safe condition.

Performance characteristics

Properties expressed in numerical values with stated tolerances are guaranteed by the PHILIPS organisation in your country. Specified non-tolerance numerical values indicate those that could be nominally expected from the mean values of a range of identical instruments.

A. Initial characteristics

- Cabinet type : 2U high, 19 inch rackmount/table top cabinet
- Maximum dimensions
 - Height : 88mm (3.45") excl. feet
 - Width : 440mm (17.30")
 - Depth : 430mm (17.00") } excl. handles
- Maximum weight (Mass) : 8kg (17.5 lbs)

Environmental conditions

The environmental data mentioned in this instruction manual is based on the results of the manufacturer's checking procedures.

Details of these procedures and failure criteria are supplied on request by the PHILIPS organisation in your country, or by PHILIPS, INDUSTRIAL & ELECTRO-ACOUSTIC SYSTEMS DIVISION, EINDHOVEN, THE NETHERLANDS.

B. Climatic conditions

- Ambient temperature
 - Rated range of use : +5°C to +45°C (+40°F to +113°F)
 - Limited range for storage and transportation : -30°C to +70°C (-22°F to +158°F)

C. Mechanical requirements

- Vibration

Limit range for storage : 30 min. in each : According to IEC-Publ. 68,
and transportation of three directions, test Fc.
10 to 150Hz; 0.7mm
P-P and 50m/s² max. Note: Unit mounted on vibration
acceleration. table without shock absorbing
material.

- Bump

Limit range for storage : 1000 bumps of 100m/s² : According to IEC-Publ. 68,
and transportation 1/2 sine, 6ms duration test Eb.
in each of 3 directions.

- Packing

: Acc. to UN-D-1400. : The test methods mentioned in
the N.V. Philips Standard
UN-D-1400 are in accordance with
those of the relevant ISO-Standards.

D. Mains supply conditions

Mains supply voltage : 100,120,220, or 240V AC,
+10%, -15%.

Mains supply frequency : 48-65Hz

Power consumption : 25W : at nominal mains voltage.

E. General internal operating conditions

Versions	Vision IF frequency	Sound IF frequency 1	Sound IF frequency 2
B/G	38.9MHz	33.4MHz	33.1578125MHz
D/K	38.9MHz	32.4MHz	32.1578125MHz
M	45.75MHz	41.25MHz	41.0078125MHz
M	38.9MHz	34.4MHz	34.1578125MHz
I	38.9MHz	32.9MHz	

F. Vision section

Video input level	:	1Vpp \pm 3dB. (adjustable)	
Input impedance	:	75ohm, looped through 2xBNC connectors	
Return loss	:	34dB 0-7MHz, 75ohm looped-through	
Modulation	:	Negative AM, the instrument is delivered with clamping to back porch of the sync pulse. It is possible to change to sync peak clamping by an internal change.	
Amplitude response	:	See figure 3-1, 3-3, 3-5, 3-7.	
Group-delay response of demodulated video	:	See figure 3-2, 3-4, 3-6, 3-8.	
Nominal Vision/Sound ratio	:	13dB/20dB, Sound I, Sound II resp.	
Vision IF Carrier frequency	:	38.9MHz.	
Tilt, 50Hz/60Hz Square Wave	:	<2.0%	} : Demodulated with PM 5560
Tilt, 15kHz Square Wave	:	<2.0%	
12.5T/20T Gain inequality	:	<5.0%	
12.5T/20T Delay inequality	:	<20ns.	
Bar overshoot/undershoot	:	<5.0%	
2T pulse & bar	:	<5.0% difference	
Differential Gain *)	:	<4%	: Measured with a 5-riser staircase with superimposed 280mV (40IRE) subcarrier (Test signal D2).
Differential Phase *)	:	<2°	: As above.
Static non-linearity *)	:	<5.0%	: Measured with a 5-riser staircase (Test signal D1).
Chrominance/Luminance intermodulation *)	:	<3.0%	: Measured with a superimposed chrominance bar signal (Test signal G1) or a three-level chrominance signal (Test signal G2).
Signal to noise ratio	:	>-55dB	: RMS unweighted relative to Black/White.
Periodic disturbance	:	<-55dB	: Peak-to-Peak. Relative to Black/White.

*) measured in accordance with CCIR recommendation 567-1.

