

NSCL-ELECTRONIC

MODEL 688AL

Counting Area

WARRANTY

LeCROY RESEARCH SYSTEMS CORP. warrants each instrument it manufactures to be free from defects in material and workmanship under normal use and service for the period of 1-year from date of purchase. Custom monolithics and hybrids sold separately and all spare or replacement parts are warranted for 90-days. This warranty extends only to the original purchaser. This warranty shall not apply to fuses, disposable batteries or any product or parts which have been subject to misuse, neglect, accident or abnormal conditions of operations.

In the event of failure of a product covered by this warranty, LeCroy will repair and calibrate an instrument returned to the factory or an authorized service facility within 1 year of the original purchase; provided the warrantor's examination discloses to its satisfaction that the product was defective. The warrantor may, at its option, replace the product in lieu of repair. With regard to any instrument returned within one year of the original purchase, said repairs or replacement will be made without charge. If the failure has been caused by misuse, neglect, accident or abnormal conditions or operations, repairs will be billed at a nominal cost. In such case, an estimate will be submitted before work is started, if requested.

The foregoing warranty is in lieu of all other warranties, express or implied, including but not limited to any implied warranty of merchantability, fitness or adequacy for any particular purpose or use. LeCroy Research Systems Corp., shall not be liable for any special, incidental or consequential damages, whether in contract, tort or otherwise.

IF ANY FAILURE OCCURS, notify LeCroy Research Systems Corp., or the nearest service facility, giving full details of the difficulty, and include the Model number, serial number, and FAN (Final Assembly Number) or ECO (Engineering Change Order) number. On receipt of this information, service data or shipping instructions will be forwarded to you. On receipt of the shipping instructions, forward the instrument, transportation prepaid. A Return Authorization number will be given as part of shipping instructions. Marking this RA number on the outside of the package will insure that it goes directly to the proper department within LeCroy. Repairs will be made at the service facility and the instrument returned, transportation prepaid.

ALL SHIPMENTS OF LECROY INSTRUMENTS FOR REPAIR OR ADJUSTMENT should be made via Air Freight or "Best Way" prepaid. The instrument should be shipped in the original packing carton; or if it is not available, use any suitable container that is rigid and of adequate size. If a substitute container is used, the instrument should be wrapped in paper and surrounded with at least four inches of excelsior or similar shock-absorbing material.

IN EVENT OF DAMAGE IN SHIPMENT to original purchaser the instrument should be thoroughly inspected immediately upon original delivery to purchaser. All material in the container should be checked against the enclosed packing list. The manufacturer will not be responsible for shortages against the packing sheet unless notified immediately. If the instrument is damaged in any way, a claim should be filed with the carrier immediately. (To obtain a quotation to repair shipment damage, contact the LeCroy factory or the nearest service facility).

DOCUMENTATION DISCREPANCIES OR OMISSIONS. LeCroy Research Systems is committed to providing unique, reliable, state-of-the-art instrumentation in the field of high-speed data acquisition and processing. Because of this commitment, the Engineering Department at LeCroy is continually refining and improving the performance of products. While the actual physical modifications or changes necessary to improve a model's operation can be implemented quite rapidly, the corrected documentation associated with the unit usually requires more time to produce. Consequently, this manual may not agree in every detail with the accompanying unit. There may be small discrepancies that were brought about by customer-prompted engineering changes or by changes determined during calibration in our Test Department. These differences usually are changes in the values of components for the purposes of pulse shape, timing, offset, etc., and only rarely include minor logic changes. Where any such inconsistencies exist, please be assured that the unit is correct and incorporates the most up-to-date circuitry. Whenever original discrepancies exist, fully updated documentation should be available upon your request within a month after your receipt of the unit.

ANY APPLICATION OR USE QUESTIONS, which will enhance your use of this instrument will be happily answered by a member of our Engineering Services Department, telephone 914-425-2000 or your local distributor. You may address any correspondence to:

LeCroy Research Systems Corp., 700 S. Main Street,
Spring Valley, New York 10977, ATTN: Engineering Services Dept.

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A T T E N T I O N

SEE POCKET IN BACK OF MANUAL FOR SCHEMATICS, PARTS LISTS, AND ADDITIONAL ADDENDA WITH ANY CHANGES TO MANUAL.

