

# Phillips Scientific

## Quad Two-Fold Logic Unit

## NIM MODEL 752

### FEATURES

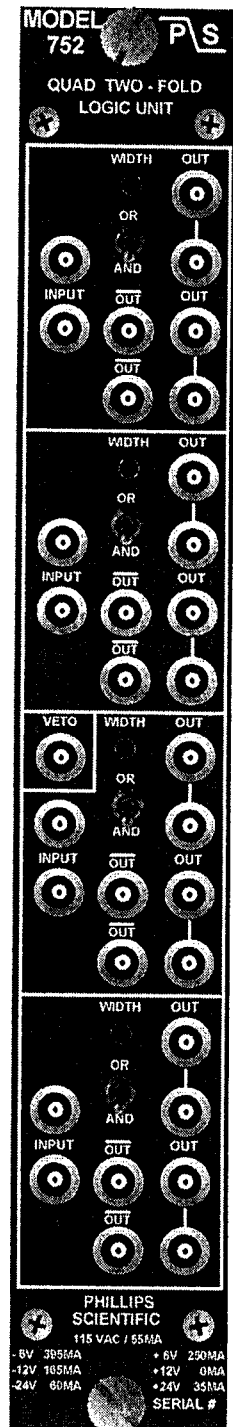
- \* 150 MHz Rate Capability
- \* Four Independent Channels
- \* High Fan-Out with Six Outputs per Channel
- \* Deadtimeless Updating Operation
- \* One NanoSecond Input Overlap Width
- \* Fast Veto and Bin Gate Inhibiting

### DESCRIPTION

The model 752 is a high-performance, four channel, two-input logic unit packaged in a single width NIM module. It performs logical AND, OR, fan-in and fan-out functions.

Each channel has two logic inputs, a two position switch for selecting the logic function desired, an output width control, and six outputs. A fast veto is common to all four channels which permits anti-coincidence decisions. In addition, a bin gate applied via the rear panel connector inhibits the entire module and is enabled or disabled from a rear panel slide switch. After the inputs have satisfied the logic function desired, triggering of an updating regenerative stage produces a standardized output pulse, independent of the input pulse shapes or overlap times. Output durations are continuously variable over the range of 4nSec to 1 $\mu$ Sec. The updating design ensures deadtimeless operation, while the double-pulse resolution is 6.5nSec for fast counting applications.

The 752 has six high-impedance current switching outputs per channel. They are configured as two pairs of double-amplitude bridged outputs and two complemented NIM levels. When only one output from the bridged pair is used, a double-amplitude NIM pulse (-32mA) is generated for driving long cables with narrow pulse widths. Two normal NIM levels are produced when both of the bridged outputs operate into 50 ohm loads. The output risetimes and falltimes are typically 1.5nSec, and their shapes are virtually unaffected by the loading conditions of the other outputs.



**Phillips Scientific**

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## INPUT CHARACTERISTICS

### Logic Inputs:

Two LEMO connector inputs per channel; 50 ohm input impedance,  $\pm 2\%$ , direct coupled; accepts NIM level logic signals (-500mV or greater). Outputs will be produced with inputs of 1nSec or greater width. Inputs are protected against damage from  $\pm 100$  Volt transients of 1 $\mu$ Sec duration.

### Fast Veto:

One LEMO connector input common to all four channels; accepts normal NIM level pulse (-500mV), 50 ohm impedance, direct coupled; The veto input must precede by 5nSec, the negative edge of input signal that would ordinarily satisfy the logic conditions; Requires a 4nSec minimum input pulse width.

### Bin Gate:

Rear panel slide switch enables or disables slow bin gate via the rear connector. Signal levels are in accordance with the TID-20893 standard. Inhibits the module within 10nSec after the bin gate signal is applied.

## GENERAL PERFORMANCE

### Logic Functions:

Logic AND, OR, Fan-In/Fan-Out. All functions have leading edge inhibit and produce standardized outputs.

### Continuous Repetition Rate:

Greater than 150 MHz minimum, input to output. Typically 160 MHz.

### Double-Pulse Resolution:

Better than 6.5nSec; typically 6.0nSec with output width set at minimum.

### Coincidence Width:

Input overlap times of 1nSec or greater will produce outputs.