G. Sound section

Modulation	: FM
Pre-emphasis	: 50us (75us in system M)
Sound input level	: 0dBm/775mV
Sound input impedance	: 600ohm, balanced. 2xDin 5-pole connector

Contribution of the instrument in a complete system. Measured with pre-emphasis off, with a black video signal and with a deviation of 50kHz (25kHz, M-version). For S/N and crosstalk measurements a weighting filter according to CCIR rec. 468-3 has been used:

S/N of demodulated LF	: >60dB with split carrier detector.
Amplitude response	: 30-15000Hz <±1dB
Distortion of demodulated LF	: <1% within 30-15000Hz.
Crosstalk attenuation, stereo mode	: >55dB at 1kHz >45dB at 12.5kHz
Crosstalk attenuation, dual mode	: >75dB at 1kHz >65dB at 12.5kHz
Sound oscillator frequencies	: See general internal operating conditions (item E).
Sound carrier output level	: -7 to -20dB (relative to peak sync level)

Identification:

Amplitude modulation of pilot signal	: 30-100% (nom. 50%)
Frequency deviation of the Sound 2 FM oscillator modulated with unmodulated pilot signal	: ±2.5kHz ±0.5kHz nominal
Stereo Sound identification	: $f_H/133 = 117.5\text{Hz}$ phase locked to f_H
Dual Sound identification	: $f_H/57 = 274.1\text{Hz}$ phase locked to f_H

H. Internal reference

Crystal oscillator	: 5MHz ±100ppm.
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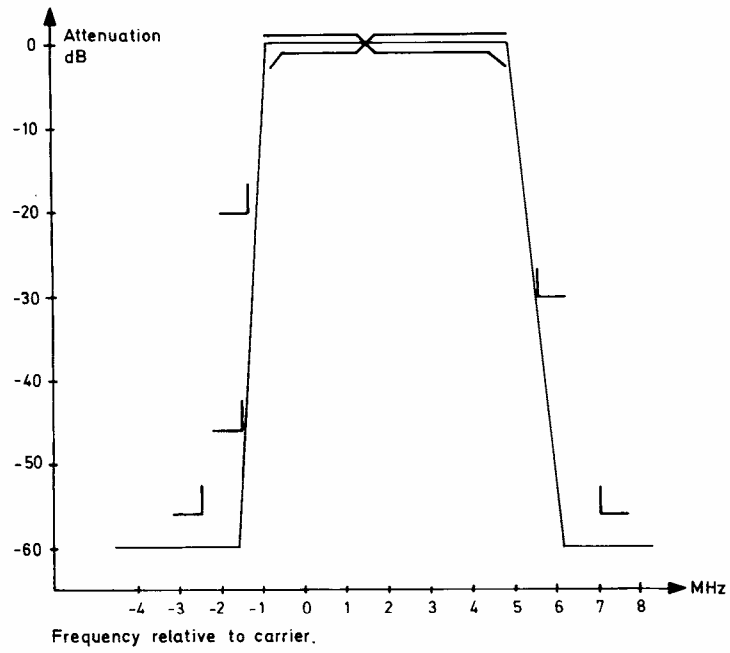
I. External reference input

Frequency	: 5MHz or 10MHz
Input level	: 100-300mV/rms
Input impedance	: 50ohm, BNC-connector

J. Output (converter section)

Frequency range	: 45-890MHz
Output level	: Max. 200mV/rms (peak sync level) Min. 40mV/rms
Output impedance	: 75ohm
V.S.W.R.	: <2; 45MHz to 890MHz for 7MHz bandwidth
Unwanted Outputs *)	: <-66dB for $f < 300\text{MHz}$ and <-60dB for $300\text{MHz} < f < 1000\text{MHz}$ (Measured with -13/-20dB Sound relative to peak sync level)
Radiation in lower adjacent channel	: 50dB below peak sync level

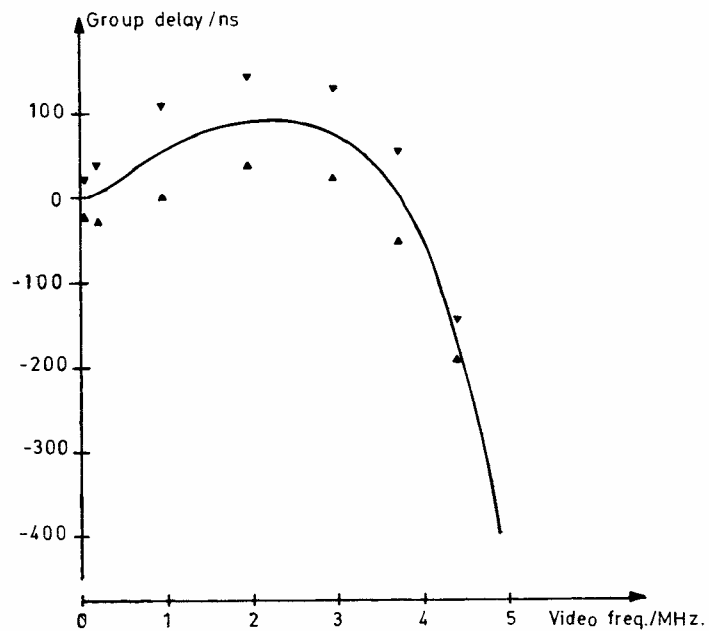
*) Harmonics, Spurious Radiation and Intermodulation products.