BECAUSE OF THE SIMPLICITY OF THE CIRCUIT AND FUNCTIONS OF THIS LeCROY MODEL, THE INCLUDED SCHEMATIC AND SPEC SHEET SHOULD BE ALL THAT IS REQUIRED FOR OPERATION.

IF YOU NEED ANY ADDITIONAL INFORMATION, PLEASE CONTACT LeCROY ENGINEERING DEPARTMENT.

A T T E N T I O N

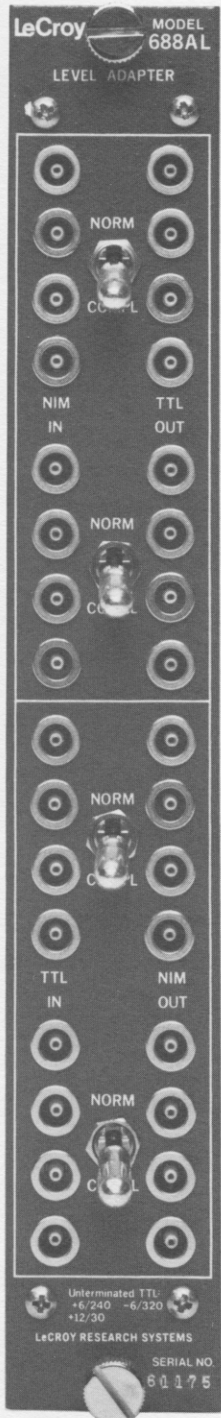
NIM Model 688AL Level Adapter

- 8 NIM to TTL and 8 TTL to NIM converters
- Direct - coupled
- Full input protection
- TTL outputs compatible with terminated 50 Ω cable
- Switchable normal or complementary operation in groups of four
- No duty cycle limitations
- Single-width module

The LRS Model 688AL Level Adapter provides 8 channels of direct-coupled NIM-to-TTL and 8 channels of TTL-to-NIM conversion in a single-width NIM module. Standard negative TTL notation is used to be compatible with unterminated CAMAC and slow NIM logic levels.

The NIM-to-TTL section accepts either normal or complementary NIM logic levels (logical "0" = 0 to -2 mA; logical "1" = -12 to -32 mA) at each of its eight 50 Ω inputs. The 8 outputs switch between zero volts and +2.5 volts for a time equal to the input signal duration. The polarity of the outputs is controlled by two front-panel switches common to two groups of four channels and provides either normal or complementary operation. Up to 50 mA at +2.5 volts is delivered from each output, making the TTL drive capability compatible with terminated, direct-coupled 50 Ω cable. The low level clamp capability is 100 mA, or approximately 60 standard TTL loads. Direct-coupled, the 688AL is free from any rate effects and has no limitations on duty cycle.

The TTL-to-NIM section accepts standard negative TTL logic levels (logical "1" = 0 to +.8V; logical "0" = > 2 volts) at each of its eight inputs. The minimum input duration for a full output is 10 ns. The output from each channel is a standard NIM logic level which switches between 0 volts and -16 mA (-800 mV into 50 Ω) during an output. Risetimes and falltimes are < 3 ns and the output width is approximately equal to the duration of the input signal. Two front-panel switches common to two groups of four channels provides either normal operation (TTL logical "1" IN gives NIM logical "1" OUT) or complementary operation.



May 1982

Innovators in Instrumentation

SPECIFICATIONS

NIM Model 688AL

LEVEL ADAPTER

NIM TO TTL SECTION

NUMBER OF CHANNELS	Eight.
INPUT CHARACTERISTICS	
Impedance:	$50\ \Omega \pm 5\%$; reflections $< 10\%$ for risetime > 2 ns.
Quiescent DC Level:	0 volts.
Input Signal:	Normal (logical "0" = 0 to -2 mA; logical "1" = -12 to -32 mA) or complementary fast NIM logic levels.
Input Protection:	± 5 volts.
Minimum Input Width:	Less than 10 ns.
OUTPUT CHARACTERISTICS	
Signal Levels:	Standard negative TTL logic levels; logical "1" ≤ 0.4 volts; logical "0" $> +2.5$ volts.
High Level Drive Capability:	50 mA at +2.5 volts (compatible with terminated, direct-coupled $50\ \Omega$ cable.)
Low Level Clamp Capability:	100 mA at 0 ± 500 mV (60 standard TTL loads, or $50\ \Omega$ to +5 volts).
Risetime and Faltime:	Less than 10 ns.
Output Duration:	Approximately equal to input duration.
Output Impedance:	Less than $5\ \Omega$.
Duty Cycle Limitations:	None.
GENERAL	
Delay:	Approximately 12 ns.
Logic Polarity:	Two front-panel switches, each common to four channels, provides normal operation (logical "1" IN gives logical "1" OUT) or complementary operation.

