

TABLE 1-1

## MODEL 3440A PERFORMANCE SPECIFICATIONS

Frequency Range:

Calibrated 10 kHz to 1.2 GHz; usable < 10 kHz to > 2.4 GHz.

Response:

True RMS to 30 mV, changing gradually to peak detector calibrated in rms of a sine wave above 30 mV.

Range:

Usable < 100 microvolts to 3 volts rms.

Eight Ranges selected by front panel switch:

100 $\mu$ V to 1 mV FS (-70 dBm to -50 dBm)	100 mV FS (-10 dBm)
3 mV FS (-40 dBm)	300 mV FS (0 dBm)
10 mV FS (-30 dBm)	1 V FS (+10 dBm)
30 mV FS (-20 dBm)	3 V FS (+20 dBm)

dB readings are referenced to 0.221 Volts (0 dBm, 1 mW into 50 ohms).

Crest Factor:

					With 100:1 Divider			
Range (FS)	1 mV	3 mV	10 mV	30 mV	.1 V	.3 V	1 V	3 V
Crest Factor	420 to 42	42 to 14	14 to 4.2	4.2 to 1.4	420 to 42	42 to 14	14 to 4.2	4.2 to 1.4

Accuracy:

Ranges (Full scale)	Frequency		
	10 kHz to 150 MHz	150 MHz to 700 MHz	700 MHz to 1.2 GHz
1 mV to 300 mV*	$\pm(1\% \text{ FS} + 1\% \text{ Ind})$	$\pm(1\% \text{ FS} + 3\% \text{ Ind})$	$\pm(1\% \text{ FS} + 7\% \text{ Ind})$
1 V to 3 V	$\pm(1\% \text{ FS} + 1\% \text{ Ind})$	$\pm(1\% \text{ FS} + 3\% \text{ Ind})$	$\pm(1\% \text{ FS} + 10\% \text{ Ind})$

NOTE: FS = full scale; Ind = indication

\* Below 1 mV add  $\pm 1\%$  FS

Reference conditions 20 to 25°C, 10 minutes warm-up

TABLE 1-1. MODEL 3440A PERFORMANCE SPECIFICATIONS - Continued

Temperature Effects:

A heater system in the detector probe maintains detector temperature in the range of 23° to 28° C at all ambient temperatures to 0°C.

Ambient	With probe heater set to 25°C	With probe heater set to 35°C
30°C to 40°C	Add <u>+4%</u> of indication	Add <u>+3%</u> of indication
25°C to 30°C	Add <u>+1%</u> of indication	Add <u>+0.5%</u> of indication
10°C to 15°C	Add <u>+1%</u> of indication	Add <u>+1%</u> of indication
0°C to 10°C	Add <u>+4%</u> of indication	Add <u>+4%</u> of indication

Meter:

The instrument incorporates an analog meter for readout. Three scales and anti-parallax mirror are provided. The 0 to 10 scale is uppermost and is 4.4 inches long. The 0 to 3 scale is below, followed by a -10 to +3 dBm scale. dBm reference is .221 volts equals 0 dBm (0 dBm = 1 mW into 50 ohms).

Indicator unrest: (1 mV FS range)

Unrest of the meter pointer will be  $\leq +1\%$  FS above 600  $\mu$ V indication,  $\leq +2\%$  FS between 300 and 600  $\mu$ V and  $\leq +5\%$  FS from 100  $\mu$ V to 300  $\mu$ V.

Response Time and Overload Recovery:

Less than 1 second meter response on 3 mV to 3 V ranges, increasing to 3 seconds risetime on 1 mV range. The instrument recovers within 10% of final indication within one minute after removing 3 V (rms) overload on 1 mV range. A response switch permits selection of slow or normal response times when measuring input signals having time varying amplitude components.

Detector Probe:

A detachable probe containing the RF detector is provided. The shield probe cable is 4 feet (1.2 meters) long and terminated in a quick disconnect locking connector at the front panel. Accessories provided with the probe are:

- (1) 50  $\Omega$  BNC adapter
- (2) Spring-loaded tip, Model 4340A
- (3) Ground clip lead.

Other available accessories are listed in Table 1-2.

Probe Input Impedance:

Typical values measured at 21° to 25°C with probe heater set to 25°C. Option 40 provides probe using diodes with equal capacitance and higher input resistance limits.

