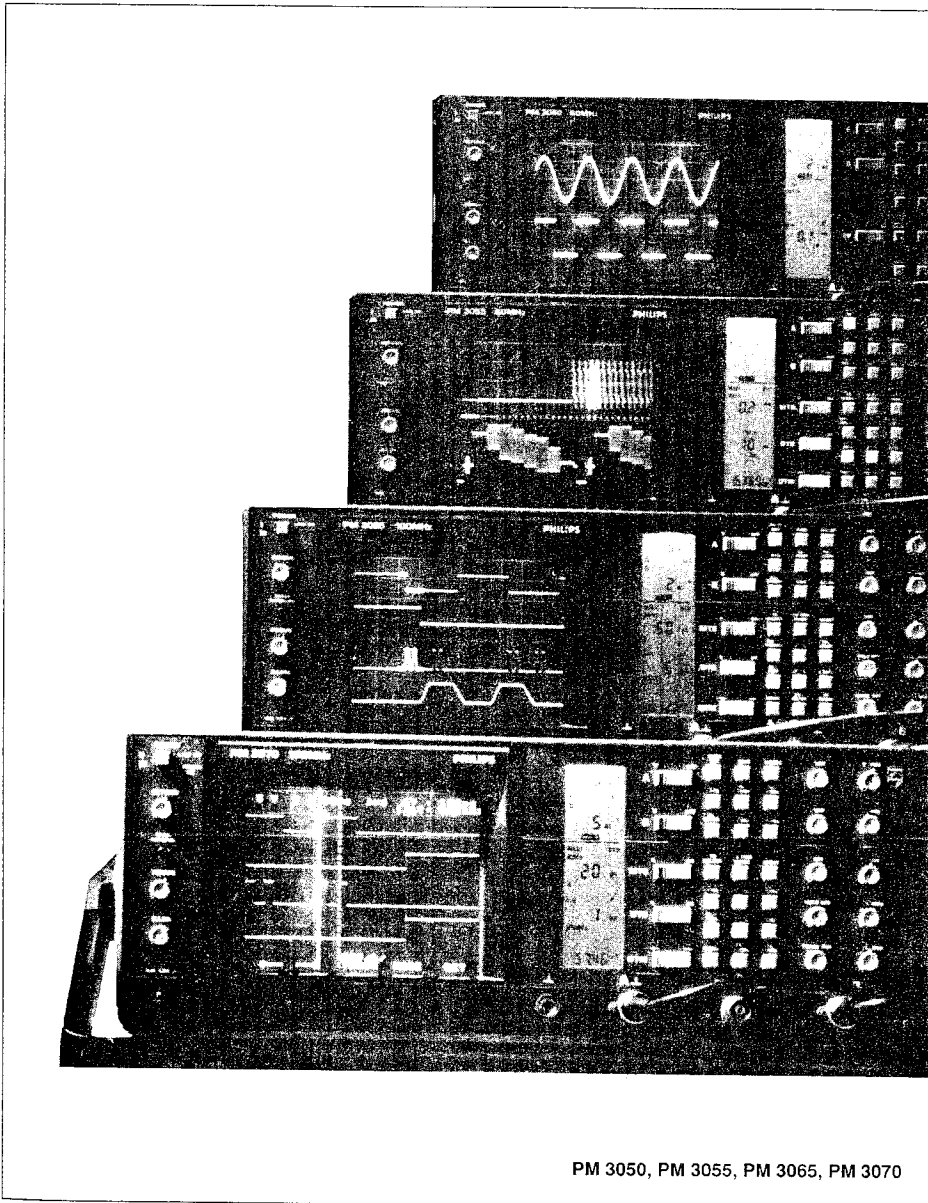


# Analog Oscilloscopes

## PM 3050, PM 3055, PM 3065 & PM 3070



RS-232



PM 3050, PM 3055, PM 3065, PM 3070

### The New 60/100 MHz Standards

The PM 3050 to PM 3070 series of oscilloscopes set new standards in the 60 to 100 MHz oscilloscope range. A new standard in convenience and ease of use together with a new price/performance standard for instruments of this class.

