

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 setting****Keyboard call-up of up to 70 test patterns/combinations****Simple switch selection of PAL, NTSC or SECAM****Operation of up to 3 to 4 receivers on a 10mV output****RGB option****A pattern for the future**

This family of versatile color pattern generators is designed to cover all available TV standards.

- PM 5515 is for PAL/NTSC
- PM 5516 is for SECAM
- PM 5518 is for SECAM/PAL/NTSC

All models are microcomputer-controlled with powerful, non-volatile memories, allowing pre-determined user-programs to be stored and recalled at will. At the touch of a key.

Over 70 different patterns and combinations are achievable, as well as Teletext, FM stereo and dual-channel sound. All very simple to set up.

Each model in the series is available in a basic configuration but with more than one version to cater for the widest possible spectrum of applications. These are listed at the end of this section. For servicing of color TV monitors and applications involving computer graphics, an RGB option is available. Thus all of today's problems are well catered



for with reserve testing capability, ready for tomorrow's.

Versatility with ease

The PM 5515 series offers you unparalleled versatility and unparalleled ease of use!

Thanks to microcomputer control. One simply keys-in the programs required – R.F. 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.

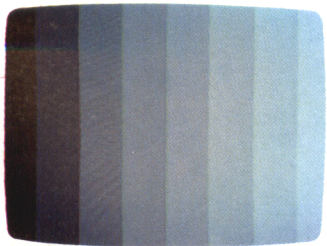
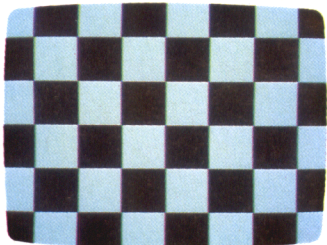
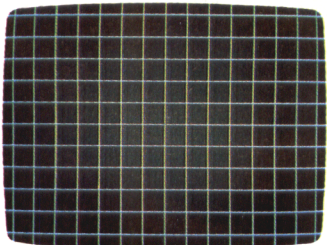
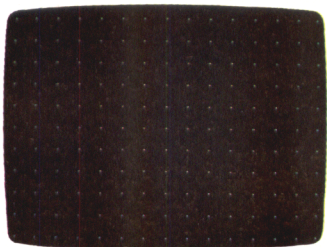
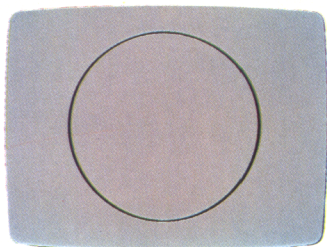
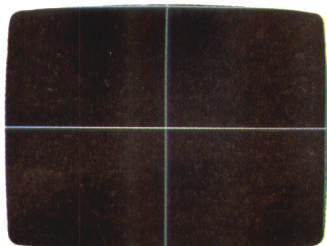
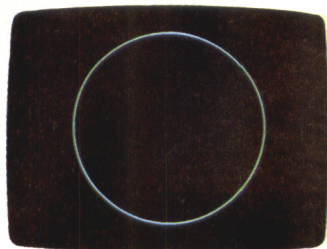
Lowest cost of ownership

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 Europe's soundest guarantee of the lowest cost of ownership.

An unparalleled range

The PM 5515 series offers an unparalleled range of pattern generators. From the versatile basic model with its touch-button control of every parameter, through models offering FM-stereo and dual sound or Teletext test and page signals, up to the model that offers everything! A range from which one can choose a pattern generator for today – knowing that it will meet tomorrow's needs.





Patterns for now and for the future

Twelve push-buttons make the selection of eighteen different patterns possible. These test patterns check and align the monochrome and chrominance circuitry of the color TV monitors and VCR.

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.

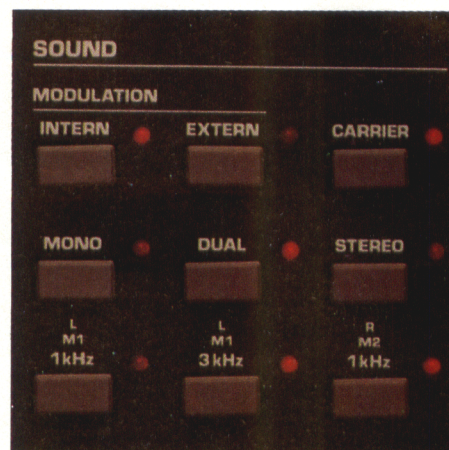
White 100% with swinging burst is designed for setting "white D" and for an overall check of purity. Also for beam current adjustment. White D is the correct white necessary for a natural colour reproduction.

