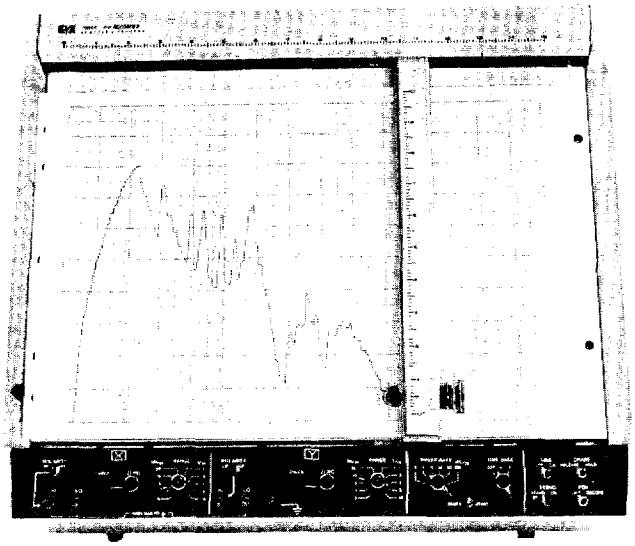
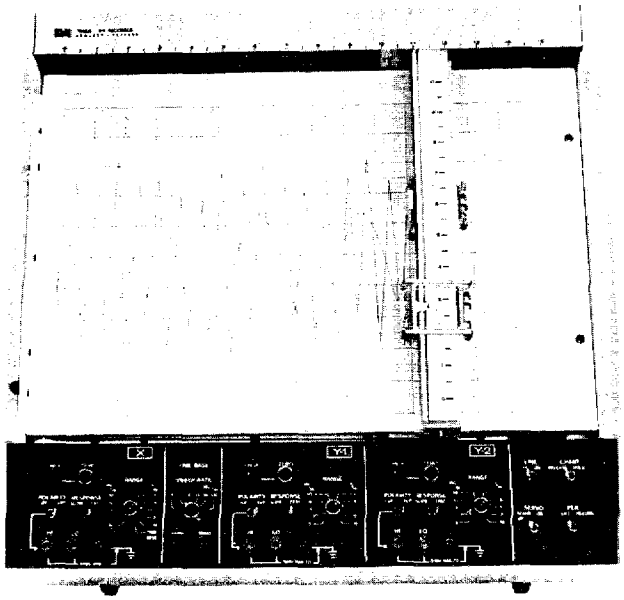
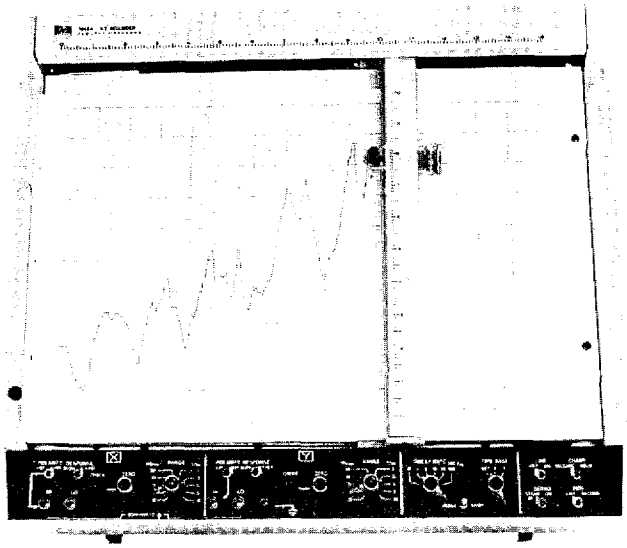