The series consists of four models which are all optionally available in rackmount versions for systems use. These are:

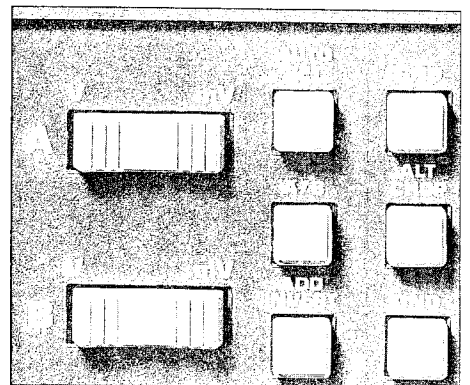
- PM 3050 60 MHz 2 channel, single time base
- PM 3055 60 MHz 2+1 channel, dual time base
- PM 3065 100 MHz 2+1 channel, dual time base
- PM 3070 100 MHz 2+1 channel, dual time base with clever cursors

Each unit represents a significant step forward in scope technology through their use of micro-computer control to both speed up and simplify the task of signal measurements.

Standard features in all models include AUTOSET for single pushbutton set up; a large backlit LCD showing all operating parameters; fast up/down rocker keys and cold switching for high reliability.

### Measurements in Seconds

Just press the green AUTOSET button and automatic setting of channel amplitude, time base sweep speed and triggering takes place, for any signal. If only one channel is connected only one channel is displayed but if both channels are being used then both are automatically scaled and displayed. Triggering takes place on the lower frequency channel to give a clear jitter free display. AUTOSET eliminates time consuming manual range finding and adjustment to give fast accurate results at the touch of one button.



Just press the green AUTOSET button and automatic setting of channel amplitude, time base, sweep speed and triggering takes place, for any signal.

### PM 3050/55 60 MHz & PM 3065/70 100 MHz Oscilloscopes

AUTOSET for automatic amplitude, time, and trigger setting

LCD panel displays status and settings

16 kV CRT acceleration voltage

Fast action up/down controls and cold switching

GPIB/IEEE-488 interface option

Single time base, dual time base and cursor versions

# Analog Oscilloscopes

## PM 3050, PM 3055, PM 3065 & PM 3070

### Clean and Simple Operation

With up/down rocker keys for amplitude and time base speed selection and pushbuttons for display mode and trigger source selection the operation of this series of oscilloscopes is kept clean and simple. Upon each user action the backlit LCD display is immediately updated making at a glance review of the scopes current parameter settings possible rather than having to search the complete front panel to determine the operating conditions.

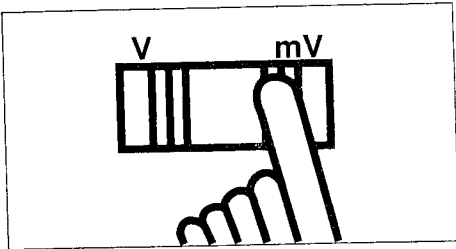
The internal microcomputer prevents illegal setups like incorrect main and delayed time base settings and clearly identifies on the display non-calibrated amplitude settings or grounded inputs. This avoids incorrect measurements, wasted time and frustration.

To speed accurate measurements when using the delayed time base, the LCD gives a digital readout of the delay time so making the calculation of MTB sweep speed x delay time vernier redundant. For infrequent scope users the MENU key functions as a 'help' key showing the facilities offered by each key on the scope and quickly acquainting the user with its operation.

### High Reliability and Easy Service

Behind the pushbutton operation all input signals are switched by hermetically sealed long life reed relays. These keep out damp and dirt from the active signal paths and ensure long life and long term measurement stability.

The advanced modular construction of these scopes allows complete functional testing of each subassembly before they are built together to form a complete instrument. An extended burn-in period lasting 48 hours then follows before another series of extensive tests takes place. This ensures that zero hour defects are almost completely eliminated and results in long term trouble-free operation. In the unlikely event that a failure should occur the modular construction enables easy access to the suspect board without major disassembly.

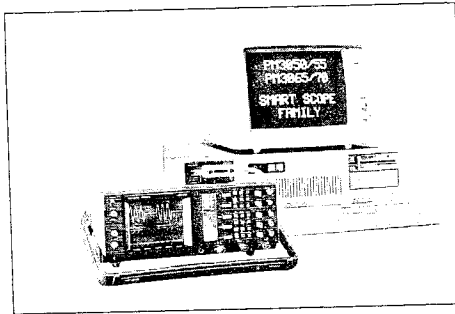


### Advanced CRT

With 16 kV acceleration and advanced electron optics the CRT display has exceptional brilliance combined with a small spot size making it ideal for measurements on high speed or low repetition rate signals. The effective screen area is a full 8 x 10 cm. An internally etched graticule is provided for accurate and parallax-free measurements. Graticule illumination is standard on all models.

