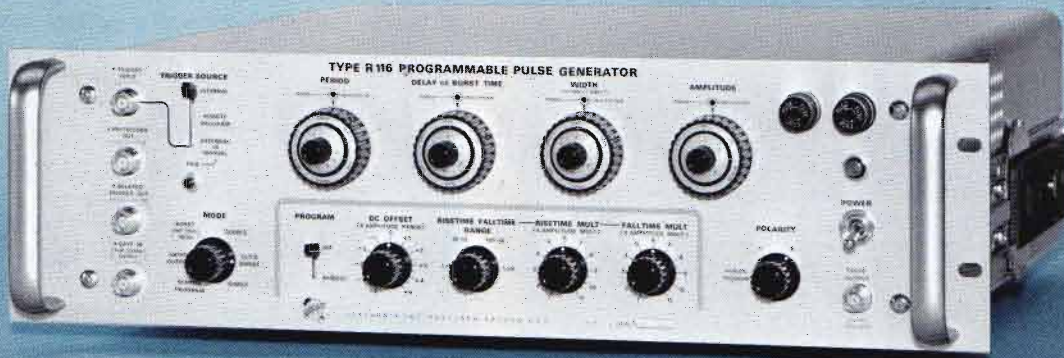


# TYPE R116

## PROGRAMMABLE PULSE GENERATOR



### CALIBRATED AND PROGRAMMABLE PARAMETERS

- **MODE**
- **TRIGGER SOURCE**
- **PERIOD**
- **DELAY OR BURST TIME**
- **WIDTH**
- **POLARITY**
- **AMPLITUDE**
- **DC OFFSET**
- **RISETIME AND FALLTIME**

The Type R116 is a broad-range, programmable pulse generator intended primarily for applications where various combinations of pulse amplitude, width, polarity, and other features are required in rapid sequence.

All functions and parameters are easily programmable with no need for extra-cost modifications. The Type R116 can also be operated manually from calibrated front-panel controls for initial test setup and for applications not requiring external programming. Full programming capability requires 21 bits and 7 analog lines.

### PULSE CHARACTERISTICS (at 10-volts amplitude)

CHARACTERISTICS	RANGE	BASIC ACCURACY (% of dial)	REQUIRED PER PROGRAM
*RISETIME AND FALLTIME	10 ns to 110 $\mu$ s	$\pm 5\%$ (except $\pm 10\%$ on 1 and 10 ns range. <10 ns uncalibrated.)	3 bits + 2 resistors
*PERIOD	100 ns to 11 ms	$\pm 3\%$ , except shortest period range is $\pm 5\%$	4 bits + 1 resistor
*WIDTH	50 ns to 550 $\mu$ s	$\pm 3\%$ , except shortest width is $\pm 5\%$	3 bits + 1 resistor
*DELAY OR BURST TIME	50 ns to 550 $\mu$ s	$\pm 3\%$ +10 ns	3 bits + 1 resistor
*AMPLITUDE (into 50 $\Omega$ )	0.4 V to 10 V	$\pm 3\%$ all ranges	2 bits + 1 resistor
*DC OFFSET (continuous)	-5 V to +5 V	$\pm 5\%$ $\pm 100$ mV	1 resistor
POLARITY	positive or negative		1 bit

\*These parameters are calibrated and continuously variable.

## PROGRAM ACCURACY

Accuracy of the remote program when using recommended program resistor values is the same as the corresponding front-panel control plus 2%, plus any error in the value of the program resistor. For example, the period which has a basic accuracy of  $\pm 3\%$  from the front panel would have a maximum error of  $\pm 5\%$ , plus the error in the programming resistor when it is remotely programmed. Accuracy of remote programming may be improved by calibrating the instrument for remote programming rather than for front-panel operation.

## OPERATING MODES

### SINGLE

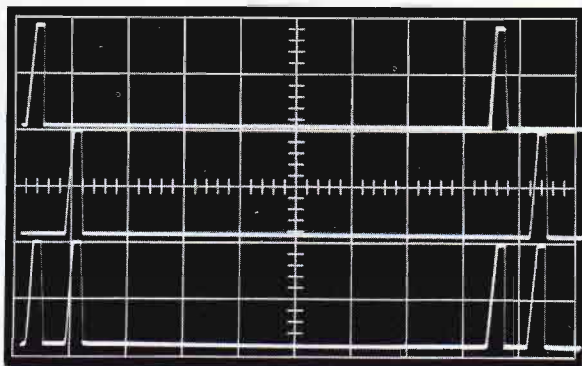
Undelayed pulses.

### DELAYED SINGLE

Pulses occurring at the end of the delay time.

### DOUBLE

Pairs of pulses: one occurring at the time of the normal undelayed pulse, one occurring at the end of the delay time. 50-ns minimum pulse separation.



Multiple exposure showing timing relationships between Single, Delayed Single, and Double operating modes. Oscilloscope triggered from Type R116 Pretrigger. 50  $\mu\text{s}/\text{cm}$  sweep time, 5 V/cm deflection factor.

### BURST

Output pulses obtained for the duration of Burst Time when initiated by external triggering pulse. Pulses occur at internal repetition rate.

### GATED OUTPUT

Output pulses obtained for the duration of input gate. Pulses are synchronous with input gate and occur at internal repetition rate.

### REMOTE PROGRAM

Permits remote programming of the operating mode. Programming requires 4 bits.

## INPUTS

### + TRIGGER

Accepts trigger from +2 V to +20 V, for triggering signals having at least 100 ns separation; +2 V to +4 V for signals having at least 50 ns separation. DC-coupled input.

### + GATE

Accepts gate from +2 V to +10 V. Output pulses start approximately 100 ns after gate reaches +2-V level and continue until gate drops below +2 V. Output pulses synchronous with gate. DC-coupled input.

## AUXILIARY OUTPUTS

### + PRETRIGGER

2 V minimum into 1 k $\Omega$ , risetime less than 20 ns. Occurs approx 30 ns prior to start of the undelayed output pulse.

### + DELAYED TRIGGER

2 V minimum into 1 k $\Omega$ , risetime less than 20 ns. Occurs approx 30 ns prior to the start of the delayed output pulse.

## OTHER CHARACTERISTICS

### POWER REQUIREMENTS

94.5 to 137.5 V or 189 to 275 V, selectable by rear-panel switch. 50 to 60 Hz, 100 watts maximum.

### DIMENSIONS AND WEIGHTS

Height	5 $\frac{1}{4}$ in	13.3 cm
Width	19 in	48.3 cm
Depth	17 $\frac{1}{2}$ in	44.5 cm
Net weight	25 $\frac{3}{4}$ lb	11.7 kg
Domestic shipping weight	$\approx 61$ lb	$\approx 27.7$ kg
Export-packed weight	$\approx 86$ lb	$\approx 39.1$ kg

### INCLUDED STANDARD ACCESSORIES

30-in 50- $\Omega$  BNC cable (012-0057-01); 50- $\Omega$  BNC termination (011-0049-00); 36-pin remote program connector (131-0293-00); set mounting tracks (351-0084-00); set mounting hardware, cabinet feet kit (016-0052-00); 3-conductor power cord (161-0024-01); 3 to 2-wire adapter (103-0013-00); two instruction manuals (070-0498-00).

## OPTIONAL ACCESSORIES

Optional accessories increase measurement capability and provide added convenience. See catalog accessory pages for additional information.

### CIRCUIT BOARD EXTENSION

Permits mounting of circuit boards away from surrounding circuitry for convenient servicing.

Order 012-0078-00

Please refer to Terms and Shipment, General Information Page.