



### DESCRIPTION

The 7B71 and 7B70 are horizontal TIME-BASE units intended primarily for use with the 7704 mainframe to provide bandwidth/sweep speed compatibility. However, the 7B71 and 7B70 may be used in 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.

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 2.4 ns risetime capability of the 7704 vertical system.

Triggering control is very flexible with 12 push-button positions to program MODE, method of COUPLING, and SOURCE. For routine applications, hand-off triggering is accomplished by actuating the three upper-most push-button switches: INT source, AC COUPLING, and P-P AUTO MODE which is the most generally used combination. The new 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. Ex-

cept 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 the 7704, or in combination to add the delaying-sweep function and independent dual-sweep operation possible in the horizontal amplifier CHOPPED or ALT modes.

## SPECIFICATIONS

Specifications are common to both units unless otherwise noted.

## SWEEP RATE

0.02  $\mu$ 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  $\approx$  12.5 s/div.

## SWEEP ACCURACY

Measured over the center 8 div, with the 7704 main-frame calibrator.

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 to 1 s/div	3%	4%	3.5%	5%
0.5 s to 0.05 $\mu$ s/div	2%	3%	2.5%	4%

## SWEEP LENGTH

10.5 div to 13 div.

## SWEEP HOLD-OFF TIME

5 s to 5  $\mu$ s/div—1.5X the TIME/DIV setting or less.  
2  $\mu$ s to 0.02  $\mu$ s/div—3.5  $\mu$ s or less.

## TRIGGERING

COUPLING	Triggering Frequency Range	Min. Signal Required	
		INT	EXT
AC	30 Hz - 20 MHz 20 MHz - 200 MHz	0.3 div 1.5 div	75 mV 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 20 MHz - 200 MHz	0.3 div 1.5 div	75 mV 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—500 V (DC + peak AC of 1 kHz or less).

Input R and C—1 M $\Omega$  within 2%, 20 pF within 2 pF.

Level range (excluding P-P AUTO)

EXT—at least +1.5 V to -1.5 V.

EXT  $\times$  10—at least +15 V to -15 V.

## EXT HORIZONTAL INPUT (7B70 ONLY)

**DEFLECTION FACTOR**—25 mV/div within 5 mV when in EXT source with variable fully CW; 250 mV/div within 50 mV/div when in EXT  $\times$  10 source position. The VARIABLE range is at least 10:1.

## FREQUENCY RESPONSE:

COUPLING	Lower -3 dB	Upper -3 dB
AC	16 Hz	100 kHz
AC LF REJ	16 kHz	100 kHz
AC HF REJ	16 Hz	100 kHz
DC	DC	100 kHz

## DELAYING SWEEP CHARACTERISTICS

(7B71 ONLY)

**DELAY TIME MULTIPLIER RANGE**—0 to 10 times the TIME/DIV setting.

**ACCURACY**—5 s/div to 1 s/div within 2%.  
0.5 s/div to 1  $\mu$ s/div within 1%.

**MULTIPLIER INCREMENTAL LINEARITY**—within 0.2%.

## DIFFERENTIAL TIME MEASUREMENT ACCURACY

Within 1% and 2 minor DIV—1  $\mu$ s to 0.5 s.  
Within 2% and 2 minor DIV—1 s to 5 s.

**JITTER**—1 part or less in 50,000 of 10X the TIME/DIV setting.

## INCLUDED STANDARD ACCESSORIES

Two instruction manuals 7B70, (070-0982-00).  
Two instruction manuals 7B71, (070-0983-00).

Please refer to Terms and Shipment, General Information page.