

7B53A and 7B53AN Dual Time Bases

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 +3.5 V into at least 10 kΩ shunted by 100 pF or less, or 0.5 V into 50 Ω. Risettime is 50 ns or less, output R is 350 Ω 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	0.3 div	100 mV
	10 MHz - 100 MHz	1.5 div	500 mV
Dc	Dc - 10 MHz	0.3 div	100 mV
	10 MHz - 100 MHz	1.5 div	500 mV

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

External Trigger Input—Max input voltage is 500 V (dc + peak ac), 500 V p-p ac at 1 kHz or less. Input R and C is 1 MΩ within 2%, 20 pF within 2 pF. LEVEL range is at least +1.5 V to -1.5 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 div or 0.1 μs (whichever is greater) after transition of MAIN to DELAYED sweep.

EXT HORIZONTAL INPUT

Deflection Factor—10 mV/div within 10% when in EXT, MAG X10; 100 mV/div within 10% when in EXT; 1 V/div within 10% when in EXT ÷ 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 Dual Time Base \$850

Order 7B53AN Dual Time Base \$750

7B53A/AN OPTION

Order Option 5 TV Triggering Add \$60

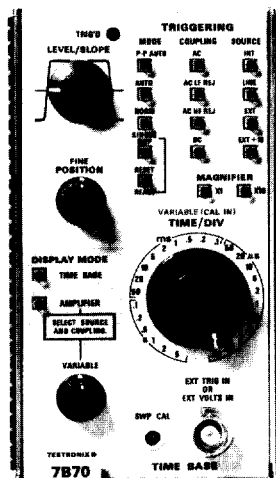
7B70

7000-Series Oscilloscopes

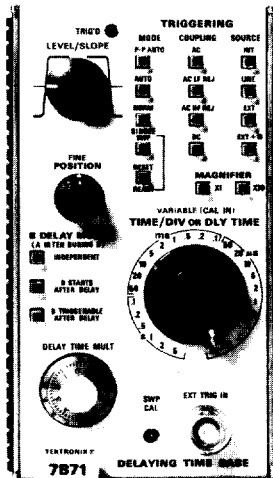
7B71

Delayed and Delaying Time Bases

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7B70



7B71

FEATURES OF BOTH TIME BASES

2 ns/Div to 5 s/Div
Calibrated Time Base

Triggering to 200 MHz

Peak-to-Peak Auto
Triggering

Single-Sweep Operation

The 7B70 and 7B71 are horizontal TIME-BASE units intended primarily for use with the 7700- and 7800-Series mainframes to provide bandwidth/sweep speed compatibility. However, the 7B70 and 7B71 may be used with any 7000-Series mainframe. They are identical units except in two particulars. In combination, they provide a delaying-sweep mode of operation; the 7B71 being the DELAYING SWEEP and the 7B70 the DELAYED SWEEP. The 7B70 also has a horizontal amplifier input for uncalibrated X-axis deflection from an external source.

7B70 and 7B71 Delayed and Delaying Time Bases

The calibrated TIME/DIV range is from 2 ns/div to 5 s/div. The 2 ns/div rate, obtained with the X10 MAGNIFIER, complements the risetime capability of the 7700-FAMILY vertical systems.

Triggering control is very flexible with 12 push-button positions to program MODE, method of COUPLING, and SOURCE. For routine applications, hands-off triggering is accomplished by actuating the three uppermost push-button switches: INT source, AC COUPLING, and P-P AUTO MODE which is the most generally used combination. The P-P AUTO MODE provides a baseline trace in the absence of a signal and a triggered trace at any position of the LEVEL/SLOPE control when a signal of 0.5 div or greater is present. Except for the selection of + or - SLOPE this mode is completely automatic. The other triggering positions are useful for specific applications.

The triggering frequency range is from dc to 200 MHz, selectable within that range by the method of COUPLING. Ac Lf Rej attenuates undesirable trigger components below 30 kHz (60 Hz would be almost totally rejected); Ac Hf Rej attenuates high-frequency components (above 50 kHz) which can cause triggering problems during low-frequency applications. SINGLE-SWEEP functions with lighted READY indicators and manual reset are associated with the trigger MODE controls.

For delaying-sweep operation, the 7B71 (occupying the A horizontal channel) contains the DELAY TIME MULTIPLIER and control circuitry to release the 7B70 DELAYED SWEEP (B horizontal channel) at a predetermined point during the delaying sweep. After release, the delayed sweep can be programmed to begin immediately or wait for the next trigger event.

Both units can be used singly in all 7000-Series mainframes, or in combination to add the delaying-sweep function. Independent dual-sweep operation is possible only in mainframes with two horizontal plug-in compartments using CHOP or ALT modes.

Characteristics are common to both units unless otherwise noted.

Sweep Rate—0.02 μ s/div to 5 s/div in 26 steps (1-2-5 sequence). 2 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.

Sweep Accuracy—Measured over the center 8 div, with the 7704A mainframe.

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 μ s/div to 0.02 μ s/div	3%	4%	3.5%	5%
50 ns/div to 0.5 μ s/div	2%	3%	2.5%	4%

DELAYING SWEEP CHARACTERISTICS (7B71 ONLY)
Delay Time Multiplier Range—0 to 10 times the TIME/DIV setting from 5 s/div to 1 μ s/div.

Differential Delay Time Measurement Accuracy—5 s/div to 1 s/div: \pm (1.5% of measurement + 0.3% of full scale); 0.5 s/div to 1 μ s/div: \pm (1% 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 50,000 of X10 the TIME/DIV setting.

TRIGGERING

Coupling	Triggering	Min Signal Required	
	Frequency Range	Int	Ext
Ac	30 Hz - 20 MHz	0.3 div	75 mV
	20 MHz - 200 MHz	1.5 div	375 mV
Ac Lf Rej*	30 kHz - 20 MHz 20 MHz - 200 MHz	0.3 div 1.5 div	75 mV 375 mV
Ac Hf Rej	30 Hz - 50 kHz	0.3 div	75 mV
Dc	Dc - 20 MHz	0.3 div	75 mV
	20 MHz - 200 MHz	1.5 div	375 mV

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

P-P Auto Operation—0.5 div INT, 125 mV EXT from 200 Hz to 20 MHz; 1.5 div INT, 375 mV EXT from 20 MHz to 200 MHz.

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 150 MHz.

Ext Trigger Input—Max input voltage is 500 V (dc + peak ac), 500 V (p-p ac) at 1 kHz or less. Input R and C is 1 M Ω within 2%, 20 pF within 2 pF. The level range (excluding P-P AUTO) is at least +1.5 V to -1.5 V in EXT; at least +15 V to -15 V in EXT \div 10.

EXT HORIZONTAL INPUT (7B70 ONLY)

Deflection Factor—Minimum deflection factor is 25 mV/div within 5 mV/div when in EXT source with variable fully CW; minimum deflection factor is 250 mV/div within 50 mV/div when in EXT \div 10 source with variable fully CW. The VARIABLE is continuous between steps and to at least 2.5 V.

Frequency Response (measured in 7700-FAMILY mainframes)

Coupling	Lower -3 dB	Upper -3 dB
Ac, Ac Lf Rej, Ac Hf Rej	10 Hz	200 kHz
Dc	Dc	200 kHz

Order 7B70 Time Base \$675

Order 7B71 Delaying Time Base \$775