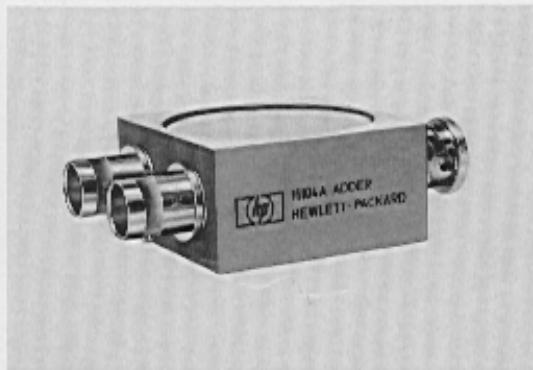
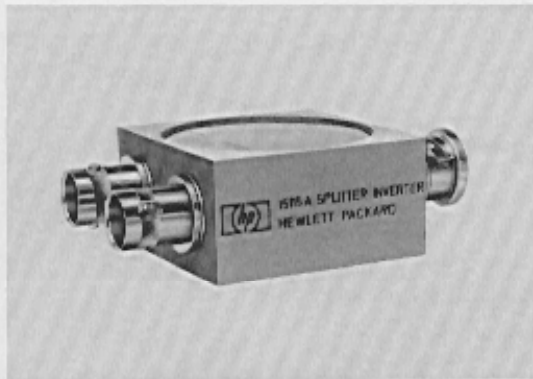


# model 15104A 15115A 15116A



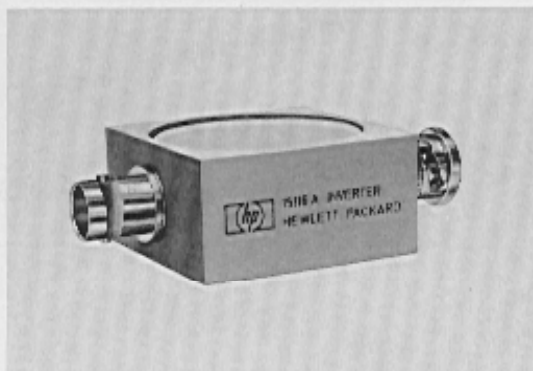
## ADDER

The Model 15104A can be used to combine the outputs of two generators, or by using two or more adders, the outputs of three or more generators. Adders can also be used as splitters when it is desired to drive two or more loads from a single source. Any one (or two) of the three BNC connectors can be used as inputs, the remaining two (or one) serving as outputs.



## SPLITTER INVERTER

The Model 15115A converts a single input pulse into two pulses of opposite polarity. Thus, push-pull stages and flip-flops can be driven easily by a single pulse source. Input pulses may be of either polarity and up to 500ns in width. For each input pulse applied to the BNC plug, there appears at the NORMAL output jack, a pulse of the same polarity attenuated 6.0dB and at the INVERTED output a pulse of opposite polarity attenuated 6.2dB.



## INVERTER

The Model 15116A is designed for fast rise time pulses with up to 500ns width. The Inverter converts incoming pulses to pulses of opposite polarity. Input pulses may be either positive or negative and either of the connectors may be used as an input the other serving as an output.

## GENERAL

The passive signal handling devices are designed for use with Hewlett-Packard pulse generators in a 50Ω matched system. Because of their fast rise time and good 50Ω characteristics, they introduce little distortion.