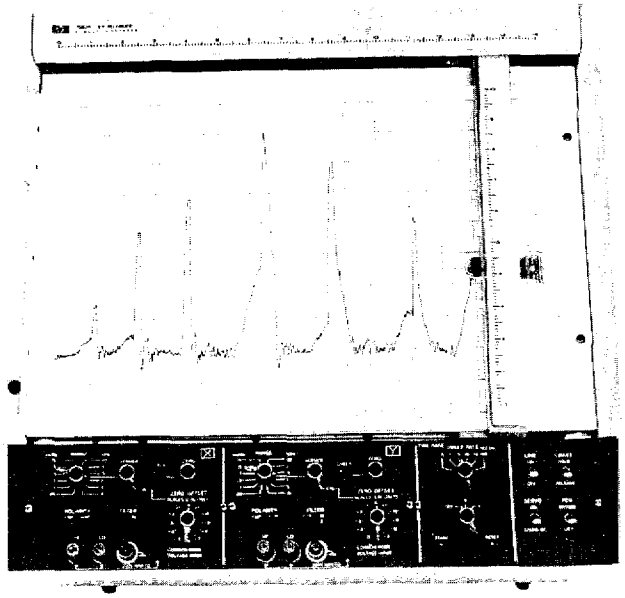
7044A
- Medium dynamic response
- Rugged design for long-lasting laboratory use



7046A
- Two-pen, high dynamic response
- Fast response to fast-changing signals



7045A
- High dynamic response
- Precise recording of fast-changing signals



7047A
- High dynamic response
- Highest sensitivity recording

RECORDERS & PRINTERS

High dynamic performance X-Y recorders

Models 7044A, 7045A, 7046A, 7047A (cont.)

7044A, 7045A, and 7047A Specifications

Performance Specifications

	7044A MEDIUM SPEED	7045A HIGH SPEED	7046A 2-PEN, HIGH SPEED	7047A HIGH SENSITIVITY, HIGH SPEED
Type of input	Front and rear input. Floating, guarded. Polarity reversal switch on front panel.			Front input only. Floating, guarded. Common mode driver circuit eliminates need to connect CMV to recorder, if CMV <10 V peak.
Input ranges	0.5, 1, 5, 10, 50 mV/in. 0.1, 0.5, 1, 5,10 V/in. (metric available in 0.25, 0.5, 2.5, 5, 25 mV/cm; 0.05, 0.25, 0.5, 2.5, 5 V/cm). Continuous vernier between ranges.			0.05, 0.1, 0.5, 1, 5, 10 mV/in.; 0.05, 0.1, 0.5, 1.5, 10 V/in. (metric available in 0.02, 0.05, 0.1, 0.5, 1, 5 mV/cm; 0.01, 0.05, 0.1, 0.5, 1, 5 V/cm). Continuous vernier between ranges.
Input resistance	1 megohm constant on all ranges			
Source resistance	10 k ohm maximum on all ranges			10 k ohm max except 0.02 mV/cm, 0.05 mV/cm, and 0.1 mV/cm (0.05 mV/in. and 0.1 mV/in.) ranges are 2 k ohm max.
Accuracy	±0.2% of full scale (includes linearity and deadband) at 25°C. Temp coefficient ±0.01% per °C			
Range accuracy	±0.2% of full scale ±0.2% of deflection (includes linearity and deadband) at 25°C. Temp coefficient ±0.01% per °C.			
Deadband	0.1% of full scale			
Common mode rejection	110 dB and 90 dB AC (exceeds 130 dB DC and 110 dB AC under normal lab environmental conditions) with 1 k ohm between HI and LO terminals. CMV applied between ground and LO, and attenuator on most sensitive range. CMR decreases 20 dB per decade step in attenuation.			130 dB DC and 130 dB AC with 1 k ohm imbalance in HI or LO terminal (exceeds 150 dB under normal conditions). CMR decreases 20 dB per decade step in attenuation from most sensitive range.
Normal mode rejection	Internal filter not available			30 dB min at line frequency with FILTER IN. (50 dB typical at 60 Hz and 40 dB at 50 Hz.)

Dynamic Specifications

Slewing speed	50 cm/s (20 in./s), min.	76 cm/s (30 in./s) minimum. 97 cm/s (38 in./s) typical under normal lab conditions.		
Acceleration peak–Y axis	2540 cm/s² (1000 in./s²)	7620 cm/s² (3000 in./s²)	6350 cm/s² (2500 in./s²)	7620 cm/s² (3000 in./s²)
–X axis	1270 cm/s² (500 in./s²)	5080 cm/s² (2000 in./s²)	3800 cm/s² (1500 in./s²)	5080 cm/s² (2000 in./s²)
Overshoot	2% of full scale maximum.	1% of full scale maximum.		