### Fast Computer Hook Up

For systems use this Smart Scope series can be simply controlled by the GPIB/IEEE-488\* bus using the PM 8953A interface. This retrofittable interface enables the scopes to be automatically set up for production testing or QA applications.

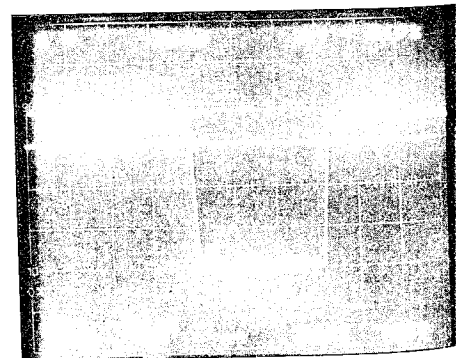
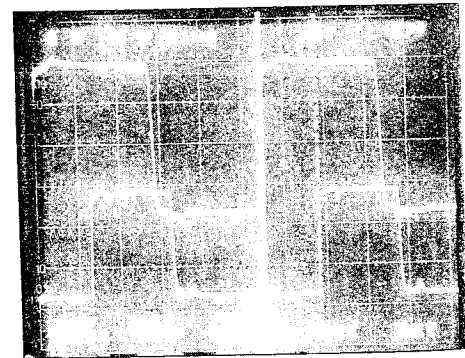
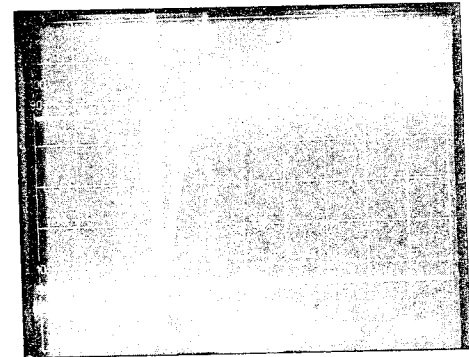
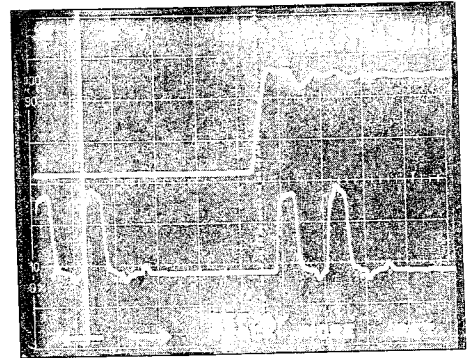


The PM 8953A IEEE-488 interface is a separate unit which simply plugs onto the rear of the scope. This can be of particular interest for fleet owners as it permits automatic IEEE-488 based recalibration of the complete fleet with only one interface needing to be purchased. This saves time in recalibration, and money as well.

### Clever Cursors

The PM 3070 offers full cursor measurement capabilities in both time and amplitude axes. Control of all cursor functions is by five keys in the bezel of the CRT which also are used to independently control the intensity of the alpha-numeric and the cursor intensity. Accurate measurements of peak to peak values, voltage ratios, rise times, phase relationships and time ratios are possible with direct numerical display on the CRT.

A special facility called the ZOOM function enables the signal between the cursors to be expanded to fill the full width of the screen by automatically adjusting the delay time and delay time base speed. This makes it easy to zoom in on a particular point of interest without having to consider how to set up the delay time section. In addition to the measured data both channel and time base status is displayed on screen and user text or messages can also be specified.

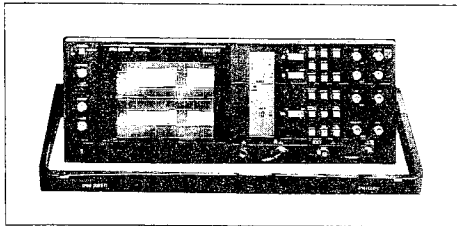


\*The terms GPIB and IEEE-488 may be used interchangeably throughout this catalog.

