

Table 1-1. Specifications

**FREQUENCY MEASUREMENTS**

**Range:** 0 to 50 MHz (dc input). 25 Hz to 50 MHz (ac input, maximum sensitivity).

**Gate Time:** 1  $\mu$ sec to 10 seconds in decade steps.

**Accuracy:**  $\pm 1$  count  $\pm$  time base accuracy

**Reads In:** kHz or MHz with positioned decimal point; units annunciator in line with digital display.

**Self Check:** counts 10 MHz for the gate time chosen by the time base selector switch.

**SCALING**

**Frequency Range:** 0 to 50 MHz.

**Factor:** by decades up to  $10^9$ , switch selected on rear panel.

**Input:** front panel, Signal Input.

**Output:** in place of time base output frequencies.

**PERIOD AVERAGE MEASUREMENTS**

**Range:** Single Period 0 to 1 MHz  
Multiple Period 0 to 300 kHz

**Periods Averaged:** 1 period to  $10^5$  periods in decade steps.

**Accuracy:**  $\pm 1$  count  $\pm$  time base accuracy  $\pm$  trigger error.\*

**Frequency Counted:**

1 and 10 period 1 Hz to 10 MHz in decade steps  
100 period . . . . . 10 Hz to 10 MHz  
1,000 period . . . . . 100 Hz to 10 MHz  
10,000 period . . . . . 1 kHz to 10 MHz  
100,000 period . . . . . 10 kHz to 10 MHz

**Reads In:** sec, ms,  $\mu$ s, with positioned decimal point; units annunciator in line with digital display.

**Self Check:** Gate time is 10  $\mu$ s to 1 sec (periods averaged of 100 kHz); counts 100 kHz from the time base.

**RATIO MEASUREMENTS**

**Displays:**  $(f_1/f_2)$  times period multiplier.

**Range:**  $f_1$  - 0 to 50 MHz.  $f_2$  - 0 to 1 MHz in single period. 0 to 300 kHz in multiple period; periods averaged 1 to  $10^5$  in decade steps.

**Sensitivity:** 0.1 v rms, each input.

\*Trigger error is less than  $\pm 0.3\%$  of one period  $\div$  periods averaged for signals with 40db or better signal-to-noise ratio.

\*\* After 72 hours of continuous operation.

**Accuracy:**  $\pm 1$  count of  $f_1 \pm$  trigger error\* of  $f_2$ .  $f_1$  is frequency applied to the decimal counters (enters Time Base Ext. jack on front panel);  $f_2$  is frequency applied to decade dividers (enters Signal Input jack).

**Reads In:** Dimensionless; positioned decimal point for number of periods averaged.

**Self Check:** Period Average Self Check applies.

**TIME BASE**

**Frequency (internal):** 1 MHz.

**Stability:** Aging Rate - less than 3 parts in  $10^9$  per 24 hours. \*\* As a Function of Temperature: less than  $\pm 2$  parts in  $10^{10}/^\circ\text{C}$   $-20^\circ\text{C}$  to  $+55^\circ\text{C}$ . As a Function of Line Voltage: less than  $\pm 5$  parts in  $10^{10}$  for  $\pm 10\%$  change in line voltage from 115v or 230 v rms.

Short Term - less than 2 parts in  $10^{10}$  rms with measurement averaging time of one second under constant environmental and line voltage conditions.

**Adjustment:** Fine frequency adjustment (range approximately 4 parts in  $10^8$ ) and medium frequency adjustment (range approximately 1 part in  $10^6$ ) are available from the front panel through the plug-in hole. Coarse frequency adjustment (range approximately 1 part in  $10^5$ ) is available at the rear of the instrument.

**Output Frequencies:**

Rear Panel: 0.1 Hz to 10 MHz in decade steps; switch selected on rear panel; all frequencies available in manual function without interruption at reset except 100 Hz, 10 Hz, 1 Hz, and 0.1 Hz which are interrupted by manual reset; 10 kHz to 10 MHz available continuously in all functions; 1 kHz available continuously for all functions except 100K period average; stability same as internal time base; 5 volts p-p rectangular wave with 1000 ohm source impedance at 1 MHz and lower; 1 volt rms sine wave with 1000 ohm source impedance only at 10 MHz.

Front Panel: 0.1 Hz to 1 MHz in decade steps; selected by Time Base switch; availability as defined under Output Frequencies above; stability same as internal time base; 1 v p-to-p.

**External Standard Frequency:** 1 MHz, 1 volt, rms, into 1000 ohms required at rear panel BNC connector.

**GENERAL**

**Registration:** 8 digits in-line with rectangular Nixie<sup>®</sup> tubes and display storage; 99,999,999 maximum display; total width of 8 digit display including illuminated units annunciator and auto-positioned decimal point indication does not exceed 7 inches.