Offset Specifications

Zero offset	Zero may be placed anywhere on the writing area or electrically off scale up to one full scale from zero index.	11 calibrated scales of zero offset in both axes. Switchable in steps of full scale from +1 to −10.
Offset accuracy at 25°C (applies to calibrated unit)	Not applicable	±0.1% of full scale times N where N = number of scales of offset.
Temperature coefficient	Not applicable	±0.004% of full scale times N per °C.

Time Base Specification

Time base	Optional: 6 speeds: 0.25, 0.5, 2.5, 5, 25, 50 sec/cm (English is 0.5, 1, 5, 10, 50, 100 sec/in.) switchable to X or Y axis (7046A only to X axis).	Standard: 6 speeds: 0.1, 0.5, 1, 5, 10, 50 s/cm (English is 0.5, 1, 5, 10, 50, 100 s/in. switchable to X or Y axis.
Time base accuracy	1.0% at 25°C. Temp coefficient at ±0.1%/C°	

General Specifications

Power	100, 120, 220, 240 Vac +5 −10%; 48 to 440 Hz; 135 VA	100, 120, 220, 240 Vac +5 −10%; 48 to 440 Hz; 175 VA	100, 120, 220, 240 Vac +5 −10%; 48 to 440 Hz; 175 VA	100, 120, 220, 240 Vac +5, −10%; 48 to 66 Hz; 180 VA
Pen lift	Electric (remote via TTL level)			
Writing area	25 x 38 cm (10 x 15 in.)			
Weight	Net 13.7 kg (30 lb)		Net 16 kg (35 lb)	Net 18.6 kg (41 lb)
Size	400 H x 483 W x 165 mm D (15¾ x 19 x 6½ in.)		441 H x 483 W x 173 mm D (17⅜ x 19 x 6¹⁵⁄₁₆ in.)	

7044A, 7045A, 7046A and 7047A Options

7044A, 7045A

Option No.	Description	Price
001:	Time Base	$255
002:	Event marker	$120
006:	Metric calibration	N/C

7046A

Option No.	Description	Price
001:	Time base	$255
002:	Event marker	$120
007:	Metric calibration	N/C

7047A

Option No.	Description	Price
001:	Metric calibration	N/C
002:	Event marker	$120

Ordering Information

	Price
7044A Medium speed recorder	$2200
7045A High speed recorder	$2550
7046A 2-pen, high speed recorder	$3700
7047A High sensitivity, high speed recorder	$3900

High dynamic performance X-Y recorders

Models 7044A, 7045A, 7046A, 7047A

The 7044A, 7045A, 7046A, and 7047A offer the prospective X-Y recorder user an excellent choice of instruments to fill specific and general needs. The 7044A is a one-pen recorder for general laboratory use; the 7045A provides very high slewing speeds and acceleration; the 7046A is a two-pen recorder that provides many of the 7045A performance features; the 7047A is the most sensitive high-performance recorder provided by Hewlett-Packard.

This group of HP X-Y recorders comes equipped with a trouble-free electrostatic paper hold down capable of securing paper sizes up to ISO A3 or 280 x 432 mm (11 x 17 in.). The units draw with easy-to-change disposable pens available in four colors (blue, green, red, and black) for the 7044A, 7045A, 7047A, and three colors (blue, red, and black) for the 7046A. In addition, each unit is designed with a plastic-coated wirewound balance potentiometer, and other modern circuitry and techniques that help reduce failure and minimize maintenance down time.

The 7044A Explained

The one-pen 7044A is a medium speed recorder designed to offer the features and performance required for most general-purpose measurements in the medium speed range. This cost-effective instrument provides front-panel polarity switches to reverse pen direction without having to reverse input leads, plus TTL remote control and rear connector to provide remote control of capabilities, such as pen lift, servo mute, electrostatic paper hold down, and event marking. A continuous duty aluminum frame DC servo motor reduces overheating and wear even if the pen is driven off scale for an indefinite period of time.

Other outstanding 7044A features include 10 calibrated scales of DC input ranges on each axis from 0.25 mV/cm to 5 v/cm (0.5 mV/in. to 10 V/in.). Arbitrary full-scale voltage ranges may be established with vernier control in conjunction with the calibrated DC ranges. Options include a time base, metric scaling, and an event marker.