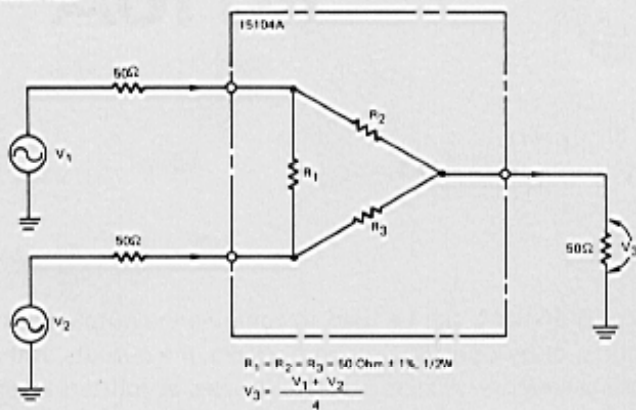
**ADDER 15104A**

**Reflection:** 10% in a 50Ω, 150-picosecond pulse system (DC to over 2GHz equivalent bandwidth).

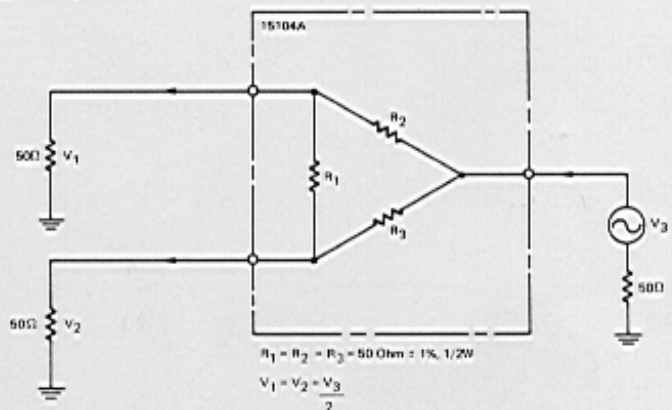
**Rise Time:** < 150 picoseconds

**Max. Input:** 2W into two inputs with the third terminated in 50Ω. Maximum average voltage not to exceed 5V between any two terminals.

Application: Adder



Application: Splitter



**SPLITTER INVERTER 15115A**

**Reflection:** 10% in a 50Ω, 150-picoseconds pulse system.

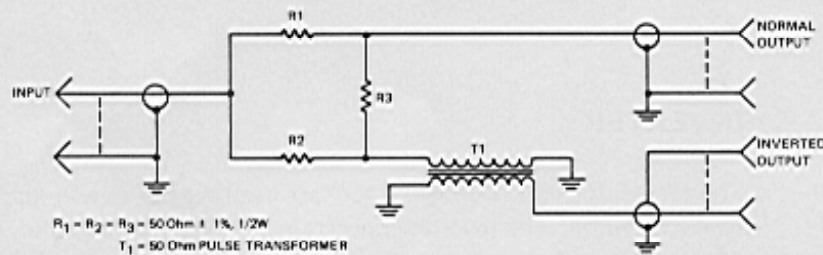
**Rise Time:** < 250 picoseconds non-inverted output, < 500 picoseconds inverted output.

**Droop at 500ns Pulse Width:** < 2.5% non-inverted output, < 4% inverted output.

**Max. Input:** 0.75W

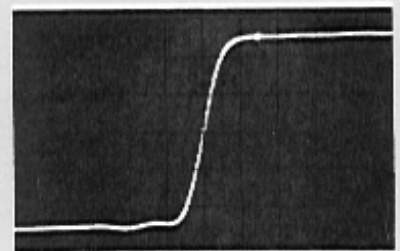
**Insertion Loss:** 6.0dB non-inverted output, 6.2dB inverted output.

**Delay between inverted and non-inverted output:** < 1ns



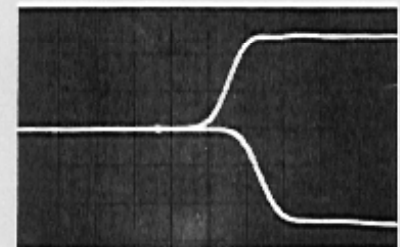
Typical Input

Vertical: 200mV/cm  
Horizontal: 1ns/cm



Typical Outputs

Vertical: 200mV/cm  
Horizontal: 1ns/cm



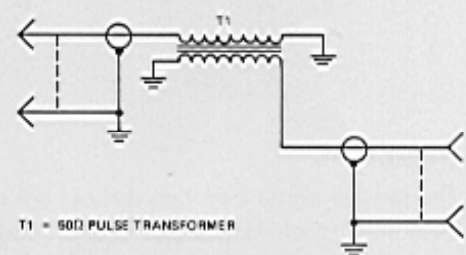
**INVERTER 15116A**

**Reflection:** 10% in a 50Ω, 150-picoseconds pulse system.

**Rise Time:** < 500 picoseconds

**Droop at 500ns Pulse Width:** < 5%

**Insertion Loss:** 0.3dB



For more information, call your local HP sales office listed in the telephone directory white pages. Ask for the electronic Instruments Department or write to Hewlett-Packard: U.S.A.-P.O. Box 10301, Palo Alto, CA 94303-0890. Europe/Middle East/Africa-Central Mailing Department, P.O. Box 529, 1180 AM Amstelveen, the Netherlands. Canada - 6877 Goreway Drive, Mississauga, L4V 1M8, Ontario. Japan-Yokagawa-Hewlett-Packard Ltd., 3-29-21, Takaide-Higashi, Suginami-ku, Tokyo 168. Elsewhere in the world, write to Hewlett-Packard Intercontinental, 3495 Deer Creek Road, Palo Alto, CA 94304.