



NIM Model 612AM 6-Channel Photomultiplier Amplifier

- * 6 channels/ #1 NIM module
- * Identical 50 Ohm outputs per channel
- * Gain of 2.5 to 40, direct-coupled
- * < 3 nsec risetime
- * -5 volt linear range (5000:1 usable dynamic range)
- * 0.2% integral linearity
- * Low cost

The LeCroy Model 612AM is a six-channel, wide-bandwidth amplifier with continuously adjustable gain packaged in a #1 NIM module. The unit features a bandwidth of DC to 140 MHz with a maximum gain of 40. Representing a major advance in fast amplifier stability, Dynamic Range, and general utility, the 612AM allows the experimenter for the first time to consider the use of economical lower gain photomultiplier tubes even in demanding direct-coupled ADC applications. The adjustable gain feature affords simpler high voltage distribution systems because the gains may be equalized by the 612AM. This avoids the problems of variation in photomultiplier propagation time with high voltage. The Model 612AM offers a built-in fan-out of two, simplifying simultaneous use of the same photomultiplier signal for both analog and logic purposes by eliminating the extra cable run necessary when both anode and dynode signals are used. Packaged 6 channels per module, the 612AM offers substantial savings in bin space and is directly compatible with standard LeCroy ADC's and multichannel discriminators.

A new high-speed operational amplifier circuit design makes the performance of the amplifier virtually independent of external variables such as supply voltages or temperature. Input and output DC levels remain negligibly small even when the module is moved from bin to bin, or under extremes of operating temperature. There is virtually no warmup drift on tum-on. These stability characteristics, together with the excellent linearity, speed and noise characteristics of the circuit, come very close to the ideal of a "transparent gain" element that simply magnifies the input without significant distortion or operating constraints.

The Model 612AM normally operates from +/-6, +/-12, and -24 volts. A rear-panel switch permits operation from -12 instead of -6 volts for those applications in which -6 volts is not available or where dynamic range is more important than a moderate saving in power consumption. When operated from -12 volts, maximum output amplitude is increased from -2 to -5 volts. In either case, the large output levels available reduce recovery time problems associated with overload.

SPECIFICATIONS

NIM Model 612AM 6-CHANNEL PHOTOMULTIPLIER AMPLIFIER

INPUT CHARACTERISTICS	
Impedance:	50 ohms.
Input Protection:	+/-5 A for 0.5 /usec; +/-0.5 A continuous; clamps at +/-0.6V.

Reflection Coefficient:	Less than 5% over input dynamic range.
Quiescent Voltage:	+/-0.5 mV.
OUTPUT CHARACTERISTICS (Both outputs of each used channel must be terminated for optimum wave-shape.)	
Maximum Positive Amplitude (Linear):	+200 mV.
Maximum Negative Amplitude (Linear):	-2 volts with -6 V supply; -5 volts with -12 V supply.
Overshoot:	Less than +/-10% for input risetimes >1.5 nsec and gains >4X. Slightly larger for gains <4X.
Quiescent Voltage:	0 V +/-3 mV.
Output Voltage DC Offset Temperature Coefficient:	400 uV/'C maximum.
Output Voltage Variation with Supply Voltage:	<4 mV for +/-1% variation of any supply voltage.
GENERAL	
Gain:	2.5 to 40, non-inverting. Long-term stability +/-1%.
Linearity:	0.2% integral.
Coupling:	Direct.
Risetime:	<3.0 nsec, 10% to 90%.
Delay:	Approx. 5.5 nsec.
Noise:	Less than 50 uV rms, referred to input, total.
Interchannel Crosstalk:	Output in one channel affects any other channel by no more than -40 dB.
Overload Recovery:	a) Operation with -12 volt supply: saturated for approximately 15 nsec after 10X overload. b) Operation with -6 volt supply: saturated for approximately 50 nsec after 10X overload. For wide pulses (i.e., >5 /Asec) it is recommended to use -12V supply for best overload recovery.
Packaging:	RF-shielded AEC/NIM #1 width module conforming to specifications out- lines in AEC Report TID-20893; Lemo-type connectors.
Current Requirements:	+6 V at 280 mA; -12 V or -6 V at 230 mA (selected by rear-panel switch); +12 V at 10 mA; -24 V at 80 mA.

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