Frequency/MHz	<-2.5	-2.5	-1.5	-1.25	-0.75	-0.5	+1.5	+4.5	+4.8	+5.5	+7	>+7
Attenuation/dB	-60	<-56	<-46	<-20	0 ⁺¹ ₋₄	0 ⁺¹ ₋₁	0	0 ⁺¹ ₋₁	0 ⁺¹ ₋₄	<-30	<-56	-60

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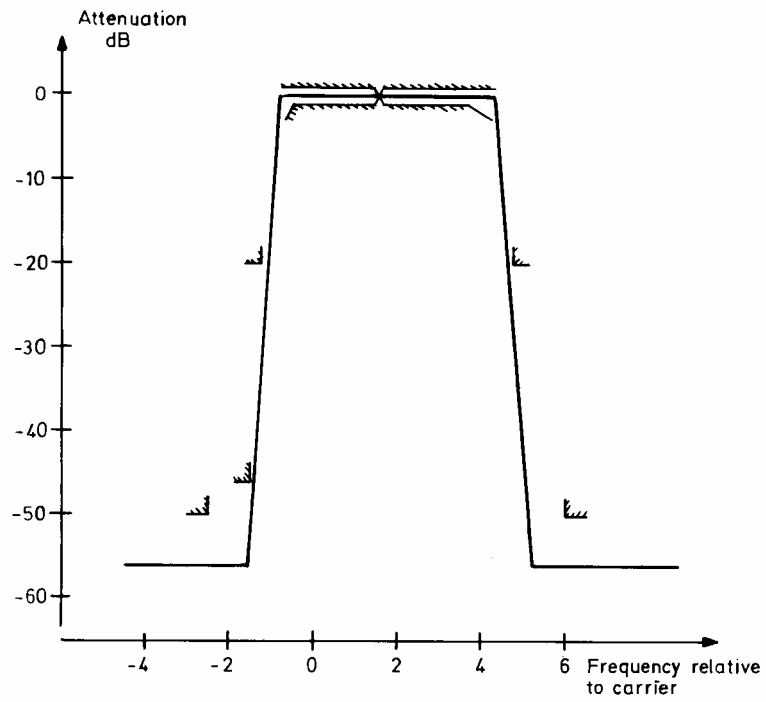
Fig. 3-1 Amplitude characteristic, system "B/G"



Video frequency/MHz	0.1	0.25	1	2	3	3.75	4.43	4.8
Group delay/ ns	0 [±] 20	5 [±] 30	53 [±] 50	90 [±] 50	75 [±] 50	0 [±] 50	-170 [±] 20	-400

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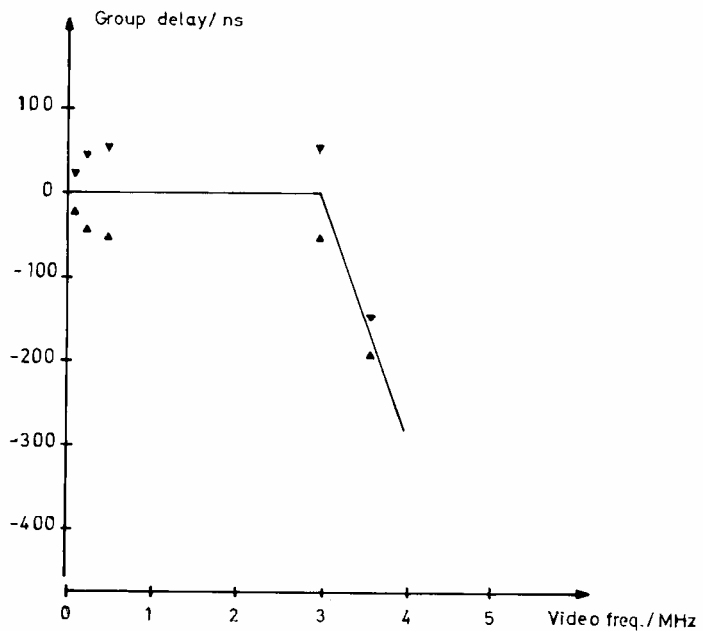
Fig. 3-2 Group-delay, precorrection, system "B/G"