### Input to Output Delay:

Less than 8.0nSec.

### Multiple Pulsing:

One and only one output pulse regardless of input pulse amplitude or duration.

### Power Supply Requirements:

- 6 Volts @ 395 mA	+6 Volts @ 250 mA
-12 Volts @ 165 mA	+12 Volts @ 0 mA
-24 Volts @ 60 mA	+24 Volts @ 35 mA
115 VAC @ 55mA	

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

### Operating Temperature:

0 °C to 70 °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.

## OUTPUT CHARACTERISTICS

### General:

Six (6) LEMO connector outputs per channel; Two pairs of negative NIM bridged outputs and two complementary outputs. The bridged pairs deliver a double amplitude pulse of -32mA (-1.6 Volts), into a single 50 ohm load and -16mA (-800mV) with both terminated. The complemented outputs are quiescently -16mA (-800mV) and go to 0mA (0Volt) into 50 ohms during output. The output rise and fall times are less than 1.5nSec from 10% to 90% levels. The output pulse shapes are optimized when the bridged outputs are 50 ohm terminated.

### Width Control:

One control per section; A front panel 15-turn screwdriver adjustment provides outputs variable from 4nSec to 1 $\mu$ Sec. Output width stability is  $\pm 0.15\%/^{\circ}\text{C}$  of setting.

### Updating Operation:

The output pulse width will be extended if a new input pulse occurs while the output is active. This provides deadtimeless operation and a 100% duty cycle can be achieved.

# MODEL 752 QUAD AND/OR LOGIC UNIT

( Front Panel Description )

Standard # 1 NIM Packaging  
in accordance with TID-20893

Two NIM Logic Inputs,  
50 ohms Direct Coupled

Two Position Toggle Switch,  
Switch Selects AND/OR Logic  
Function for each Section

Two Pairs Double-Amplitude Bridged  
NIM Outputs. Each Pair Drives  
32mA (-1.6 volts into 50 ohms, and  
+8 Volt into Two 50 ohm Loads)

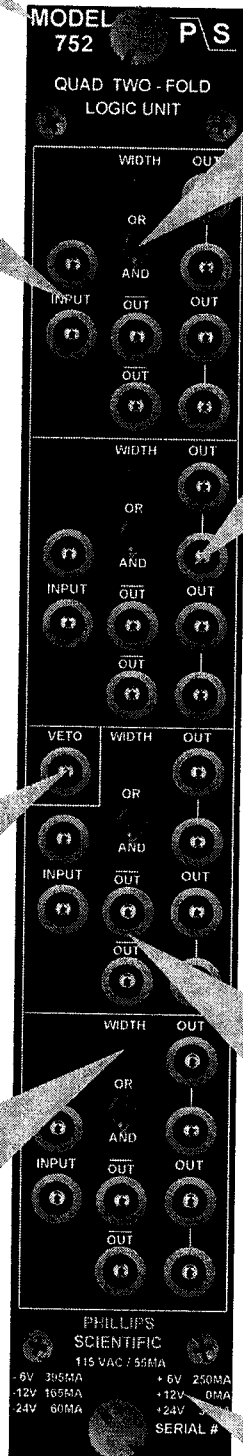
Fast Inhibit Input, 50 ohms  
Accepts Normal NIM Input Level  
to Inhibit All Four Logic Sections

Output Width Control,  
15-Turn Screwdriver Adjustment  
Variable from 4nSec to 1 $\mu$ Sec.