Probe Input Shunt Capacitance at 100 kHz:

10 mV	2.8 pF
30 mV	2.7 pF
100 mV	2.5 pF
300 mV	2.3 pF
1 V	2.0 pF
3 V	1.8 pF

TABLE 1-1. MODEL 3440A PERFORMANCE SPECIFICATIONS - Continued

VSWR:

VSWR using probe with non-loading "T" connector in a 50 ohm system is no greater than 1.3 from 10 kHz to 1.2 GHz.

Power Sensitivity:

Probe shall not require more than 1.8 nanowatts of input power at 300 microvolts input voltage when used with a non-loading "T" connector in a 50 ohm system.

Over Voltage:

Probe input is fully protected to 10 V ac on all ranges and frequencies. Maximum dc input is +400 volts on all ranges.

Dc Recorder Output:

Rear panel banana jacks provide +1 volt dc full scale deflection on "10" ranges and .948 volts on "3" ranges into an open circuit. Source impedance is 1000 ohms (+5%). Dc output is short circuit proof. Dc output amplitude may be adjusted by a control accessible from the rear panel. The dc recorder output voltage is directly proportional to the meter deflection and the rms of the probe input voltage. The Dc Recorder Output serves as an ac to dc converter.

Probe Balance:

A probe null balance (meter zero) control knob is provided on the front panel. It permits meter zero adjustment on the most sensitive ranges when no input signal is present.

Relative References:

A REL REF control on the front panel allows continuously variable reduction of sensitivity by a minimum of 3.3 dB. It permits 0 dB reference level change and is useful in setting the meter to conveniently make readings when performing relative dB measurements. A detented CAL position is provided for normal measurements.

Meter Response Time:

1 second risetime on all ranges except 3 seconds on the 1 mV range. A NORMAL/SLOW response switch permits selection of meter response time for measurements of input signals with varying amplitudes.

Environmental Characteristics:

Temperature:

Operating:	0°C to +50°C
Storage:	-54°C to +85°C

Humidity: (No condensation)	80% RH to 50°C
	95% RH to 35°C

Altitude:

Operating:	to 3 km (10,000 feet)
Storage:	to 15 km (50,000 feet)

TABLE 1-1. MODEL 3440A PERFORMANCE SPECIFICATIONS - Continued

Shock and Vibration:

Complies with MIL-T-28800  
Class 3, Style E.

EMI:

Meets requirements of MIL-STD-461A  
for CS-01, CS-06 and RS-03 to  
400 MHz at 1 V/meter.

Safety:

Meets conditions of MIL-T-28800, Class 3, Style E.

Power:

A fused power selector safety switch and receptacle on the rear panel selects one of four ac operating voltage ranges.

90 to 110 V	(100 V)	48 to 420 Hz
108 to 132 V	(120 V)	48 to 420 Hz
198 to 242 V	(220 V)	48 to 420 Hz
216 to 264 V	(240 V)	48 to 420 Hz

Input Power: 10 VA maximum

With Option 05 - Internal rechargeable NI-CAD battery

Running Time: 8 hours  
Rechargeable Time: 16 hours (20 hours maximum)

Dimensions:

Height:	(Case) 133 mm	(5.25")
	(Overall) 147 mm	(5.8")
Width:	(Case) 211 mm	(8.3")
	(Overall) 220 mm	(8.66")
Depth:	(Case) 280 mm	(11")
	(Overall) 305 mm	(12")

The case is all-aluminum with sturdy side extrusions, front and rear die castings and quick disconnect top and bottom covers. It includes a tilt bail and a side mounted carry handle.

Weight: 3 kg. (6.6 lbs) Net  
5.2 kg. (11.5) Shipping

TABLE 1-1A

## MODEL 3440A OPTION 40 PERFORMANCE SPECIFICATIONS

Frequency Range:

Calibrated 10 kHz to 1.2 GHz; usable < 10 kHz to > 2.4 GHz.

Response:

True RMS to 30 mV, changing gradually to peak detector calibrated in rms of a sine wave above 30 mV.

Range:

Usable < 100 microvolts to 3 volts rms.

Eight Ranges selected by front panel switch:

100 $\mu$ V to 1 mV FS (-70 dBm to -50 dBm)	100 mV FS (-10 dBm)
3 mV FS (-40 dBm)	300 mV FS ( 0 dBm)
10 mV FS (-30 dBm)	1 V FS (+10 dBm)
30 mV FS (-20 dBm)	3 V FS (+20 dBm)

dB readings are referenced to 0.221 Volts (0 dBm, 1 mW into 50 ohms).