TTL TO NIM SECTION

NUMBER OF CHANNELS	Eight.
INPUT CHARACTERISTICS	
Input Signal:	Standard negative TTL logic levels (logical "1" = 0 to +0.8 volts, requires -1.6 mA max.; logical "0" = > 2 volts, requires +100 μ A max.)
Minimum Input Duration:	Less than 10 ns.
Input Protection:	± 5 A for 0.5 μ s, clamping at +7 and -1 volts.
OUTPUT CHARACTERISTICS	
Signal Levels:	Logical "0", open circuit; logical "1", -16 mA.
Output Duration:	Approximately equal to input duration.
Risetime and Faltime:	Less than 3 ns.
Duty Cycle Limitations:	None.
GENERAL	
Delay:	Approximately 6 ns.
Logic Polarity:	Two front-panel switches, each common to four channels, provide normal operation (logical "1" IN gives logical "1" OUT) or complementary operation.
MODULE CHARACTERISTICS	
Packaging:	NIM single-width module; Lemo-type connectors.
Current Requirements:	+6 volts at 280 mA; +12 volts at 30 mA; -6 volts at 300 mA.

SPECIFICATIONS SUBJECT TO CHANGE

MODEL 688AL
OPERATING NOTES

The LeCroy Model 688AL performs a routine and otherwise somewhat cumbersome interfacing function in a simple and straightforward way. The front panel is self-explanatory and there are few precautions or potential problems.

Note that the TTL components of the Model 688AL are intended for driving terminated 50 Ω lines. Because this drive capability is built into the unit, these lines should be routinely terminated at the TTL load, even when the cable runs involved are short.

The terminating resistors may be connected either to ground or to V_{CC} (+5 V). The connection is normally made to ground, especially for outputs that are quiescently low, to minimize power dissipation. Lines that are quiescently high will dissipate quiescent power in either connection.

