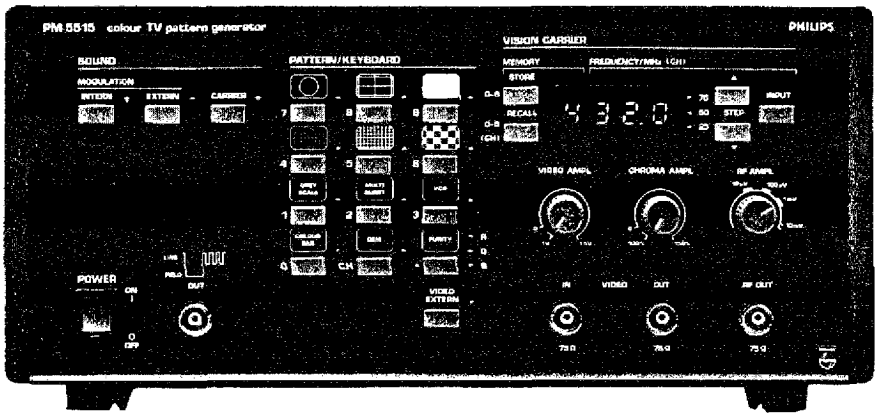
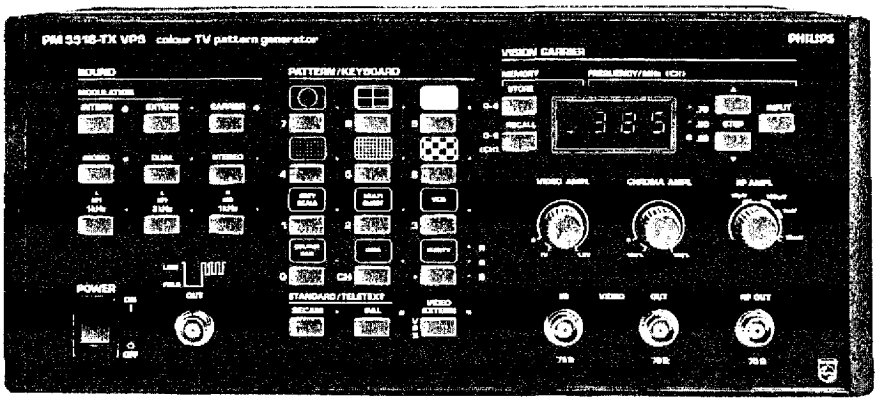
TV & Video Pattern Generators

PM 5515 & PM 5518

GPIB IEEE-488



PM 5515



PM 5518 TXI
IEEE-488 Version

PM 5515 & PM 5518 Color TV Pattern Generator Family

- Keyboard call-up of up to 70 test patterns/combinations
- Simple TV standard selection of PAL, NTSC or SECAM
- Synthesized control of RF frequency
- Covering every RF band from IF to bands IV/V including cable TV bands
- Storage and recall of 10 complete programs, RF freq, pattern and sound settings
- Operation of up to 3 to 4 receivers on a 10 mV output
- RGB + Y/C (option for S-VHS compatibility)
- GPIB/IEEE-488 version with standard RGB and universal chroma

Philips' PM 5515 & PM 5518 offer today's most complete range of color pattern generator performance. With a choice of powerful yet easy-to-use instruments that speed and simplify every aspect of video testing and troubleshooting. Providing a complete and economic solution for every testing requirement: color TV, closed circuit TV systems, video recorders, and video display monitors.

Multi-Standard Coverage

Philips' pattern generators cover all of the world's major TV standards – NTSC/PAL/SECAM on the powerful PM 5518, and NTSC/PAL on the PM 5515 – with simple switch selection at the rear panel to ensure compatibility with your system of choice. (An additional model PM 5516 is also available for SECAM-only compatibility.)

Each model is also available in a variety of optional configurations, ensuring optimum economy in meeting specific requirements. Choices include an RGB option for servicing color TV monitors and applications involving computer graphics, Y/C output for S-VHS, GPIB/IEEE-488* for system use, and a variety of PAL teletext and stereo options.

Versatility With Ease

The PM 5515 and PM 5518 series offer you unparallelled versatility and ease-of-use.

Thanks to microcomputer control, one simply keys-in the programs required – RF frequency setting, pattern selection and sound modulation. Touch a button to store them – ready for recall. And, even a year later, just recall and the program is still there – ready for immediate use. Versatility plus simplicity.

Lowest Cost of Ownership

Microprocessor control offers more than versatility with ease. It offers security and reliability. Software modules and solid-state memories take over from mechanical switches, reducing service and maintenance costs to the absolute minimum. And with Philips built-in quality and reliability the user enjoys a sound guarantee of low cost of ownership.

