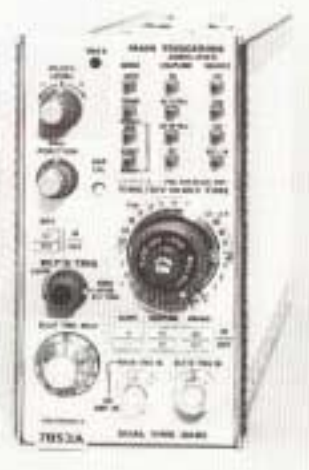


## 7000-SERIES OSCILLOSCOPES

### 7B53A and 7B53AN Dual Time Bases



- 5 ns/DIV to 5 s/DIV CALIBRATED TIME BASE
- CALIBRATED MIXED SWEEP
- TRIGGERING to 100 MHz
- SINGLE-SWEEP OPERATION
- OPTIONAL TV SYNC-SEPARATOR TRIGGERING



The 7B53A and 7B53AN Dual Time Bases are recommended for use with the 7400, 7500, 7600 and Storage FAMILIES to provide bandwidth/sweep speed compatibility. Both time bases have identical characteristics except the 7B53AN does not incorporate CRT READOUT.

These Dual Time Bases feature four sweep display modes: normal, intensified delaying, delayed and mixed.

Normal Sweep (nondelayed) is selected when the DLY'D TIME/DIV switch is pushed in and set to the same sweep rate as the TIME/DIV switch. The switches will latch in this mode.

Intensified Delaying Sweep is accomplished by pulling out the DELAYED SWEEP TIME/DIV knob. The delaying (main) sweep is intensified for a period of time determined by the delayed sweep setting. The intensified zone may be initiated at any point on the delaying sweep determined by the DELAY TIME MULT (DTM). The DELAYING and DELAYED TIME/DIV controls can be independently set. MAIN TRIGGERING controls are used to control the delaying sweep.

Delayed Sweep is selected by pushing in the DELAYED SWEEP TIME/DIV knob. The intensified segment of the delaying sweep is now displayed over the full 10 div of the CRT. The delayed sweep may be operated in either a "triggered" or "runs-after-delay" mode.

Mixed Sweep is accomplished by pulling the VARIABLE knob out, combining the slower and faster sweep speeds into one display. The main sweep is displayed at the slower speed from the sweep start to a selectable point on the main sweep. Past this point, the sweep is displayed at the faster of the two sweep speeds. The intensified zone, delayed sweep and mixed sweep may be initiated at any point on the main sweep determined by the DLY TIME MULT.

### TV SYNC

**Option 5, TV Sync Separator Triggering**—Permits stable internal Line or Field rate triggering from displayed composite video or composite sync waveforms. Conventional waveform displays and measurements can be made from standard broadcast or closed-circuit TV systems, domestic or overseas, with up to 1201-line, 60-Hz field rates. Individual lines can be displayed with the delayed sweep features. The wide range of delayed sweeps permits accurate alternate-frame color-burst observations in the PAL color system.

### DELAYING SWEEP

**Sweep Rate**—0.05  $\mu$ s/div to 5 s/div in 25 steps (1-2-5 sequence). 5 ns/div is the fastest calibrated sweep rate, obtained with the X10 MAGNIFIER. The uncalibrated VARIABLE is continuous between steps and to 12.5 s/div. The variable control is internally switchable between main, delayed sweep and variable main sweep holdoff.

**Sweep Accuracy**—Measured over the center 8 div.

TIME/DIV	UNMAGNIFIED		MAGNIFIED	
	+15°C to +35°C	0°C to +50°C	+15°C to +35°C	0°C to +50°C
5 s/div to 0.1 s/div and 0.2 $\mu$ s/div to 0.05 $\mu$ s/div	3%	4%	3.5%	5%
50 ms/div to 0.5 $\mu$ s/div	2%	3%	2.5%	4%

**Delay Time Multiplier Range**—0 to 10 times the DELAY TIME/DIV setting from 5 s/div to 1  $\mu$ s/div.

**Differential Delay Time Measurement Accuracy**—5 s/div to 1 s/div:  $\pm(1.4\%$  of measurement  $+ 0.3\%$  of full scale); 0.5 s/div to 1  $\mu$ s/div:  $\pm(0.7\%$  of measurement  $+ 0.3\%$  of full scale). Full scale is 10 times the DELAY TIME/DIV setting. Accuracy applies over the center 8 major DTM divisions from +15°C to +35°C.