August, 1977

DESCRIPTION

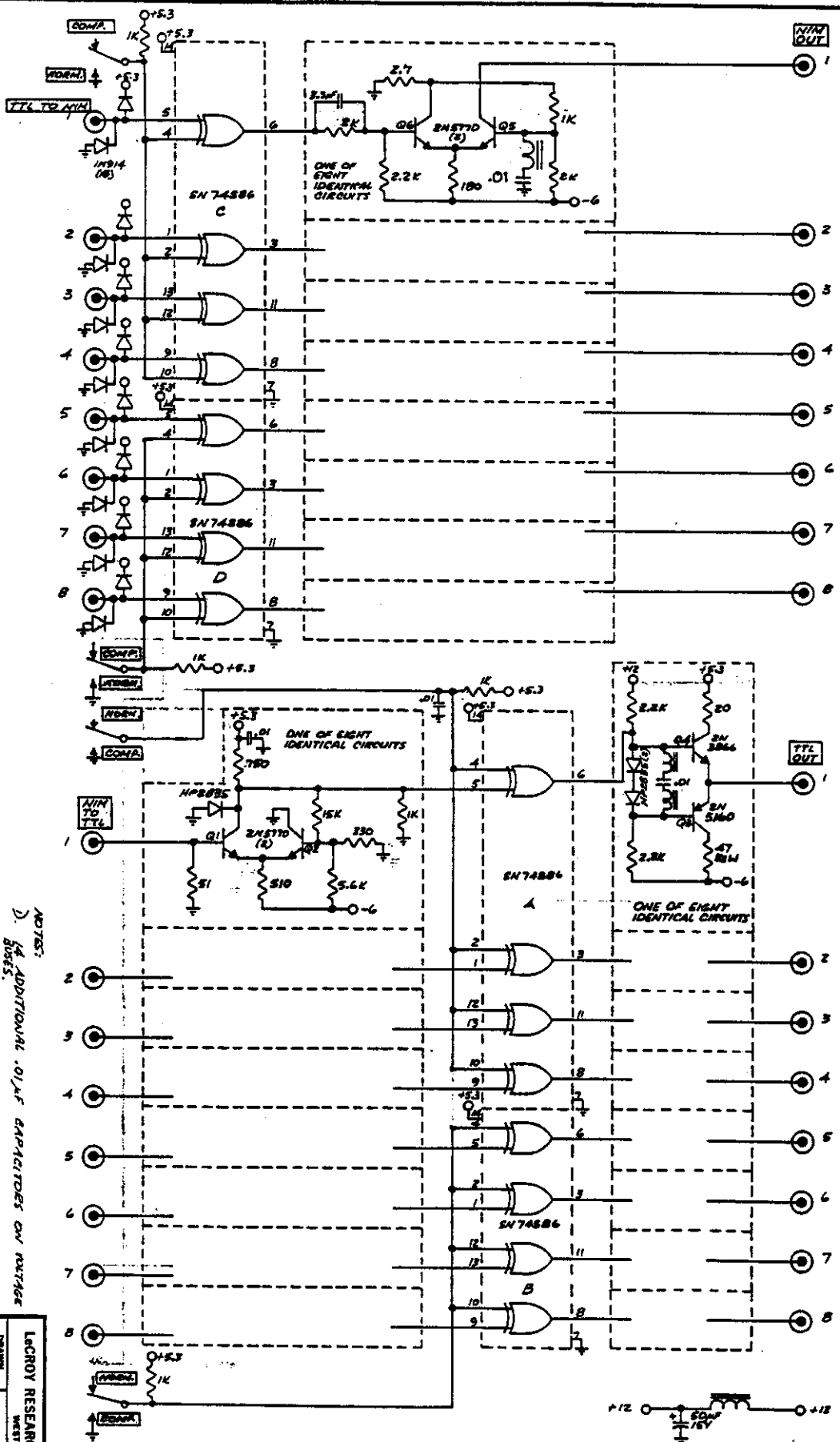
DATE

ECO NO.

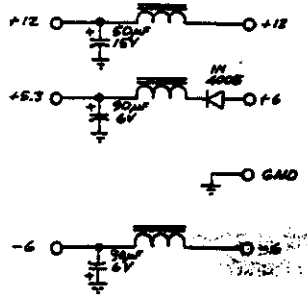
874	6-17-75	Q5 BASE RES. CHANGED FROM 620 OHMS TO 1K/ Q5 - Q6 EMITTER RESISTOR CHANGED FROM 220 TO 180 OHMS.
938	10-13-75	PARTS LIST ONLY: NEW WRAPAROUND TO BE USED. TAPING CHANGES FROM /B TO /C.
055	2-27-76	PARTS LIST CHANGE ONLY.
097	3-19-76	ALL MBD 101 DIODES CHANGED TO HP 2835.
123	4-21-76	OUTPUT DIODES CORRECTED TO HP 2835 - PARTS LIST & ASSEMBLY DRAWING ONLY.
1001	2-2-78	CHANGED 1N4001 DIODE TO 1N4005.
1002	7-27-78	PARTS LIST UPDATED ONLY.
1003	8-28-78	PARTS LIST UPDATED ONLY.
1004	5-11-79	PARTS LIST CORRECTION ONLY. (PRIORITY 4)
1005	6-1-79	ASSEMBLY DRAWING CORRECTION ONLY. (PRIORITY 4)
1006	7-25-79	PARTS LIST CHANGE ONLY (PRIORITY 4).

Remarks: On Priorities
 1-Recall, field retrofit
 2-Rework shippable units
 3-Rework units in fabrication, assembly or test
 4-Improvements for future MO's

LeCROY RESEARCH SYSTEMS CORPORATION WEST NYACK, NEW YORK		
DRAWN	ENGINEERING CHANGE ORDERS	
CHECKED	MODEL 688A	
DATE	DRAWING No.	



NOTES:
 1. ADDITIONAL .01UF CAPACITORS ON RUTAGE
 2. SEE ADDITIONAL .01UF CAPACITORS ON RUTAGE



LECROY RESEARCH SYSTEMS CORPORATION
 WEST YONK, NEW YORK
 DRAWING NO. C88A-S1
 DATE 2/25/79
 CHECKED [Signature]
 DATE [Signature]
 LEVEL ADAPTER
 MODEL C88A-S1
 PCB NO. 10005
 MFR 2-25-79