**The terms GPIB and IEEE-488 may be used interchangeably throughout this catalog.*

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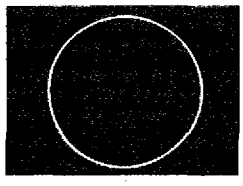
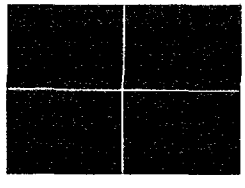
PM 5515 & PM 5518

Patterns for Now and for the Future

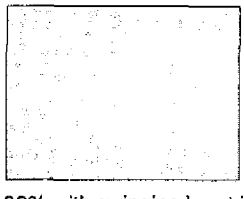
Twelve pushbuttons make the selection of eighteen different basic patterns possible. These test patterns check and align the monochrome and chrominance circuitry of the color TV monitors and VCR. They can also be combined in over 70 patterns for special requirements.



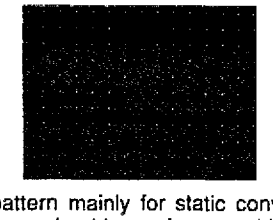
Circle on a grey background for checking the overall linearity and geometry. The white circle changes automatically to black when used with the white pattern and is useful for checking reflections.



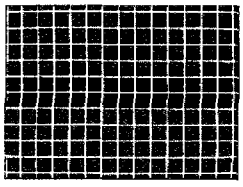
Center Cross/Border Lines is ideal for centering TV monitors and TV screens. Also to check the deflection linearity and for pin-cushion correction.



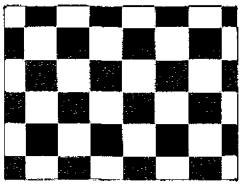
White 100% with swinging burst is designed for setting white D and for an overall check of purity. Also for beam current adjustment. White D is the correct white necessary for a natural color reproduction.



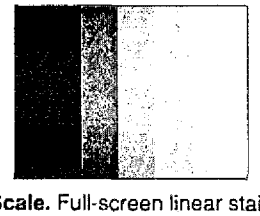
Dot pattern mainly for static convergence. The screen should contain pure white dots.



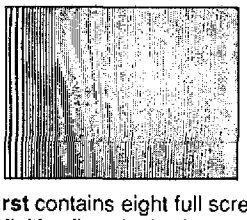
Cross Hatch/Center Indication with 17 vertical and 12 horizontal lines is used for checking and realigning dynamic and corner convergence. The advantage is that there is no interlacing which would normally tire the eyes. If interlacing is required this can be achieved by superimposing another pattern such as center cross or circle.



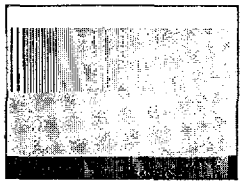
Checkerboard Pattern of six times eight rows of squares provides a visual standard for basic picture tube alignments, for example: centering, focus, horizontal and vertical deflection and linearity.



Grey Scale. Full-screen linear staircase signal with 8 equal steps from black to white is used to locate faulty linearity of the video amplifier or grey scale setting.



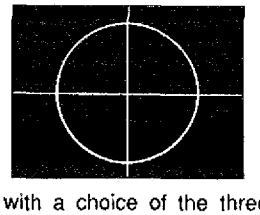
Multiburst contains eight full screen vertical bars of definition lines in the frequency ranges 0.8, 1.8, 2.8, 3.0, 3.2, 3.4, 3.8 and 4.8 MHz. This checks the bandwidth of the video or luminance amplifier in black and white or color TV as well as the resolution of monitors and video recorders.



VCR is a specially-designed test pattern to check the bandwidth, linearity, sensitivity and AGC of the chroma amplifiers in color video recorders.

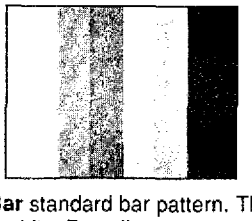
This combined test pattern is divided into 4 horizontal segments:

- 24 lines of 100% white to clip and to level.
- Eight bars of resolution of which 2.8 - 3.0 - 3.2 - 3.4 MHz are used to align the high-pass filter for a maximum resolution in VCR bandwidth.
- Eight steps of decreasing linear levels of saturation from 100% to 0% to check the chroma amplifier linearity and color AGC circuitry.
- A black horizontal bar with a moving white field to check moving pictures on video recorders.