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 re-aligning 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.



Stereo and second sound channel

PM 5515-X and -TX standard CCIR, PAL G, have two sound carriers – for use in one- and two-channel mode, or right and left channel of a stereo signal.

CTV transmission with stereo sound or alternative second sound channel (e.g. to choose between synchronized or original voice tracks) is becoming more regular. The special CTV receivers with stereo decoders needed to reproduce these broadcasts can be expected to be increasingly popular. PM 5515-X and -TX meet the need for a portable color pattern generator for test and re-alignment of these receivers.

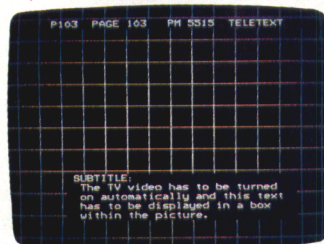
The instrument allows external modulation of a full stereo tuner/amplifier, tape or cassette recorder, with PM 5515 as the RF modulator.

- Sound carriers according to standard at 5.5MHz and 5.742 187 5 MHz $\pm 3 \times 10^{-5}$
- Sound/vision separation at 13 and 20dB, respectively
- Internal FM of 1kHz and 3kHz with 30kHz deviation
- Full external stereo modulation facility for tape and cassette recorders
- Pilot tone according to standard at 54.687 5 kHz $\pm 3 \times 10^{-5}$, with recognition frequencies at $f_H/133 = 117.5\text{Hz}$ (stereo) and $f_H/57 = 274.1\text{Hz}$ (second sound channel)

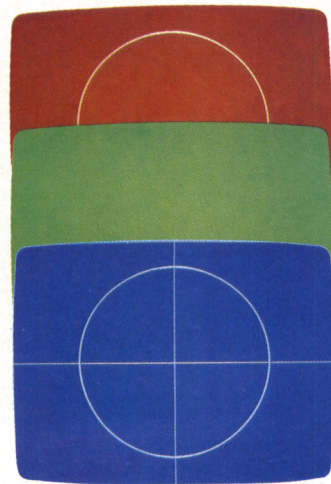


Teletext

The growth of electronic communications has seen a rapid increase in the introduction of text transmission. To meet the highly specialized requirements for the checking and alignment of teletext receivers and decoders the PM 5515-T and -TX have been specially developed. Both instruments offer the facility of a selection of five teletext pages with special contents for decoder testing as well as a wallpaper test pattern.



Examples of teletext pages

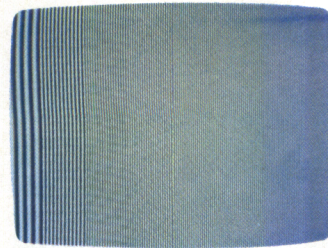


Purity with a choice of the three primary colors clearly indicated by LEDs. The red pattern is used for checking color purity.

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.

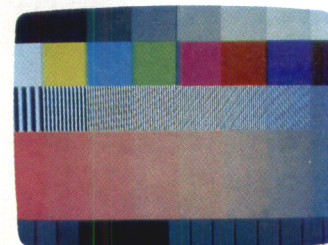
Multiburst contains eight full screen vertical bars of definition lines in the frequency ranges 0.8, 1.8, 2.8, 3.0, 3.2, 3.4, 3.8 and 4.8MHz. This checks the bandwidth of the video or luminance amplifier in black and white or color TV as well as the resolution of monitors and video recorders.



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:

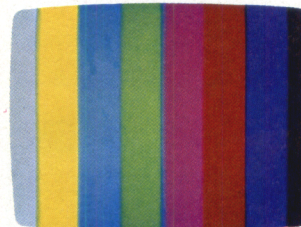
- 24 lines of 100% white to clip and to level.
- Eight bars of resolution of which 2.8–3.0–3.2–3.4MHz are used to align the high-pass filter for a maximum resolution in VCR bandwidth.
- Eight steps of decreasing linear levels of saturation from 100 to 0% to check the chroma amplifier linearity and color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



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.