The 7045A Explained

The one-pen 7045A recorder is designed for higher speed applications, offering greater slewing speed and acceleration in both X and Y axes. This high dynamic performance allows the 7045A to do precision charting of a wide range of fast changing input signals. The 7045A also provides front-panel polarity switches to reverse pen direction without having to reverse input leads; a response switch that allows the user to slow recorder response for easier set up; and continuous duty aluminum frame DC servo motors. These motors are designed to reduce overheating and pen wear if the pen is driven off scale for an indefinite period of time.

Other important 7045A features include 10 calibrated DC input ranges on each axis from 0.25 mV/cm to 5 V/cm (0.5 mV/in. to 10 V/in.) Between ranges, a 1, 5, 10 sequence is used. Arbitrary full scale voltage ranges may be established with the vernier control in conjunction with the calibrated DC ranges. Options include time base, metric scaling, and TTL remote control.

The 7046A Explained

The 7046A is a two-pen general-purpose recorder designed to ensure high quality recordings without sacrificing the ruggedness and dependability so important for a laboratory recorder. This two-pen instrument has high dynamic performance, offering Y axis acceleration that exceeds 6350 cm/s² (2500 in.s²). With this fast acceleration, the 7046A can reproduce a wide range of fast changing input signals. In addition, both Y axes have virtually no overshoot, providing extremely accurate plotting of two variables against a third variable. Basically, the 7046A offers a dynamic performance similar to the 7045A, but with a two-pen advantage.

The 7046A provides front-panel polarity switches to reverse pen direction without having to reverse input leads; a response switch that allows the user to slow recorder response for easier set up; TTL remote control and rear connector to provide remote control of capabilities, such as pen lift, servo mute, electrostatic hold down, and the event marker. The unit is also equipped with continuous duty aluminum frame DC servo motors designed to reduce overheating and pen wear if the pen is driven off scale for an indefinite period of time.

Other major features include 10 calibrated DC input ranges on each axis from 0.25 mV/cm to 5 V/cm (0.5 mV/in. to 10 V/in.). Between ranges, a 1, 5, 10 sequence is used. Arbitrary full scale voltage ranges may be established with the vernier control in conjunction with the calibrated DC ranges. Options include time base, metric scaling, and an event marker.

The 7047A Explained

The one-pen 7047A is the most sensitive high-performance instrument in the Hewlett-Packard X-Y recorder line. The 7047A features the high dynamic response of the 7045A plus microvolt sensitivity in the range of 0.02 mV/cm to 5 V/cm (0.05 mV/in. to 10 V/in.) without any loss in ruggedness or reliability. This powerful recorder has a minimum slewing speed of 76 cm/s (30 ips); peak acceleration of 7620 cm/s² (3000 ips²) in the Y axis. With this response, the 7047A can record an extremely wide range of fast changing input signals.

The 7047A provides front-panel polarity switches to reverse pen direction without having to reverse input leads; a response switch that allows the user to slow recorder response for easier set up; TTL remote control and rear connector to provide remote control of capabilities, such as pen lift, servo mute, electrostatic paper hold down, and the event marker. The preamplifiers for the X and Y axes are enclosed in two specially designed aluminum enclosures. These modules, which also contain the chopper DC amplifiers, are exceptionally simple to service as each module can be removed easily and, with the cable extender available in the standard accessory kit, can be operated outside of the mainframe.

Other superior features include 12 calibrated DC input ranges on each axis from 0.02 mV/cm to 5 V/cm (0.05 mV/in. to 10 V/in.). Except for the 0.02 mV/cm setting, a 1, 5, 10 sequence is used. Arbitrary full scale voltage ranges can be established with the vernier control in conjunction with the calibrated DC ranges. In addition, the 7047A offers a time base with six sweep speeds; a common mode drive circuit that eliminates the need to connect CMV source to CMV terminal, if CMV remains below 10 V; calibrated offset of 11 scales (1 through −10); a switchable input filter that provides 40 dB of normal mode rejection; and a motor design that reduces overheating and wear if the pen is driven off scale for an indefinite period of time. Options include metric scaling and an event marker.