Purity with a choice of the three primary colors clearly indicated by LEDs. The red pattern is used for checking color purity. The green pattern provides a purity check for three-in-line tubes. Blue is also available to check color performance. The three complementary colors, magenta, yellow and cyan can also be displayed by selection, as can white and black.

Combinations with circle and/or center cross are easy to select.

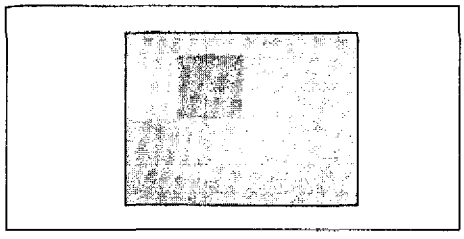


Color Bar standard bar pattern. The vertical bars are white D, yellow, cyan, green, magenta, red, blue and black.

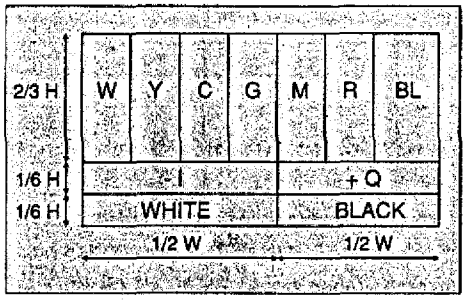
Since it is dependent on the TV system selected, the luminance content is automatically corrected for each setting.

The color bar pattern therefore provides sufficient information for a good overall check of color performance, including checks on burst keying, subcarrier regeneration, RGB amplifiers, the delay color versus B/W signal and saturation.

PM 5515 & PM 5518

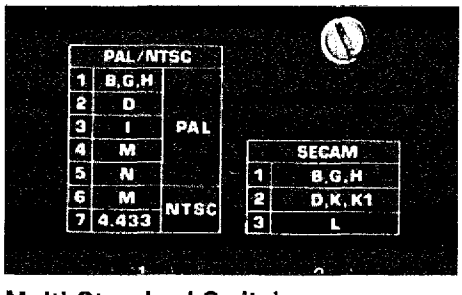


Examples of PAL coded DEM pattern. For NTSC this DEM pattern contains different color coding.



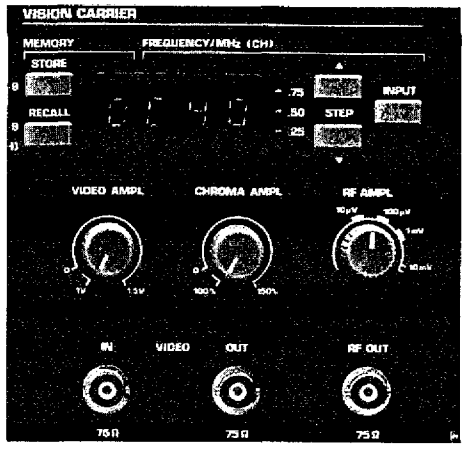
DEM Pattern. Demodulator is a combined test pattern which, divided in 3 sections, contains information to make on-screen checks and alignments of the color demodulators and subcarrier frequency. This test pattern contains information similar to the EIA split field color bar, certaining split field color bar, - I, + Q signals and white and black information.

The screen shown is an example of a NTSC coded DEM pattern. For PAL this DEM pattern contains different color codings.



Multi-Standard Switch

On the rear panel of the TV color pattern generators is a switch for direct selection of the required TV and chroma system using a simple thumbwheel setting. Line frequency is automatically selected using internal crystal; either 15,625 Hz for CCIR or 15,734 Hz for RTMA with a frequency tolerance of less than 0.4 Hz. The required sound and vision carrier separation and chroma subcarrier are selected simultaneously.



RF Selection

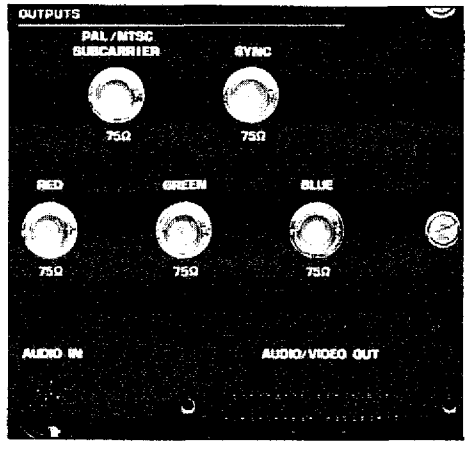
All models cover the full frequency range from 32 MHz to 900 MHz, including IF and TV transmissions in frequency bands I, III, IV and V. Full coverage of cable TV and S-channels is provided in frequency bands 104 MHz to 175 MHz (S1 to S10) and 230 MHz to 300 MHz (S11 to S20); and hyperband coverage is provided in the frequency range 300 MHz to 470 MHz. Selection of the synthesized RF frequency within these bands is electronic, via the keyboard.