# Analog Oscilloscopes

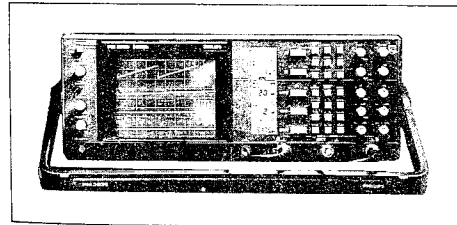
## PM 3050, PM 3055, PM 3065 & PM 3070

### PM 3050 60 MHz 2 Channels, Single Time Base



With all the standard facilities of the Smart Scope series this basic instrument provides comprehensive trigger facilities like TV line, TV frame, Peak-Peak Auto and dc coupling in addition to trigger hold off. Time base speeds to 5 nsec per division are standard as well as x1 and x10 probe identification. X deflection via either channel is possible.

### PM 3055 60 MHz 2+1 Channels, Dual Time Base

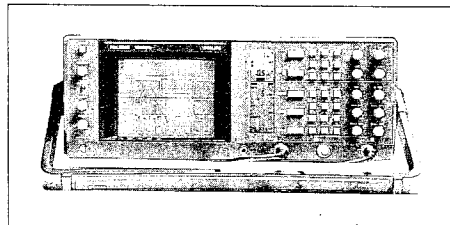


PM 3055 60 MHz oscilloscope with delayed time base and third channel trigger view.

The external trigger input of this scope doubles as a third input channel with a fixed attenuation. The Delayed Time Base facility can be directly triggered from the main time base or from either input channel. Display of MTB intensified and DTB is possible at the same time or independently.

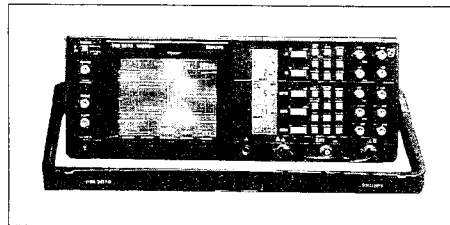
### PM 3065 100 MHz 2+1 Channels, Dual Time Base

Triggering to 150 MHz plus the high intensity CRT makes this unit the ideal general purpose workhorse. The fast 3.5 nsec rise time and good pulse response characteristics make the PM 3065 the ultimate 100 MHz oscilloscope.



PM 3065 100 MHz oscilloscope with delayed time base and third channel trigger view.

### PM 3070 100 MHz 2+1 Channels, Dual Time Base, Clever Cursors



PM 3070 100 MHz delayed sweep oscilloscope with clever cursors.

The clever cursors provide both amplitude and time measurement capabilities. In the amplitude mode peak to peak, ratio and 10% and 90% levels (for rise times) can be read directly from the display.

In the time mode, rise times, ratio and phase measurements can be made and read from the display. In addition the ZOOM facility enables fast pinpointing and expansion of a specific section of the measured signal.

## Specifications

### Technical Specifications

**Display:** CRT 8 x 10 cm viewing area, P31 phosphor, 16 kV acceleration voltage. Parallax-free graticule with continuously variable illumination. Separate LCD for display of menus, settings, status indications, etc. LCD is constantly illuminated by backlighting.

#### AUTOSET

Autoset selects proper channel, sets vertical deflection, timebase speed and triggering for easy-to-read display of input signals.