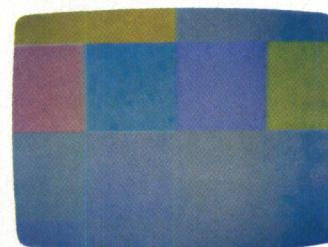
The color bar pattern therefore provides sufficient information for a good overall check of color performance, including checks on burst keying, subcarrier regeneration, RGB amplifiers, the delay color versus B/W signal and saturation.



DEM pattern. Demodulator is a combined test pattern which, divided in 4 sections, contains information to make on-screen checks and alignments of the color demodulators and sub-carrier frequency. For PAL it is used to check the chroma delay line for amplitude and phase (venetian blinds).

G - Y = 0		Y = 50%	
Δ	Δ	\square	\square
+ (R-Y)	- (R-Y)	+ (B-Y)	- (B-Y)
Δ	Δ	\square	\square
+ (R-Y)	- (R-Y)	\pm (B-Y)	\pm (B-Y)
Reference Y = 50%			

Δ (B-Y) = 0 \square (R-Y) = 0



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

A range for today and tomorrow

The versatility of the Philips color pattern generator family not only ensures that today's requirements are expertly met but the developments of tomorrow are anticipated.

PAL/NTSC

The standard PM 5515 generator with its advanced features, unrivalled in the marketplace, is complemented by the three enhanced models 5515-T, 5515-X and 5515-TX.

PM 5515-T has 5 Teletext pages plus a wall-paper test pattern for aligning and testing teletext receivers and decoders.

PM 5515-X features full additional FM stereo and dual sound channel facilities according to system G.

PM 5515-TX offers, in addition to all the facilities of the basic model, all those features provided by the other two models.

SECAM

The PM 5516 SECAM generator operates according to the French SECAM TV system L with positive video modulation and AM sound. It also operates to the TV standards D, K1, B, G and H corresponding to OIRT TV system with negative video modulation and FM sound. The desired TV standard is simply selected at the rear of the instrument.

PM 5516 is the standard SECAM COLOR generator.

PM 5516-T is as PM 5516 but extended with ANTIOPE.

SECAM/PAL/NTSC

PM 5518 SECAM/PAL version offers the choice of operating according to the PAL or SECAM COLOR system.

A push-button on the front panel selects PAL or SECAM. And the rear panel switch selects NTSC.

PM 5518-TX SECAM/PAL pattern generator operates according to TV standard G, STEREO FM, DUAL SOUND and five pages of teletext and – according to system SECAM L – more than four pages of ANTIOPE.

These SECAM and SECAM/PAL versions offer the same wide choice of test patterns, advanced RF selection, STORE/RECALL facilities and, last but not least, RGB option, as the PM 5515 PAL/NTSC generators.

** For Brazil M and Argentine N TV-standards – Crystals are not included but can be ordered separately.*



PM 5515 PAL/NTSC



PM 5515-X PAL/NTSC + stereo



PM 5515-T PAL/NTSC + teletext



PM 5516-T SECAM + antiope



PM 5518-TX PAL/NTSC/SECAM + teletext/antiope + stereo

TECHNICAL SPECIFICATION

VIDEO CARRIER

Frequency	32...300MHz
Range A	470...900MHz
Range B	32...90MHz
Range A covers	IF+TV band I 104...174 MHz
	Band S1/S10 174...230 MHz
	TV band III 230...300 MHz
	Band S11/S20 470...900MHz
Range B covers	TV bands IV-V
Frequency selection	Keyboard
Fine tuning	250kHz steps for TV frequencies
	100kHz steps for IF frequencies (32...44.9MHz)
Frequency tuning	Either in positive or negative direction
	Tuning speed increased by holding the step button
Storage	a) Possibility of 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...9
	b) 2nd, 3rd and 4th digit. Three-digit indication for frequency in MHz. Separate indication for 250kHz, 500kHz and 750kHz steps
	c) via keyboard-selectable TV channel numbers (e.g. C21 or C70)