The first digit shows the memory place. The other three digits indicate the selected frequency or TV channel. The RF carrier output of >10 mV into 75Ω is ample for 3 or 4 receivers in parallel during workshop repairs, and the carrier can be continuously attenuated by more than 60 dB, with output indications at 1 mV, 100 µV and 10 µV levels. The ability to smoothly vary the RF level is of particular value when checking the overall RF sensitivity or AGC circuits.

Up to ten memory places can be used either to store the selected RF frequency or TV channel number. Having stored, e.g. the local TV stations, any one of them can be recalled at the touch of a button without time-consuming dial tuning.

RF Carrier and Frequency Spectrum

Although double sideband, the RF envelope of the PM 5515/18 is very similar to that transmitted by professional TV broadcast companies, such as, e.g., 13 dB for TV standard G between the sound and vision channels. (Most other generators have 25 dB or more separation, leading to false impressions when aligning tuners and RF amplifiers.)



The Euro/SCART connector for audio/video out as well as the DIN connector for external audio modulation are standard for all models.

Outputs and Y/C plus RGB

On the rear panel, video output is via a Euro/Scart connector and external sound modulation via a standard DIN plug. Color subcarrier and input sync signal are supplied as standard, with Y/C plus RGB optionally available (PM 9553).

RGB signals and a SYNC and subcarrier facility are available to meet the rapid advance in computer graphics techniques and servicing of color video monitors. There are many monitors which only accept RGB signals and for testing these the RGB option is essential.

Included with the RGB option, the Y/C module gives the separate luminance and chroma (Y/C) outputs needed by the new generation S-VHS video recorders and Y/C monitors. By separately recording the Y and C signals, these VCRs eliminate cross-color effects to give dramatically improved color reproduction.

IEEE-488 Version

For use in systems applications, the PM 5518TXI model is configured with an IEEE/IEC interface. All the available TV and sound modulation standards can be selected remotely, and "bus learn mode" and "identification mode" are included.

Added Functionality for PAL Standards

For applications requiring added compatibility with European TV functions, a wide variety of optional configurations are available for selected PAL systems. These include stereo, second sound channel, teletext and VPS.

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Optional Configuration Compatibility Table

Basic Configuration**	TV System												Y/C +RGB	IEEE-488
	NTSC	PAL					SECAM							
	M	D	B, G, H	I	M	N	L	B	D	G	H	K1		
PM 5515MM	a	a	a	a	a, opt*	a, opt*	not avail	not avail	not avail	not avail	not avail	not avail	opt	not avail
PM 5515GX	a	a	a, b	a	a, opt*	a, opt*	not avail	not avail	not avail	not avail	not avail	not avail	opt	not avail
PM 5515GT	a	a	a, c	a, c	a, opt*	a, opt*	not avail	not avail	not avail	not avail	not avail	not avail	opt	not avail
PM 5515GTX	a	a	a, b, c	a	a, opt*	a, opt*	not avail	not avail	not avail	not avail	not avail	not avail	opt	not avail
PM 5515TXS	a	a	a, b c, d	a	a, opt*	a, opt*	not avail	not avail	not avail	not avail	not avail	not avail	opt	not avail
PM 5518	a	a	a	a	a, opt*	a, opt*	a	a	a	a	a	a	opt	not avail
PM 5518TX	a	a	a, b, c	a, c	a, opt*	a, opt*	a, e	a	a	a	a	a	opt	not avail
PM 5518TXS	a	a	a, b c, d	a, c	a, opt*	a, opt*	a, e	a	a	a	a	a	opt	not avail
PM 5518TXI	a	a	a, b, c d, opt	a, c	a	a	a, e	a	a	a	a	a	opt	std

a. Mono sound
b. FM stereo and dual sound
c. Teletext, 5 pages plus wallpaper test patterns
d. VPS
e. Antiope-teletext

