

# Phillips Scientific

## Octal Variable Gain Amplifier

## NIM MODEL 777

### FEATURES

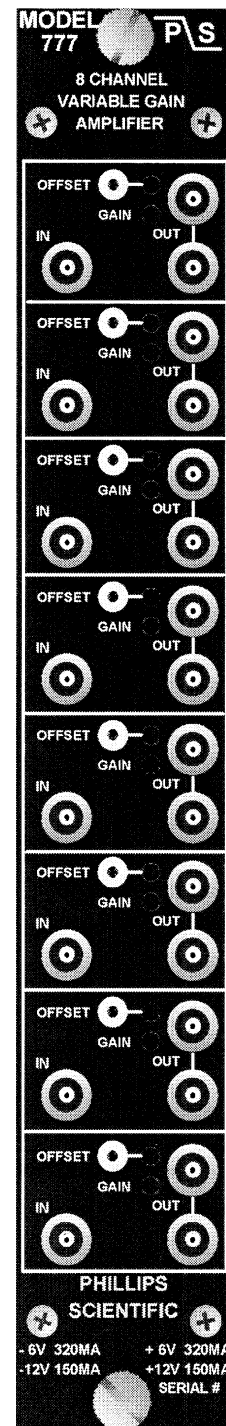
- \* Voltage Gains Variable from 2 to 50
- \* Eight Channels in a Single Width NIM
- \* Wideband Performance - DC to 200 MHz
- \* Excellent DC and Gain Stability
- \* Low Noise / Less than 25  $\mu\text{V}$  RMS
- \* All Inputs and Outputs Protected
- \* Individual Gain and Offset Controls

### DESCRIPTION

The Model 777 is a high performance variable gain preamplifier with eight independent channels packaged in a single width NIM module. The wide bandwidth from DC to over 200 MHz is maintained regardless of the gain setting and is designed to be used with photomultiplier detectors producing negative output pulses. Each channel provides a non-inverting voltage gain from 2 to 50, variable with a 15-turn potentiometer, a DC offset control and two outputs capable of driving 50 ohms each.

Excellent stability at both DC and higher frequencies allows for cascading of channels to achieve gains in excess of 500, while maintaining pulse fidelity without significant overshoot or baseline drift. The DC offset control can easily compensate for offsets due to variations in source impedance or differences in signal grounding.

The output stage is a low impedance voltage source design with short circuit protection. No damage can occur from overloading or continuous shorts to ground. The outputs are capable of driving two 50 ohm loads for fan out of the amplified signal. However, unused outputs may be left unterminated with no adverse effects.



**Phillips Scientific**

"A THEORY DEVELOPMENT COMPANY"

31 Industrial Ave. \* Mahwah, NJ 07430 \* (201) 934-8015 \* Fax (201) 934-8269

## INPUT CHARACTERISTICS

### General:

One LEMO input connector; 50 ohms  $\pm 2\%$  Direct Coupled; less than  $\pm 4\%$  input reflection for a 2.0nSec input risetime. Input protection clamps at  $\pm 7V$  and can withstand  $\pm 2$  Amps, ( $\pm 100$ Volts) for the duration of 1mSec or less with no damage to the input.

### Wideband Noise:

Less than 25 mVolts RMS, referred to the input. Noise spectral density of less than 1.5nV/ $\sqrt{\text{Hz}}$  at maximum gain.

### Input Offset Voltage:

Less than  $\pm 300$  mVolts with 50 ohm source impedance.

### Overdrive Recovery Time:

Less than 25nSec for a 1 Volt input pulse.

## OUTPUT CHARACTERISTICS

### General:

Two bridged LEMO connectors per channel, Voltage source output stage, each output is capable of driving a 50 ohm load. Unused outputs do not require terminating for proper operation.

### Output Voltage Swing:

Greater than -3 Volts across 25 ohm load. Positive outputs linear to +.5 Volts across 50 ohm load or +.25 Volts across 25 ohm load.

### Output Protection:

Completely protected against overloading. Outputs can be continuously shorted to ground without suffering damage.

### Offset Voltage:

A front panel 15-turn potentiometer provides control of  $\pm 250$ mV to compensate for offsets due to ground drops or source impedances other than 50 ohms.

## GENERAL PERFORMANCE

**Gain** : Continuously variable from 2 to 50 via a front panel potentiometer; Non-Inverting.

**Stability** : Better than  $\pm 10$  mV/ $^{\circ}\text{C}$ , Referred to the input, and  $\pm 0.02\%$ / $^{\circ}\text{C}$  above 1 MHz.

**Integral Linearity** :  $\pm 0.15\%$  to -3 Volts, DC to 100 MHz into 50 ohms.

**Bandwidth** : DC to 200 MHz minimum, 3 db point; 1 Volt output excursion.

**Risetime and Faltime** : Less than 1.8nSec for a 1 Volt excursion into 50 ohms.

**Crosstalk** : Greater than 60 db isolation between channels, DC to 100MHz.

**Input to Output Delay** : Typically 4.5nSec, 5.0nSec maximum.

**Power Supply Requirements** : - 6 Volts @ 320 mA    -12 Volts @ 150 mA  
+6 Volts @ 320 mA    +12 Volts @ 150 mA

**Note:** All currents are within NIM specification limits permitting a full powered bin to be operated without overloading.

**Operating Temperature** : 0  $^{\circ}\text{C}$  to 70  $^{\circ}\text{C}$  ambient.

**Packaging** : Standard single width NIM module in accordance with TID-20893 and Section ND-524.

**Quality Control** : Standard 36-hour, cycled burn-in with switched power cycles.