Frequency /MHz	<math>< -2.5</math>	-2.5	1.5	1.25	0.75	-0.5	1.5	3.6	4.2	4.75	6	> 6
Attenuation /dB	-56	<math>< -50</math>	<math>< -46</math>	<math>< -20</math>	$+1$	$+1$	0	$+1$	$+1$	<math>< -20</math>	<math>< -50</math>	-56
					-4	-1		-1	-3			

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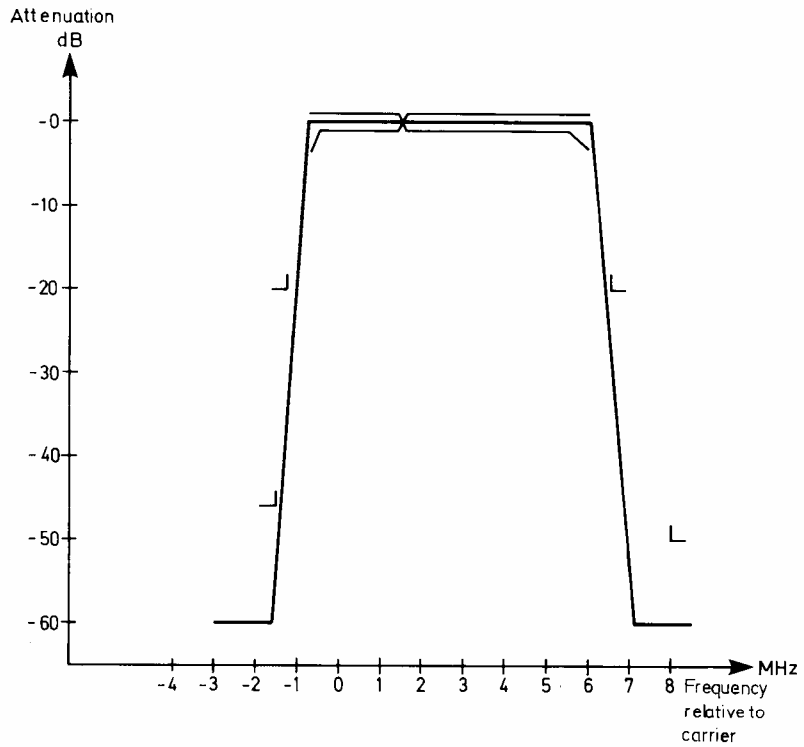
Fig. 3-3 Amplitude characteristics, system "M"



frequency /MHz	0.1	0.25	0.5	3	3.58
Group delay/ns	0 ± 20	0 ± 40	0 ± 50	0 ± 50	170 ± 20

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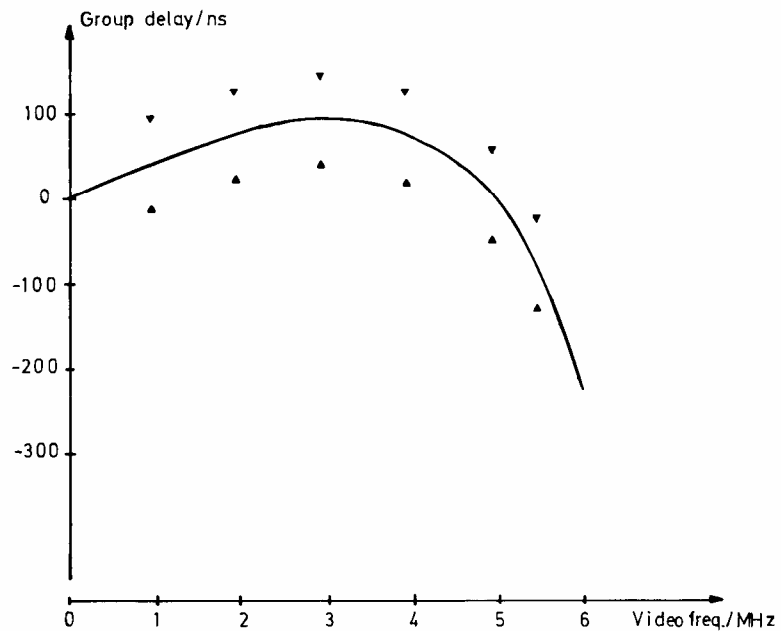
Fig. 3-4 Group-delay, precorrection, system "M"