**Via PM 9546 option*
***Compatible with all broadcast standards listed, unless noted*

Specifications

Technical Specifications

Video Carrier

Frequency
Range: 32 MHz to 900 MHz
IF + Band I: 32 MHz to 90 MHz
S-Band S1-S10: 104 MHz to 174 MHz
Band III: 174 MHz to 230 MHz
S-Band S11-S20: 230 MHz to 300 MHz
Hyperband H21-H40: 300 MHz to 470 MHz
Band IV-V: 470 MHz to 900 MHz
Frequency Selection: Keyboard
Fine Tuning: 250 kHz steps for TV frequencies 100 kHz steps for IF frequencies (32 MHz to 44.9 MHz)
Frequency Tuning: In positive or negative direction; tuning speed increase by holding step button
Storage: a) Possibility for 10 different RF frequencies; b) As a), indicated as TV channel numbers
Indication: 4-digit 7-segment LED display. a) First digit: memory, store and recall position 0 to 9; b) 2nd, 3rd and 4th digits: 3-digit indication of frequency in MHz. Separate indication for 250 kHz, 500 kHz and 750 kHz steps; c) Keyboard-selectable TV channel numbers (e.g. C21 or C70).

RF Output

RF Output: BNC connector (front panel)
Impedance: 75Ω
Output Voltage: <10 mV
Attenuation: 60 dB, continuous

Video

Modulation: AM internal/external switchable
Polarity: Negative/positive for SECAM L

Input
Video Input: BNC connector (front panel)
Input Voltage (P-P): 1V
Maximum Permissible Input Voltage: ±5V
Impedance: 75Ω
Polarity: White level positive
Coupling: DC (clamping on sync)

Output
Video Output: a) BNC connector; b) SCART connector (Euro-AV connector), pin 19 (rear)
Impedance: 75Ω
Voltage (P-P): a) 1V fixed; b) variable between 0 to 1.5V/75Ω
Polarity: Negative
Coupling: DC

Chroma (PAL and NTSC)

Chroma Standards: PAL according to system B, D, G, H, I, (M, N), NTSC according to system M (switchable)
Selection: Rear panel thumbwheel system switch
Subcarrier Frequency: 4.433619 MHz for PAL B, D, G, H, I; 3.575611 MHz for PAL M; 3.582056 MHz for PAL N; 3.579545 MHz for NTSC; subcarrier frequencies coupled to line frequency according to selected standard
Tolerance: ≤3 x 10^{-5} (+5°C to +40°C)
Burst: Position, number of cycles and phase according to selected standard
Amplitude: Chroma with burst, a) fixed (100%); b) continuously variable from 0% to 150%
Chroma Vectors Inaccuracy: Phase ≤3°, amplitude ≤5% relative to luminance amplitude

Chroma (PAL/NTSC; PM 5518TXI)

Chroma Standards: As PM 5518TXS with PAL M, N as standard
Subcarrier Frequency (coupled with line frequency): PAL B, D, G, H, I, 4.433619 MHz; PAL M, 3.575611 MHz; PAL N, 3.582056 MHz
Tolerance: 10^{-6}
Temperature Coefficient: 2 x 10^{-6}/K
Aging: 2 x 10^{-6}/year
Subcarrier Frequency (not coupled with line frequency): NTSC (4.433 MHz) 4.433619 MHz
Tolerance: <10^{-4} at 23°C
Aging: 2 x 10^{-6}/K
Subcarrier Blanking: Acc to system

Chroma (SECAM)

Chroma Standards: SECAM B, G, H, D, K, K1 and L
Selection: Two rear panel thumbwheel system switches
Sound Carrier Rel to Vision Carrier (Hz): B, G, H-5,500,000; D, K, K1, L-6,500,000
Type/Polarity of Video Modulation: 3 AF/neg
Type of Sound Modulation: FM
Chrominance Subcarrier (Hz): FOB = 4,250,000 FOR = 4,406,250
Tolerance: <2 kHz
Type of Chrominance Subcarrier Modulation: Frequency modulation
Transmitted Chrominance Information: Line-sequential D'R and D'B
Line Frequency: 15,625 lines/s
Field Frequency: 50 Hz (50 fields/s)
Signals: D'R = -1.9 (E'R - E'Y); D'B = 1.5 (E'B - E'Y)
Identification: According to TV system in line and frame
Frame Identification: Position in lines 7 to 15; in 1st, 3rd and 5th field, etc: in lines 320 to 328; in 2nd, 4th and 6th field, etc
Line Identification: By burst (chrominance subcarrier reference signal) on the back porch according to TV standard (B, D, G, H, K, K1, L/SECAM)

Amplitude: Line and frame identification according to TV standard, but also variablebetween 0% to 150% together with chroma information
Chrominance Signal: According to standard, but also variable
Amplitude: Between 0% to 150% of the nominal value
Frequency Deviation: Of chrominance subcarrier according to TV standard
Video Pre-Emphasis: Low frequency pre-correction and high frequency bell filter according to TV standard
Bell Center Frequency: 4.286 MHz
Tolerances: ≤20 kHz