Crest Factor:

					With 100:1 Divider			
Range (FS)	1 mV	3 mV	10 mV	30 mV	.1 V	.3 V	1 V	3 V
Crest Factor	420 to 42	70 to 14	21 to 4.2	7 to 1.4	420 to 42	70 to 14	21 to 4.2	7 to 1.4

Accuracy:

Ranges (Full scale)	Frequency		
	10 kHz to 100 MHz	100 MHz to 1 GHz	1 GHz to 1.2 GHz
1 mV to 300 mV*	$\pm(1\% \text{ FS} + 1\% \text{ Ind})$	$\pm(1\% \text{ FS} + 3\% \text{ Ind})$	$\pm(1\% \text{ FS} + 7\% \text{ Ind})$
1 V to 3 V	$\pm(1\% \text{ FS} + 1\% \text{ Ind})$	$\pm(1\% \text{ FS} + 3\% \text{ Ind})$	$\pm(1\% \text{ FS} + 10\% \text{ Ind})$

NOTE: FS = full scale; Ind = indication

\* Below 1 mV add  $\pm 1\%$  FS

Reference conditions 20 to 25°C, 10 minutes warm-up

Measured in low VSWR 50 ohm system using Model 5340A Tee Adapter and precision 50 ohm termination.

TABLE 1-1. MODEL 3440A OPTION 40 PERFORMANCE SPECIFICATIONS - Continued

Temperature Effects:

A heater system in the detector probe maintains detector temperature in the range of 23° to 28° C at all ambient temperatures to 0°C.

Ambient	With probe heater set to 25°C	With probe heater set to 35°C
40°C to 50°C	Add <u>+10%</u> of indication	Add <u>+9%</u> of indication
30°C to 40°C	Add <u>+4%</u> of indication	Add <u>+3%</u> of indication
25°C to 30°C	Add <u>+1%</u> of indication	Add <u>+0.5%</u> of indication
10°C to 15°C	Add <u>+1%</u> of indication	Add <u>+1%</u> of indication
0°C to 10°C	Add <u>+4%</u> of indication	Add <u>+4%</u> of indication

Meter:

The instrument incorporates an analog meter for readout. Three scales and anti-parallax mirror are provided. The 0 to 10 scale is uppermost and is 4.4 inches long. The 0 to 3 scale is below, followed by a -10 to +3 dBm scale. dBm reference is .221 volts equals 0 dBm (0 dBm = 1 mW into 50 ohms).

Indicator unrest: (1 mV FS range)

Unrest of the meter pointer will be < +1% FS above 600 uV indication, < +2% FS between 300 and 600 uV and < +5% FS from 100 uV to 300 uV.

Response Time and Overload Recovery:

Less than 1 second meter response on 3 mV to 3 V ranges, increasing to 3 seconds risetime on 1 mV range. The instrument recovers within 10% of final indication within one minute after removing 3 V (rms) overload on 1 mV range. A response switch permits selection of slow or normal response times when measuring input signals having time varying amplitude components.

Detector Probe:

A detachable probe containing the RF detector is provided. The shield probe cable is 4 feet (1.2 meters) long and terminated in a quick disconnect locking connector at the front panel. Accessories provided with the probe are:

- (1) 50  $\Omega$  BNC adapter, Model 6340A
- (2) Spring-loaded tip, Model 4340A
- (3) Ground clip lead.

Other available accessories are listed in Table 1-2.

Probe Input Impedance:

Typical values measured at 21° to 25°C with probe heater set to 25°C. Option 40 provides probe using diodes with equal capacitance and higher input resistance limits.

Probe Input Shunt Capacitance at 100 kHz:

10 mV	2.8 pF
30 mV	2.7 pF
100 mV	2.5 pF
300 mV	2.3 pF
1 V	2.0 pF
3 V	1.8 pF

TABLE 1-1. MODEL 3440A OPTION 40 PERFORMANCE SPECIFICATIONS - Continued

VSWR:

VSWR using probe with non-loading "T" connector in a 50 ohm system is no greater than 1.2 from 10 kHz to 1.2 GHz.

Power Sensitivity:

Probe shall not require more than 1.8 nanowatts of input power at 300 microvolts input voltage when used with a non-loading "T" connector in a 50 ohm system.

Over Voltage:

Probe input is fully protected to 10 V ac on all ranges and frequencies. Maximum dc input is +400 volts on all ranges.

