B Specifications and Characteristics

Specifications

Clock Sources (HP 16520A Only)	**Internal Clock**	
	Clock Period	programmable from 20 ns to 200 μs in a one-two-five sequence.
	Data Period Accuracy	± 2% (of period) ±1 ns
	External Clock (provided by user)	
	Input Clock Period	1 Hz to 50 MHz (20 ns min period) ECL or TTL, internal frequency divide (/1, /5, or /10) provided
	Duty Cycle	10 ns minimum high time 10 ns minimum low time
Strobes (HP 16520A Only)	**Number of Strobes**	3 (ECL or TTL)
	Bits/Channel	4095
	Maximum Bit Rate	20 MBit/s (50 ns period)
	Edge Placement	≤ 10 MBit/s: tenths of period > 10 MBit/s to 20 MBits/s: fifths of period (DELAY + WIDTH ≤ PERIOD)
	Minimum Delay	0/10 (0/5), maximum delay is 9/10 (4/5) data period
	Minimum Width	1/10 (1/5) of data period, maximum width is the data period (values in parentheses apply to 10 MBit/s timbase setting). If strobes are desired while operating with external clock, the data rate will be divided to 1/5 or 1/10 the external clock rate.

Characteristics

Eight channel pods can be assigned as either standard ECL or TTL levels. All characteristics are valid at the probe tip.

Output

	ECL	TTL
V_{OH} (steady state)	-0.98 V	2.7 V
V_{OL} (steady state)	-1.55 V (into 10kΩ, 10 pF)	0.6 V (into 10 kΩ, 10 pF)
Risetime/ falltime (typ)	2.3 ns (-0.98 V to -1.55V)	2.5 ns (0.6 V to 2.7V)
Channel-to-channel skew* (same card)	≤5 ns	≤5 ns
Channel-to-channel skew* (card-to-card)	< 10 ns	< 10 ns
Number of std loads	3 (10 KH ECL, @ V_{nh} = 150 mV)	3 (LS, @ V_{nl} = 250 mV)

(Output measurements made into a load consisting of 10 kΩ in series shunted with 10 pF to ground.)

(*) Skew measured at (+1.6 V) TTL and (-1.3 V) ECL levels.

Data Capacity

	16520A	16521A
Number of channels	12	48
Bits per channel	4095	4095
Maximum bit rate	50 MBit/s NRZ (20 ns period)	50 MBit/s NRZ (20 ns period)

Input		**ECL**	**TTL**
	V_{IH} (min)	-0.91 V	2.08 V
	V_{IL} (max)	-1.69 V	1.12 V
	Maximum input voltage	±40 V	
	Input impedance	100 kΩ, 8 pF	
	External clock-in to clock-out delay	50 ns	
Editing Functions	**Program Listing**	DELETE, MERGE, COPY, INSERT	
Listing Bases		Binary, octal, decimal, hexadecimal, and symbol	
Step Mode		Single-step program execution in 1 to 999 program line steps, from a break.	
Data Instruction Set	**Break**	Stops program execution, last data vector is held at output.	
	Repeat	Repeats vector up to 256 times.	
	Wait IMB	Wait for intermodule trigger	
	Wait External	Wait for user-defined 3-bit patern on external input pod to become true. No data cycle latency when pattern is true between 30 ns and 0 ns before next clock edge.	
	Signal IMB	Arms other measurement cards.	
	Macro	Four different macros may be defined and inserted as needed. A six character name may be defined for each macro. Macros may contain	

		REPEAT, WAIT EXTERNAL, WAIT IMB, BREAK AND SIGNAL IMB instructions.
Operating Environment	**Temperature**	Instrument, 0° to 55° C (+32° to 131 ° F). Probe lead sets and cables, 0° to 65° C (+32° to 149° F).
	Humidity	Instrument, up to 95% relative humidity at 40° C (104° F).
	Altitude	To 4600 m (15,000 ft).
	Vibration	
	Operating	Random vibration 5-500 Hz, 10 minutes per axis, ~0.3 g (rms)
	Non-operating	Random vibration 5-500 Hz, 10 minutes per axis, ~2.41 g (rms); and swept sine resonant search, 5-500 Hz, 0.75 g (0-peak), 5 minute resonant dwell @ 4 resonances per axis.