Chroma (SECAM; PM 5518TXI) as above except:

Tolerance: $<10^{-6}$
Temperature Coefficient: 2×10^{-6}/K
Aging: 2×10^{-6}/year

Synchronization

Line Frequency: 15,625 Hz (CCIR), 15,734 Hz (RTMA)
Frequency Tolerance: 0.4 Hz (+5°C to +40°C)
Number of Lines: 625 (CCIR), 525 (RTMA)
Field Frequency: 50 Hz (CCIR), 60 Hz (RTMA)
Line and Frame Sync: According to TV standard, interlacing
Output: BNC connector (front panel)
Sync Signal: Combined signal with line and field synchronization pulses with amplitude difference
Voltage (open circuit): 2.6V for line pulse; 5.0V for field pulse
Impedance: 6 kΩ
Polarity: Negative

Sound Carrier and Modulation

Sound Carrier (mono): On/off switchable
Frequency: 4.5 MHz, standard M, N; 5.5 MHz, standard B, G, H; 6.0 MHz, standard I; 6.5 MHz, standard D, SECAM L
Tolerance: $\leq 3 \times 10^{-5}$ (+5°C to +40°C)
Vision/Sound Carrier Ratio: 13 dB, standard B, G, H; 11 dB, standard D, K, K1, L; 13 dB, standard M, N; 12 dB, standard I
Sound Modulation: FM, internal and external on/off switchable, AM for SECAM L
Pre-Emphasis: 50 µs, standard B, D, G, H, I, K, K1; 75 µs, standard M, N

Internal
Frequency Deviation: ±30 kHz, standard B, G, H; ±15 kHz, standard M, N; ±27.5 kHz, standard I; ±24 kHz, standard D, K, K1
Modulation Depth: 50%, standard SECAM L

External
0.4V will give the same deviation or modulation depth as with internal modulation
Input: DIN connector, pin 3 + 5 (rear panel)
Impedance: 0.5 MΩ
Bandwidth: 40 Hz to 15 kHz
Maximum Input Voltage: ±40V
Output: SCART connector (Euro-AV connector), pin 3 (rear panel)
Impedance: 1 kΩ
Voltage: 0.4V

Teletext for T and TX Versions

Data Synchronization Frequency: PAL BGI-6.9375 MHz, ~$444 \times f^H$; SECAM L-6.203125 MHz, ~$397 \times f^H$
Data Coding: Acc to standards as PAL
Signal Levels: '1' + 66% level, 0+black level; '1' + 100% White level as PAL
Signal Shaping: Cos_2 filter

Text Data
Decoder Alignment: No combination possible with test alignment patterns only PM 5515T and PM 5516T
Data Contents: Clock run-in standard, framing code standard, full field, remaining pattern pseudo-random (not PM 5518)
Normal Working Mode: Combinations possible with all test patterns
Data Lines: 22; 335
Data Contents: ≥5 text pages with special contents for decoder testing for each standard

Signal Output
Teletext Signal Combined with Video Signal: Video output
Modulated RF Signal: RF output, RF from basic unit

Sound Section for Stereo and Second Sound Channel Transmission, For X and TX Versions

Standards: B, G
Sound Carriers: Carrier 1-5.5 MHz; Carrier 2-5.7421875 MHz
Vision Sound Carrier Ratio: Carrier 1-13 dB; Carrier 2-20 dB
Frequency Tolerance: $<3 \times 10^{-5}$ (+5°C to +40°C)

Modulation
FM, internal and external on/off switchable
Pre-Emphasis: 50 µs

Internal Modulation
Sound Channel 1: 1 kHz on/off switchable; 3 kHz on/off switchable
Deviation: ±30 kHz in mono/dual channel; ±15 kHz in stereo, right channel switched off; ±30 kHz in stereo, left and right channels switched on with 1 kHz internal signal
Sound Channel 2: 1 kHz, on/off switchable
Deviation: ±30 kHz

External Modulation
Sound Channels 1 & 2 Input Voltage: 0.4V will give the same deviation as the internal signal

Inputs
DIN connector (rear panel)
Contacts: Pin 2 (ground), pin 3 sound channel 1, pin 5 sound channel 2
Impedance: 0.5 MΩ
Bandwidth: 40 Hz to 15 kHz
Maximum Permissible Voltage: +40V

Outputs
SCART connector (Euro-AV connector)
Contacts: Pin 3 sound channel 1, pin 1 sound channel 2
Impedance: 1 kΩ
Voltage: 0.4V