**Jitter**—1 part or less in 20,000 of X10 the TIME/DIV setting.

### Triggering

COUPLING	TRIGGERING FREQUENCY RANGE	MIN SIGNAL REQUIRED	
		INT	EXT
AC	30 Hz - 10 MHz 10 MHz - 100 MHz	0.3 div	100 mV
		1.5 div	500 mV
AC LF REJ*	30 kHz - 10 MHz 150 kHz - 10 MHz 10 MHz - 100 MHz	0.3 div	100 mV
		1.5 div	500 mV
AC HF REJ	30 Hz - 50 kHz	0.3 div	100 mV
DC	DC - 10 MHz 10 MHz - 100 MHz	0.3 div	100 mV
		1.5 div	500 mV

\*Will not trigger on sinewaves of 3 div or less INT or 1.5 V EXT below 120 Hz.

**Single Sweep**—Triggering requirements are the same as normal sweep. When triggered, sweep generator produces one sweep only until manually or remotely reset.

**Internal Trigger Jitter**—1 ns or less at 75 MHz.

**External Trigger Input**—Max input voltage is 500 V (DC  $\pm$  peak AC). 500 V P-P AC at 1 kHz or less. Input R and C is 1 M $\Omega$  within 2%, 20 pF within 2 pF. LEVEL range is at least +1.5 V to -1.5 V in EXT, at least +15 V to -15 V in EXT  $\div$  10.

### DELAYED SWEEP

**Sweep Rate**—0.05  $\mu$ s/div to 0.5 s/div in 22 steps (1-2-5 sequence). 5 ns/div is the fastest calibrated sweep rate, obtained with the X10 MAGNIFIER. The uncalibrated VARIABLE is continuous between steps to at least 1.25 s/div and is switchable between the main, delayed sweep and variable main sweep holdoff.



# 7000-SERIES OSCILLOSCOPES

## Dual Time Bases 7B53A and 7B53AN

**Sweep Accuracy**—Measured over the center 8 div.

TIME/DIV	UNMAGNIFIED		MAGNIFIED	
	+15°C to +35°C	0°C to +50°C	+15°C to +35°C	0°C to +50°C
0.5 s/div to 0.1 s/div and 0.2 μs/div to 0.05 μs/div	4%	5%	4.5%	6%
50 ms/div to 0.5 μs/div	3%	4%	3.5%	5%

**Delayed Sweep Gate**—Output voltage is approximately  $\pm 3.5$  V into at least  $10\text{ k}\Omega$  shunted by  $100\text{ pF}$  or less, or  $0.5$  V into  $50\ \Omega$ . Risettime is  $50\text{ ns}$  or less, output R is  $350\ \Omega$  within 10%. Gate is available at the DLY'D TRIG IN connector when the delayed sweep source switch is set to INT.

### Triggering

COUPLING	TRIGGERING FREQUENCY RANGE	MIN SIGNAL REQUIRED	
		INT	EXT
AC	30 Hz - 10 MHz 10 MHz - 100 MHz	0.3 div 1.5 div	100 mV 500 mV
DC	DC - 10 MHz 10 MHz - 100 MHz	0.3 div 1.5 div	100 mV 500 mV

**Internal Trigger Jitter**—  $1\text{ ns}$  or less at  $75\text{ MHz}$ .

**External Trigger Input**—Max input voltage is  $500\text{ V}$  (DC + peak AC),  $500\text{ V}$  P-P AC at  $1\text{ kHz}$  or less. Input R and C is  $1\text{ M}\Omega$  within 2%,  $20\text{ pF}$  within 2 pF. LEVEL range is at least  $\pm 1.5\text{ V}$  to  $-1.5\text{ V}$  in EXT.

### MIXED SWEEP

**Sweep Accuracy**—Within 2% plus measured MAIN sweep error. Exclude the following portions of MIXED Sweep: First 0.5 div after start of MAIN sweep display and  $0.2\text{ div}$  or  $0.1\ \mu\text{s}$  (whichever is greater) after transition of MAIN to DELAYED sweep.

### EXT HORIZONTAL INPUT

**Deflection Factor**—  $10\text{ mV/div}$  within 10% when in EXT, MAG X10;  $100\text{ mV/div}$  within 10% when in EXT;  $1\text{ V/div}$  within 10% when in EXT  $\div 10$ .

### Bandwidth

COUPLING	LOWER -3 dB	UPPER -3 dB
AC	40 Hz	2 MHz
AC LF REJ	16 kHz	2 MHz
AC HF REJ	40 Hz	100 kHz
DC	DC	2 MHz

Order 7B53A TIME BASE

Order 7B53AN TIME BASE

### 7B53A/AN OPTION

Order Option 5 TV TRIGGERING