Table 1-1. Specifications (cont'd)

**GENERAL** (continued)

**Display Storage:** Holds reading between samples; switch overrides storage.

**Sample Rate:** Time following a gate closing during which the gate may not be reopened is continuously variable from less than 0.2 sec to 5 seconds in frequency mode, independent of gate time; display can be held indefinitely.

**Operating Temperature Range:**  $-20^{\circ}\text{C}$  to  $+65^{\circ}\text{C}$ .

**Connectors:** BNC type except for BCD output and power cable.

**Signal Input:**

Maximum Sensitivity - 100 mv rms.

Attenuation - Step attenuator provides ranges of 0.1, 1, and 10 volts rms.

Trigger Level Adjustment - Front panel control has  $\pm 0.3$  volt trigger level range on 0.1 volt position,  $\pm 3$  volt range on 1 volt position, and  $\pm 30$  volt range on 10 volt position. A preset position automatically centers trigger level at zero volts for all positions of attenuator.

Impedance - 1 megohm in parallel with approximately 25 pf, all ranges.

Coupling - ac or dc, separate BNC connectors. AC coupling has 600 vdc, 0.022  $\mu\text{f}$  capacitor ( $-3$  dB at approximately 7 Hz).

Overload Protection - Diode clamps protect input circuit for up to 120 volts rms on 0.1 volt range, 250 volts rms on 1 volt range, and 500 volts rms on 10 volt range. Input resistance under overload conditions (approximately ten times minimum sensitivity) will be greater than 100K ohms on 0.1 volt range, and approximately 1 megohm on other ranges.

**Time Base External Input (Front Panel):**

Maximum Sensitivity - 100 mv, rms.

Impedance - 10K ohms, approximately 40 pf. DC coupled.

Overload - Diode clamps protect input circuit for up to 50 volts, rms.

**Output:**

4-line BCD 1-2-2-4, "1" state positive. 4-line BCD 1-2-4-8, available as Option 02 ("1" state positive) and Option 03 ("1" state negative).

"0" State Level:  $-8\text{v}$ .

"1" State Level:  $+18\text{v}$ .

Impedance - 100K, each line.

**Reference Levels:**

Approximately  $+17\text{v}$ , 350 ohm source.

Approximately  $-6.5\text{v}$ , 1000 ohm source.

Output is suitable for systems use or output devices such as  $\odot$  Model 580A and 581A Digital-to-Analog Converters and includes the decimal point and measurement unit for  $\odot$  562A Digital Recorder.

Print Command -  $+13\text{v}$  to 0v step, dc-coupled.

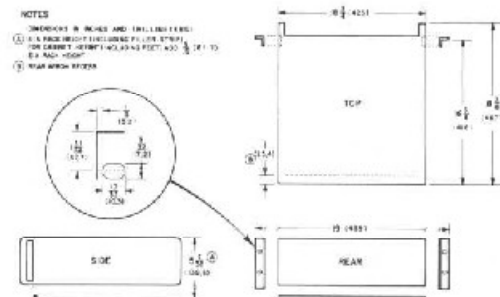
Cable Connector - Amphenol 50-pin 57-30500, 1 required.

**Hold-off Requirement** -  $+15\text{v}$  min.,  $+25\text{v}$  max. from chassis ground (1000 ohm source).

**Weight** - Net 32 lbs (14, 4 kg) with blank plug-in; shipping, 40 lbs (18, 2 kg).

**Power Supply** - 115 or 230 volts  $\pm 10\%$ , 50 to 60 Hz; 95 watts (50 to 1000 Hz operation, special order).

**Accessories Furnished** -  $\odot$  10503A Cable, 4 feet long, male BNC connectors. Detachable power cord, 7-1/2 ft (2040 mm) long, NEMA plug. Circuit Board Extender.

**Dimensions:****OPTIONAL AND SPECIAL FEATURES**

**Option 02:** 4-line BCD 1-2-4-8, "1" state positive in lieu of 1-2-2-4 (identical in other respects to above Output data) for digits only.

**Option 03:** 4-line BCD 1-2-4-8, "1" state negative in lieu of 1-2-2-4 (identical in other respects to above Output data) for digits only.

**Remote Operation:** All functions which may be programmed from the front panel controls (in normal use) may be programmed from a remote location except for the "Sample Rate" (as defined above) and the sensitivity control setting. The instrument provides (through rear panel connectors) all voltages necessary for remote control. The programming voltages for Time Base and Function control are low level,  $-15$  volts dc at 5 ma per gate. Control may also be achieved by using an external  $-15$  volt dc supply. The position of the decimal point and measurements unit may be correctly illuminated from the remote location, using  $+170$  volts dc from the internal or an external supply.

Cable Connector: Amphenol 36-pin 57-30360, 2 required.