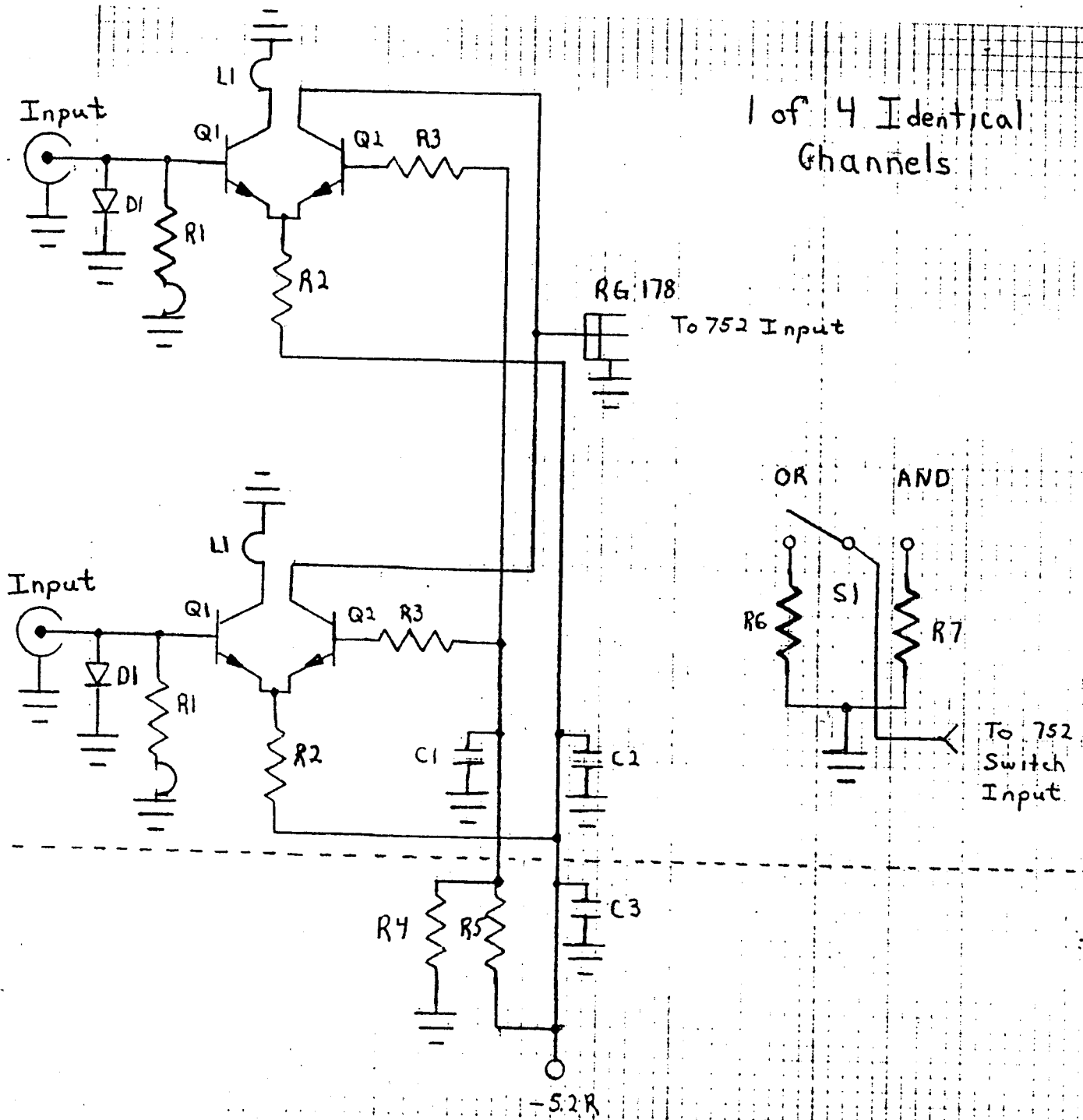
Two Complemented NIM Outputs,  
Quiescently -16mA (-800 mV) and  
0 mA (0 Volts) during Output.

NIM Voltage and Current  
Requirements

**Note:** A Bin Gate Enable/Disable Switch  
on Rear Panel, Permits Inhibiting  
via Bin Connector.



1 of 4 Identical Channels



QTY REQD	FSCM NO.	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	MATERIAL SPECIFICATION
<b>PARTS LIST</b>				
<small>UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES TOLERANCES ARE:</small> <small>POSITIONS DECIMALS ANGLES</small> <small>.XX ± ±</small> <small>.XXX ± ±</small>		CONTRACT NO. PHILLIPS SCIENTIFIC MODEL 752+1		
<small>APPROVALS</small> <small>DRAWN</small> <small>CHECKED</small> <small>ISSUED</small>		<small>DATE</small> SCHEMATIC		
<small>DO NOT SCALE DRAWING</small>		<small>SIZE</small> SCALE	<small>FSCM NO.</small> 1001	<small>DWG. NO.</small> 1094 <small>REV.</small> 1002 SHEET 1 OF 1