Operating Mode Detection
Pilot Frequency: 54.6875 kHz ($3.5 \times f_{line}$)
Tolerance: $<3 \times 10^{-5}$ (+5°C to +40°C)
Modulation: AM
Modulation Depth: 50%
Identification Frequencies: 117.5 Hz (f_{line}/133) stereo mode; 274.1 Hz (f_{line}/57) dual channel mode
Deviation of 2nd Sound Carrier: ±2.5 kHz by modulation of carrier with unmodulated pilot; for standards D, I, M, N the stereo versions X and TX also offer all mono facilities

VPS for TXS Versions

VPS Video Programming System for pre-programmed recording with home video recorders according to German broadcasting organizations ARD, ZDF and ZVEI
Data Synchronization Frequency: 5 MHz
Bit Length: 400 ns
Modulation: Bi-phase modulation
Data Coding: According to the guideline issued by ARD, ZDF and ZVEI
Signal Levels: '0' = black level, '1' = 71.4% of white level
Signal Shaping: Cos_2 filter
Location of Data: Line 16
Data Contents: 9 different freely programmable non-volatile sets of VPS data preset at factory; each with 15 words (8 bits), including clock run-in, special identification and date of transmission
Normal Operating Mode: Combination possible with all test patterns and teletext; on/off switchable
Programming: Via keyboard and text strip inserted in the test pattern
Text Strip: 6 different positions, or not visible

IEEE-488 Interface (PM 5518TXI only)

Allows selection and control of all functions

Y/C plus RGB Option (PM 9553)

RGB Outputs: BNC connectors (rear panel)
Output Voltage (P-P): 0.7V/75Ω
Impedance: 75Ω

Subcarrier Output: BNC connector (rear panel)
Output Voltage (P-P): 1V/75Ω
Impedance: 75Ω
Sync Output: BNC connector (rear panel)
Output Voltage (P-P): 2V/75Ω
Impedance: 75Ω

Y/C Outputs

Connector: 4-pin S-connector (rear panel)
Y Signal (luminance): Y signal at pin 3, Y ground at pin 1
Impedance: 75Ω
Nominal Output Level: 1 V_{pp} (into 75Ω)
Tolerance: ±10%

Standard	B, D, G, H, I	M

TV & Video Pattern Generators

PM 5515 & PM 5518

Standard	B, D, G, H, I N, K, K1, L	M
Sync level	-43% ±3%	-40% ±3%
Blanking level	0%	0%
Black level	0%	0%
White level	100%	100%

C Signal (chroma): Complete chroma signal including color burst of CVBS signal. C signal at pin 4; C ground at pin 2.
Impedance: 75Ω
Output Level into 75Ω: Nominal value: 100% ±10% in stop position CHROMA AMPL. Setting *range: 0 to 150% continuously adjustable (not* PM 5514V); 0 to 100% switchable for PM 5514V.

Universal PAL/NTSC Chroma Module
(PM 9546)

PAL Systems: B, D, G, H, I, M, N
NTSC Systems: M
Subcarrier Frequency (coupled with line frequency): PAL B, D, G, H, I, 4.433619 MHz; PAL M, 3.575611 MHz; PAL N, 3.582056 MHz; NTSC, 3.579545 MHz
Subcarrier Frequency (not coupled to line frequency): NTSC (4.433 MHz) - 4.433619 MHz
Tolerance: <100 x 10^{-6} at 23°C
Subcarrier Blanking: According to system

Hyperband Module (PM 9545; only for instruments made before 1987)

Total Frequency Range: *32 MHz to 900 MHz*
IF + Band I: 32 MHz to 104 MHz
S-Band S1 - S10: 104 MHz to 174 MHz
Band III: 174 MHz to 230 MHz
S-Band S11 - S20: 230 MHz to 300 MHz
Hyperband H21 - H40: 300 MHz to 470 MHz
Bands IV-V: 470 MHz to 900 MHz

General Specifications

Power Supply

Voltage: 100V, 120V, 220V, 240V -12% to +10%
Frequency: 50/60 Hz ±5%
Power Consumption: Depends on version

Mechanical Specifications

Size: 300 mm W x 140 mm H x 395 mm L (11.8 in W x 5.5 in H x 15.6 in L)
Weight: Approx 10 kg (22 lb)

Ordering Information

Models

PM 5515MM NTSC/PAL Pattern Generator $2070
PM 5518 NTSC/PAL/SECAML Pattern Generator 2575

Included with Instrument
One-year product warranty, line cord, RF cable, BNC TV connector 758, operating manual, and Certificate of Calibration Practices.