Frequency/MHz	<-1.5	-1.5	-1.25	-0.75	-0.5	1.5	5.5	6	6.5	8	>8
Attenuation/dB	-60	<-46	<-20	$0 \pm \frac{1}{4}$	0 ± 1	0	0 ± 1	$0 \pm \frac{1}{3}$	<-20	<-50	-60

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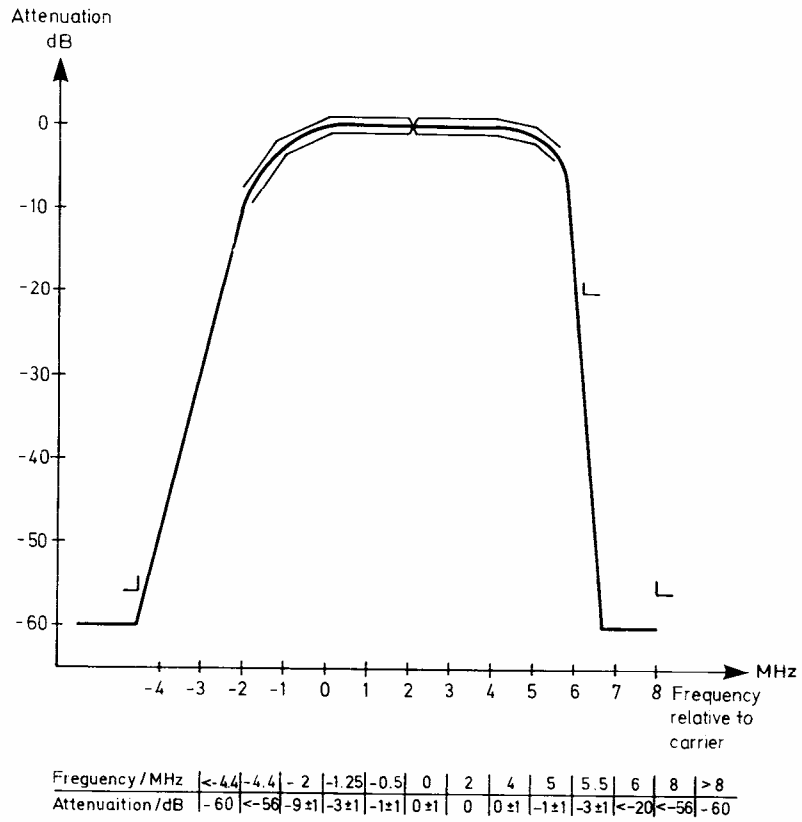
Fig. 3-5 Amplitude characteristics, system "D/K"



Frequency / MHz	0	1	2	3	4	5	5.5	6
Group delay/ns	0	40 ± 50	75 ± 50	90 ± 50	70 ± 50	0 ± 50	80 ± 50	-225

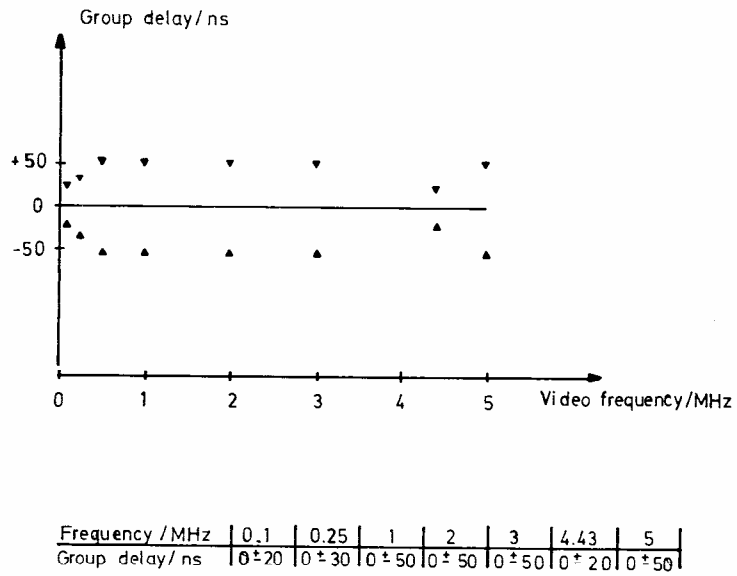
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Fig. 3-6 Group-delay, precorrection, system "D/K"



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Fig. 3-7 Amplitude characteristics, system "I"



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Fig. 3-8 Group-delay, precorrection, system "I"