#### Vertical Deflection

**Display Modes:** Ch A, Ch B, -Ch B, Ch A + Ch B, Ch A - Ch B, YB

**Trigger View:** In any combination, chopped or alternate (not PM 3050).

#### Frequency Response

**PM 3065/70:** DC to >100 MHz -3 dB (20 mV/div to 10 V/div); dc to >75 MHz -3 dB (2 mV/div to 10 mV/div)

**PM 3050/55:** DC to >60 MHz -3 dB (20 mV/div to 10 V/div); dc to >35 MHz -3 dB (2 mV/div to 10 mV/div)

**In AC Mode:** Lower -3 dB point is <10 Hz

#### Rise Time

**PM 3065/70:** <3.5 ns (20 mV/div to 10 V/div); <4.9 ns (2 mV/div to 10 mV/div)

**PM 3050/55:** <6 ns (20 mV/div to 10 V/div) <10 ns (2 mV/div to 10 mV/div)

**Deflection Coefficient:** 2 mV/div to 10 V/div in steps of 1, 2, 5 sequence

**Error Limit:** 3%. continuous control between steps with > flashing in LCD as warning symbol for uncal amplitude.

**Input Impedance:** 1 M $\Omega$   $\pm$ 2%/20 pF  $\pm$ 2 pF

**Max. Rated Input Voltage:** 400V (dc + ac peak)

**Dynamic Range:** >24 div at 10 MHz; >8 div at 100 MHz (PM 3065/70); >8 div at 60 MHz (PM 3050/55)

**CMRR:** 100:1 at 1 MHz

#### Trigger View

##### Frequency Response

**PM 3065/70:** DC to >100 MHz -3 dB (via ext); dc to >75 MHz -3 dB (Ch A or Ch B)

**PM 3050/55:** DC to >-3 dB (via ext 0°C to 35°C); dc to >50 MHz -3 dB (via Ch A or Ch B)

**Deflection Coefficient:** 100 mV/div via Ext Input 2 mV/div to 10 V/div via Ch A or Ch B

##### Horizontal Display Modes

**PM 3055/65/70:** MTB, MTBI, Alt TB, DTB, X-deflection

**PM 3050:** TB, X-deflection

#### Main Time Base (MTB or Time Base (TB))

**Time Coefficients:** 0.5 s/div to 50 ns/div in steps of 1, 2, 5 sequence

**Magnifier:** x10

**Fastest Sweep Speed:** 5 ns/div

**Error Limit:** 3%

**Error Limit Magnifier Sweep:** 4%, Continuous control between steps with > flashing in LCD as warning symbol for uncal sweep

**Hold-off:** Continuously adjustable up to 10x min value

#### Delayed Time Base (DTB) (not PM 3050)

**Time Coefficient:** 1 ms/div to 50 ns/div in steps of 1, 2, 5 sequence

**Magnifier:** x10

**Fastest Sweep Speed:** 5 ns/div

**Error Limit:** 3%

**Error Limit Magnifier Sweep:** 4%

**Trace Separation:**  $\pm$ 4 div DTB shift only

#### Delay Time Base Multiplier (DTM) (not PM 3050)

**Resolution:** 1:10,000

**Error Limit Total:** 4% (in x10 magnifier)

**Delay Time Jitter:** 1 in >20,000

# Analog Oscilloscopes

## PM 3050, PM 3055, PM 3065 & PM 3070

### Triggering (MTB or TB)

**Trigger Modes:** Auto (free run), Non-Auto Triggered, Single

**Trigger Sources:** Ch A, Ch B Composite (Ch A, Ch B), Ext. (dc or ac), Line LCD indicates "Not triggered," "Triggered" or "Armed" status

**Trigger Coupling:** Peak to peak (p-p), dc, TVL, TVF

### Triggering (DTB) (not PM 3050)

Starts, Ch A, Ch B, Composite (Ch A, Ch B), ext TVL (only if MTB TV selected)

### Trigger Sensitivity

PM 3050/55	Internal	External
10 MHz	0.5 div	50 mV
60 MHz	1 div	150 mV
100 MHz	3 div	500 mV
TVF/TVL	0.7 div sync	70 mV sync
Level Range	±8 div	±800 mV

PM 3065/70	Internal	External
10 MHz	0.5 div	50 mV
100 MHz	1.2 div	150 mV
150 MHz	2 div	500 mV
TVL/TVF	0.7 div sync	70 mV sync
Level Range	±8 div	±800 mV

Slope positive ( / ), or negative ( \ ), TVF or TVL positive (+) or negative (-)

### X-Deflection

**Deflection Coefficient:** Via Ch A or Ch B, 2 mV/div to 10 V/div; via ext input 100 mV/div

**Frequency Response:** DC to 2 MHz

**Error Limit:** 5%

**Phase Shift:** <3° (at 100 kHz)

**External Input:** 1 MΩ ±2%/20 pF ±2 pF

**Max Input Voltage:** 400V (dc + ac peak)

### Cursor Measurements (PM 3070)

**Features:** V, t, 1/t, Ratio

Phase,

Rise Time (4 way cursors),

Zoom

**Settings:** User text, Settings readout, Intensity control independent of trace

### Output Options

Y Signal out from Channel A (not PM 3065/70)