RF OUTPUT

RF output	BNC connector (front panel)
Impedance	75 Ω
Output voltage	> 10mV
Attenuation	> 60dB, continuous

VIDEO

Video modulation

Modulation	AM internal-external switchable
Polarity	Negative
RF sync level	100%

Video input

Video input	BNC connector (front panel)
Input voltage (p-p)	1V
Max. permissible input voltage	$\pm 5V$
Impedance	75 Ω
Polarity	White level positive
Coupling	DC (clamping on sync)

Video output

Video output	a) BNC connector
	b) SCART connector (Euro-AV-connector), Pin 19 (rear)
Impedance	75 Ω
Voltage (p-p)	a) 1V fixed
	b) Variable between 0...1.5V } into 75 Ω
Polarity	Negative
Coupling	DC

CHROMA (PAL/NTSC)

Chroma standards	PAL and NTSC, selectable at rear, panel PAL according to system B, D, G, H, I, (M, N) NTSC according to system M (switchable)
Subcarrier frequency	4.433 619MHz coupled for PAL B, D, G, H, I with line freq. 3.575 611 MHz according to for PAL M selected for PAL N standard 3.579 545MHz for NTSC
Tolerance	< 3×10^{-5} (+5...+40°C)
Burst	Position, number of cycles and phase according to selected standard
Amplitude	Chroma together with burst a) fixed (100%) b) continuously adjustable from 0-150%
Chroma vectors inaccuracy: phase	$\leq 3^\circ$
amplitude	$\leq 5\%$ relative to luminance amplitude

SOUND CARRIER AND MODULATION

Sound carrier (mono)	on/off switchable
Frequency	4.5MHz, standard M, N 5.5MHz, standard B, G, H 6.0MHz, standard I 6.5MHz, standard D < 3×10^{-5} (+5...+40°C)
Tolerance	13dB, standard B, G, H 11dB, standard D 10dB, standard M, N 7dB, standard I
Vision/sound carrier ratio	FM
Sound modulation	int. on/off switchable ext. on/off switchable
Pre-emphasis	50 μs , standard B, D, G, H, I 75 μs , standard M, N

Internal

Frequency deviation	$\pm 30kHz$, standard B, G, H $\pm 15kHz$, standard M, N $\pm 27kHz$, standard I $\pm 24kHz$, standard D
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External

	0.4V will give the same deviation as with internal modulation
Input	DIN connector Pin 3+5 (rear panel)
Impedance	0.5M Ω
Bandwidth	40Hz...15kHz
Max. input voltage	$\pm 40V$
Output	SCART connector, Euro-AV-connector) Pin 3 (rear panel)
Impedance	1k Ω
Voltage	0.4V

SYNCHRONIZATION

Line frequency	15 625Hz for CCIR 15 734Hz for RTMA
Frequency tolerance	< 0.4Hz (+5...+40°C)
Number of lines	625 for CCIR 525 for RTMA
Field frequency	50Hz for CCIR 60Hz for RTMA
Line + 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)	2.5V for line pulse 5V for field pulse
Impedance	6k Ω
Polarity	Negative

TELETEXT FOR T, IT AND TX VERSIONS

Data synchronization

Frequency	6.9375MHz = 444 x line frequency according to standards
Data coding	According to standards
Signal levels	"0" = black level "1" = 66% white level
Signal shaping	COS ² -filter

Text data

Decoder alignment	No combination possible with test patterns
Data contents	Clock-run-in standard } Full Framing code standard } field Rest pattern pseudo random
Normal working mode	Combinations possible with all test patterns
Data lines	22; 335
Data contents	5 text pages with special contents for decoder testing.