PAL and NTSC TV Systems Specifications For PM 5515 and PM 5518						
Series	**B, G & H**	**D**	**I**	**M**	**N**	**M**
TV and chroma standard	CCIR, PAL	CCIR, PAL	CCIR, PAL	RTMA, NTSC	CCIR, PAL	RTMA, PAL
No. of lines per picture frame	625	625	625	525	625	525
Field frequency (Hz)	50	50	50	60	50	60
Line frequency (lines/second)	15,625	15,625	15,625	15,734	15,625	15,734
Chrominance subcarrier (MHz)	4.433619	4.433619	4.433619	3.579545	3.582056	3.575611
Sound carrier to vision carrier (MHz)	5.5	6.5	6	4.5	4.5	4.5
Sound modulation	FM	FM	FM	FM	FM	FM
Pre-emphasis (µs)	50	50	50	75	75	75

SECAM TV System Specifications For PM 5516 and PM 5518			
TV systems	*SECAM B, G, H*	*SECAM D, K, K1*	*SECAM L*
Sound carrier relative to vision carrier (Hz)	5,500,000	6,500,000	6,500,000
Type and polarity of video modulation	A3F negative	A3F negative	A3F positive
Type of sound modulation	FM	FM	FM
Chrominance subcarrier (Hz)	F_{OB} = 4,250,000 F_{OR} = 4,406,250		
Type of chrominance subcarrier modulation	Frequency modulation		
Transmitted chrominance information	Line sequential D'R and D'B		
Line frequency (lines/second)	15,625		
Field frequency (Hz) (fields/second)	50 (50)		

Optional Configurations*
PM 5515MM+Y/C Standard PM 5515MM plus Y/C and RGB outputs $2625
PM 5515GX Standard PM 5515MM plus PAL G stereo 2575
PM 5515GX+Y/C Same plus Y/C and RGB outputs 3130
PM 5515GT Standard PM 5515MM plus PAL G teletext 2575
PM 5515GT+Y/C Same plus Y/C and RGB outputs 3130
PM 5515GTX Standard PM 5515MM plus PAL G stereo and teletext 2920
PM 5515GTX+Y/C Same plus Y/C and RGB outputs 3495
PM 5515TXS Standard PM 5515MM plus PAL G stereo, teletext, and VPS 3535
PM 5515TXS+YC Same plus Y/C and RGB outputs 4090
PM 5518+Y/C Standard PM 5518 plus Y/C and RGB outputs 3130
PM 5518TX Standard PM 5518 plus PAL G stereo, PAL G/I teletext, and SECAM L antiope 3535
PM 5518TX+Y/C Same plus Y/C and RGB outputs 4090
PM 5518TXS Standard PM 5518 plus PAL G stereo and VPS, PAL G/I teletext, and SECAM L antiope 4140
PM 5518TXS+YC Same plus Y/C and RGB outputs 4695
PM 5518TXI+Y/C Standard PM 5518 plus PAL G stereo, PAL G/I teletext SECAM L antiope, Universal Chroma RGB and IEEE-488 5495

**For PAL M/N, see options below.*

For additional models configured for use outside N. America (including the PM 5516), contact factory.

Options

PM 9544[2,4] VPS Module ..... $ 665
PM 9545[2,3] Hyperband Module 665
PM 9546[1] Universal Chroma Unit, PAL M/N 250
PM 9553[1] Y/C + RGB Output 605

[1] *Retrofit, installed by Fluke/Philips Service*
[2] *For factory installation with new mainframes, or retrofit installed by Fluke/Philips Service*
[3] *Replacement for pre-1987 units only; now standard on all models*
[4] *See VPS for TXS in specs*

Accessories
PM 9075 75Ω BNC-BNC Cable ..... $ 20
PM 9539/01 RF cable and 300Ω TRAFO 30
PM 9561 19-inch Rack Mount Unit 150

Manuals
PM 5515 Operator Card (PN 849646) ... $ 5
PM 5515 Operator (PN 222914) 25
PM 5515 Service Information Operating Card (PN 839407) 5
PM 5515/5518 Service (PN 222963) 40
PM 5518 Operating Card (PN 864801) .. 10
PM 5518 Operator (PN 856117) 55
PM 5518 TXI (PN 896647) 15

**No charge with purchase of unit*

Extended Warranty
SC1-PM 5515 Repair w/Recalibration ... $ 93
SC2-PM 5515 Calibration 120
SC3-PM 5515 Full Service 200
SC1-PM 5518 Repair w/Recalibration ... 158
SC2-PM 5518 Calibration 120
SC3-PM 5518 Full Service 260

Note: The above configurations meet North American power requirements. For other power options, see Section 19.