**Deflection Coefficient:** 100 mV/div, load 10 kΩ; 40 m/div, load 50Ω

### Frequency Response

**PM 3065/70:** >75 MHz -3 dB

**PM 3050/55:** >60 MHz -3 dB

**MTB Sweep Out:** Output voltage 0.5V/div; load 1 MΩ

**MTB Gate Out:** High when running MTB sweep; otherwise low; voltage output high >2.4V; low <0.4V

**DTB Gate Out:** High when running MTB sweep; otherwise low; voltage output high >2.4V; low <0.4V

Check the comprehensive range of system oriented accessories for the PM 3065/PM 3070 to specify exactly the configuration you need. These options add extra functions, convenience and transportability to everyday work with your oscilloscope.

## General Specifications

### Power Supply

Safety requirements meet following specifications: IEC 348 Class I, UL 1244, CSA 556B, VDE 0411

**Line Voltage:** 100V to 240V ±10% in one range

**Line Frequency:** 50 Hz to 400 Hz ±10%

**DC Nominal Voltage:** 145V to 335V

**Power Consumption (ac source):**

**PM 3050/55:** 50W

**PM 3065/70:** 60W

### Miscellaneous

**Calibration Output:** 1.2V ±1%

**Frequency:** 2 kHz

**Z-modulation Input:** TTL-compatible, >2.0V blanks display; <0.8 max intensity, analog control possible between 2.0V and 0.8V

### Environmental Data

#### Temperature

**Rated Range of Use:** +10°C to +40°C

**Limited Range of Operation:** 0°C to +50°C

**Storage:** -40°C to +75°C

#### Altitude

**Operating:** 15,000 ft (4,500m)

**Non-Operating:** 40,000 ft (12,000m)

**Humidity:** 95% RH

**EMI:** Meets requirements of MIL-STD-461 Class B, VDE 0871 and VDE 0875 Grenzwert-klasse B

#### Shock

**Operating and Non-operating:** 30g, 1/2 sine, 11 ms duration, 6 shocks in each direction (3 each face), for a total of 18 shocks

**Vibration:** 5 Hz to 55 Hz, 15 minutes along each of three axes, with a maximum acceleration of 3g. Resonance dwell of 10 minutes at each frequency where resonance occurs, or at 33 Hz when no resonance found.

**Bench Handling:** MIL-STD-810, method 516, procedure V. The PM 3050/55/65/70 are designed to meet the requirements of MIL-T-28800 D, Type III, Class 5, Style D.

### Mechanical Data

#### Width

**Incl Handle:** 387 mm (15.2 in)

**Excl Handle:** 350 mm (13.8 in)

#### Length

**Incl Handle, Excl Knobs:** 518 mm (20.4 in)

**Excl Handle and Knobs:** 433.5 mm (17.1 in)

**Incl Handle and Knobs:** 530.5 mm (20.9 in)

**Excl Handle, Incl Knobs:** 455.7 mm (17.9 in)

### Height

**Incl Feet:** 146.5 m (5.8 in)

**Excl Feet:** 134.5 mm (5.3 in)

**Excl Lower Cabinet:** 132.5 mm (5.2 in)

**Weight:** Approx 7.5 kg (16.5 lb) excl access

**Included with Instrument:** 1 set 100 MHz, 10:1 probes with 4 ft (1.2m) cable and scale factor readout (unless noted); blue CRT contrast filter; operating manual

## Ordering Information

### Models

January 1990 prices

<b>PM 3050</b> 60 MHz Oscilloscope .....	\$1150
<b>PM 3052</b> same, with Rackmount .....	1300
<b>PM 3055</b> 60 MHz Oscilloscope with 2+1 channels and delayed sweep ...	1375
<b>PM 3057</b> same, with Rackmount .....	1525
<b>PM 3065</b> 100 MHz Oscilloscope with 2+1 channels and delayed sweep ...	1745
<b>PM 3067</b> same with Rackmount .....	1895
<b>PM 3070</b> 100 MHz Oscilloscope with 2+1 channels, cursors and delayed sweep .....	1945
<b>PM 3072</b> same, with Rackmount .....	2095

### Optional Configurations

When ordering, select basic "PM" Model desired from above, and add the configuration option number listed below as a suffix.