Dc Recorder Output:

Rear panel banana jacks provide +1 volt dc full scale deflection on "10" ranges and .948 volts on "3" ranges into an open circuit. Source impedance is 1000 ohms (+5%). Dc output is short circuit proof. Dc output amplitude may be adjusted by a control accessible from the rear panel. The dc recorder output voltage is directly proportional to the meter deflection and the rms of the probe input voltage. The Dc Recorder Output serves as an ac to dc converter.

Probe Balance:

A probe null balance (meter zero) control knob is provided on the front panel. It permits meter zero adjustment on the most sensitive ranges when no input signal is present.

Relative References:

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Meter Response Time:

1 second risetime on all ranges except 3 seconds on the 1 mV range. A NORMAL/SLOW response switch permits selection of meter response time for measurements of input signals with varying amplitudes.

Environmental Characteristics:

Temperature:

Operating:	-10°C to +55°C
Storage:	-54°C to +85°C

Humidity: (No condensation)

80% RH to 50°C
95% RH to 35°C

Altitude:

Operating:	to 3 km (10,000 feet)
Storage:	to 15 km (50,000 feet)

TABLE 1-1. MODEL 3440A OPTION 40 PERFORMANCE SPECIFICATIONS - Continued

**Shock and Vibration:**Complies with MIL-T-28800  
Class 3, Style E.**EMI:**Meets requirements of MIL-STD-461A  
for CS-01, CS-06 and RS-03 to  
400 MHz at 1 V/meter. There is  
no detectable radiated or conducted  
RF leakage from the instrument or  
the probe.**Safety:**

Meets conditions of MIL-T-28800, Class 3, Style E.

**Running Time Meter:**The instrument incorporates an internal 5000 hour running time meter. The unit is  
of the chemical type and does not use mercury.**Power:**A fused power selector safety switch and receptacle on the rear panel selects one  
of four ac operating voltage ranges.

90 to 110 V	(100 V)	48 to 420 Hz
108 to 132 V	(120 V)	48 to 420 Hz
198 to 242 V	(220 V)	48 to 420 Hz
216 to 264 V	(240 V)	48 to 420 Hz

Input Power: 10 VA maximum

With Option 05 - Internal rechargeable NI-CAD battery

Running Time: 8 hours

Rechargeable Time: 16 hours (20 hours maximum)

**Dimensions:**

Height:	(Case)	133 mm	(5.25")
	(Overall)	147 mm	(5.8")
Width:	(Case)	211 mm	(8.3")
	(Overall)	220 mm	(8.66")
Depth:	(Case)	280 mm	(11")
	(Overall)	305 mm	(12")

The case is all-aluminum with sturdy side extrusions, front and rear die castings  
and quick disconnect top and bottom covers. It includes a tilt bail and a side mounted  
carry handle.

Weight:	3 kg. (6.6 lbs)	Net
	5.2 kg. (11.5)	Shipping



TABLE 1-2

## AVAILABLE ACCESSORIES

MODEL	DESCRIPTION
1340A	100:1 Capacitive Divider Probe Adapter. Extends range to 300 V rms. Usable 35 kHz to 700 MHz.
2340A	Non-Loading Probe Adapter for N and BNC Connectors.
4340A	Probe Adapter, Spring Tip with Ground Clip (Freq. < 100 MHz).
5340A	Tee-Adapter for use with 50 ohm coaxial systems to 1.2 GHz. Type "N" Connectors.
6340A	50 $\Omega$ Terminating Adapter. 1 watt; adapts to BNC or N Connector. Usable beyond 600 MHz.
1610A	RF Comparator Control Unit.
16101A	RF Comparator, 10 mV to 3 V, 100 kHz to 1 GHz.
10755A	Carrying Case, Padded Soft Vinyl.
89-11103-1A	Storage Case for accessories.
800-06	Rack Mount (2 units) 5 $\frac{1}{4}$ inch high panel.
38-10037-1L	Half Rack Cover Plate for 800-06.
31-10189-0A	50 ohm Precision "N" Termination for use with 5340A Tee Adapter. VSWR 1.02 to 1.2 GHz.
34401A	Accessory Kit consisting of: 1 Model 1340A                      1 P/N 89-11103-1A 1 Model 2340A                      1 P/N 31-10189-0A 1 Model 5340A
31-10322-0A	Connector, 26 Conductor Ribbon Cable; for Remote Programming of Model 3440A with Serial Prefix 050- and above.
79-10111-0A	Cable, Ribbon; 26 conductors (specify length).