Signal output

Teletext signal combined with video signal	video output	from basic unit
Modul, HF signal	HF output	

FOR X AND TX VERSIONS

SOUND SECTION FOR STEREO AND SECOND SOUND CHANNEL TRANSMISSION

Standards	B, G
Sound carriers	Carrier 1 5.5MHz
	Carrier 2 5.7421875MHz
Vision sound carrier ratio	13dB
Frequency tolerance	20dB < 3×10^{-5} (+5...+40°C)

Modulation

	FM
	internal on/off switchable
	external on/off switchable
	50 μs

Pre-emphasis

Internal modulation

Sound channel 1	1kHz on/off switchable 3kHz on/off switchable $\pm 30kHz$ at stereo, left and right channel switched off $\pm 15kHz$ at stereo, the right channel switched on with 1kHz internal signal
Deviation	$\pm 30kHz$ at stereo, left and right channel switched on with 1kHz internal signal
Sound channel 2	1kHz, on/off switchable
Deviation	$\pm 30kHz$

External modulation

Sound channels 1 and 2 input voltage	0.4V will give the same deviation as with the internal signal
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Inputs

Contacts	DIN connector (rear panel) pin 2 (ground) pin 3 sound channel 1 pin 5 sound channel 2
Impedance	0.5M Ω
Bandwidth	40Hz...15kHz
Max. permissible voltage	$\pm 40V$

Outputs

	SCART connector (Euro-AV-connector) pin 3 sound channel 1 pin 1 sound channel 2
Impedance	1k Ω
Voltage	0.4V

Operation mode detection

Pilot frequency 54.6875 kHz ($83.5 \times f_{line}$)
 Tolerance $< 3 \times 10^{-5}$ ($+5 \dots +40^\circ\text{C}$)
 Modulation AM
 Modulation depth 50%
 Identification frequencies 117.5 Hz ($f_{line}/133$) stereo mode
 274.1 Hz ($f_{line}/57$) two channels mode
 Deviation of second sound carrier ± 2.5 kHz by modulation of carrier with unmodulated pilot
 For standards D, I, M, N the stereo versions X and TX offer all Mono facilities.

POWER SUPPLY

Voltage 110, 127, 220, 240 V
 Tolerance $-12 \dots +10\%$
 Frequency 50/60 Hz
 Tolerance 5%
 Power consumption Depending on version

DIMENSIONS AND WEIGHT

Height 140 mm (5.5-in)
 Width 300 mm (11.8-in)
 Depth 395 mm (15.6-in)
 Weight Depending on version
 approx. 10 kg (22 lb)

ACCESSORIES SUPPLIED

- PM 9538 RF cable
 BNC TV connector 75 Ω
- Operation manual
- Mains cable

OPTION R-G-B

R-G-B outputs BNC connectors (rear)
 Output voltage (p-p) 0.7 V (into 75 Ω)
 Impedance 75 Ω

Subcarrier output BNC connector (rear)
 Output voltage (p-p) 1 V (into 75 Ω)
 Impedance 75 Ω

Sync. output BNC connector (rear)
 Output voltage (p-p) 1 V (into 75 Ω)
 Impedance 75 Ω

ORDERING INFORMATION

For the required type number, please refer to the performance tables below before ordering.

Optional accessories

- PM 9539 RF cable + 300 Ω TRAFO
- PM 9075, 75 Ω BNC-BNC cable
- Service manual

Type number	Stereo	Tele-text	PAL					NTSC M	RGB option
			D	G	I	M*	N*		
PM 5514			X	X	X				
PM 5514-V			X	X	X				<input type="checkbox"/>
PM 5515			X	X	X	X	X	X	<input type="checkbox"/>
PM 5515-X	0		X	0 X	X			X	<input type="checkbox"/>
PM 5515-T		Δ	X	Δ X	Δ X			X	<input type="checkbox"/>
PM 5515-TX	0	Δ	X	0 Δ X	Δ X			X	<input type="checkbox"/>

X = Mono sound 0 = Stereo sound Δ = Teletext ☐ = RGB option

Type Number	Antiope Teletext	PAL					NTSC M	SECAM						RGB option
		D	G	I	M*	N*		L	B	D	G	H	K ₁	
PM 5516								X	X	X	X	X	X	<input type="checkbox"/>
PM 5516-T	■							■ X	X	X	X	X	X	<input type="checkbox"/>
PM 5518		X	X	X			X	X	X	X	X	X	X	<input type="checkbox"/>
PM 5518-TX	Δ ■	X	0 Δ X	Δ X			X	■ X	X	X	X	X	X	<input type="checkbox"/>

X = Mono sound 0 = Stereo sound Δ = Teletext ■ = Antiope ☐ = RGB option