/003 Basic Oscilloscope as listed above .....	N/C
/003B Basic Oscilloscope w/PM 8926 Economy Probes (only available on 60 MHz models) .....	less 55
/113 CRT with P7 Long Persistence Phosphor .....	add 60
/703 Y Signal Output (only available on 60 MHz models) .....	add 100
/743 MTB Sweep + MTB gate + DTB Gate Outputs .....	add 100
/753 MTB Sweep + MTB gate + DTB Gate Outputs, P7 Phosphor .....	add 160
/763 Y Signal Output (only available on 60 MHz models), plus MTB Gate + DTB Gate Outputs .....	add 190
/773 Y Signal Output (only available on 60 MHz models), plus MTB Gate + DTB Gate Outputs, P7 CRT .....	add 250

### Example, Ordering Configuration

To order the 60 MHz, dual timebase oscilloscope in a rackmount configuration with MTB Sweep + MTB Gate + DTB Gate Out:

	Model	Price
Oscilloscope	PM 3072	\$2085
Configuration Option Suffix	/743	100
Complete Model Number	PM 3072/743	2185

# Analog Oscilloscopes

## PM 3050, PM 3055, PM 3065 & PM 3070

### Accessories (Also see end of Section 2)

#### Passive Probes

PM 8922/501 1:1 10:1 Probe, 1.2m (4 ft) Cable .....	\$ 50
PM 8924/00 1:1 Probe, 1.5m (5 ft) Cable .....	60
PM 8924/20 1:1 Probe, 2.5m (8 ft) Cable .....	60
PM 8926/29 10:1 Probe w/Readout, 2.5m (8 ft) Cable .....	95
PM 8926/501 10:1 Probe, 1.2m (4 ft) Cable .....	60
PM 8926/591 10:1 Probe w/Readout, 1.2m (4 ft) Cable .....	70
PM 8931/09 20 MΩ, 100:1 Probe w/Readout .....	145

#### Active Probes

PM 8940/09Q High Voltage Isolation Amplifier w/Readout .....	\$ 975
PM 8943Q 650 MHz FET Probe .....	875
PM 9355/09Q AC Current Probe w/Readout .....	1150

#### Other Accessories

PM 8901Q Rechargeable Battery Pack ..	\$1600
PM 8917/003 Video Sync Separator and Line Selector .....	600

PM 8953A/00 External, Retrofittable GPIO IEEE-488 I/F .....	\$ 550
PM 8988 Protective Front Panel Cover ..	35
PM 8991/01 Oscilloscope Compact Cart ..	475
PM 8999 Oscilloscope Stand .....	150
PM 8992/80 Accessory Pouch .....	45
PM 8998 Front Panel Memory for PM 3050 to 70 .....	75
PM 9051 BNC to 4 mm Banana Adapter .....	20
PM 9381 Oscilloscope Camera .....	650
PM 2195/09 Probe Switch .....	650
PM 2122/01 50Ω Coaxial Switch .....	700

### Customer Support Services

#### Warranty

Three-year product warranty. See Section 16 for further information on warranty terms and conditions.

#### Extended Warranty

A 10% discount is available when you order the following at the time of the instrument purchase or when ordered within the factory warranty period.

SC1-PM 3050 Repair .....	\$ 176
SC2-PM 3050 Calibration .....	174
SC3-PM 3050 Full Service .....	329
SC4-PM 3050 Performance Verification+	104
SC1-PM 3055 Repair .....	176
SC2-PM 3055 Calibration .....	174
SC3-PM 3055 Full Service .....	329
SC4-PM 3055 Performance Verification+	104
SC1-PM 3065 Repair .....	185
SC2-PM 3065 Calibration .....	200
SC3-PM 3065 Full Service .....	363
SC4-PM 3065 Performance Verification+	120
SC1-PM 3070 Repair .....	205
SC2-PM 3070 Calibration .....	200
SC3-PM 3070 Full Service .....	381
SC4-PM 3070 Performance Verification+	120

*Note: Incoming and/or outgoing calibration readings are available as an option.*

*Note: The above configurations meet North American power requirements. For other power options, see Section 18.*