

CUSTOM CIRCUIT MODULE

Catalog No. NL-370

DESCRIPTION

Module for special circuit designs.

PICTORIAL LENS: Blank lens for custom marking by user.

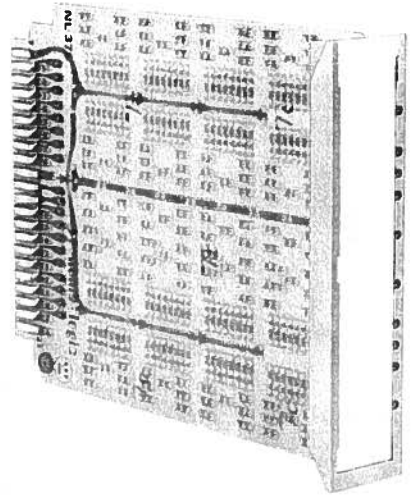
TEST POINTS: Test points accessible at front face to facilitate signal tracing.

TERMINATION: Nickel gold-plated edge pins are used for all input-output connections (22 pins per side).

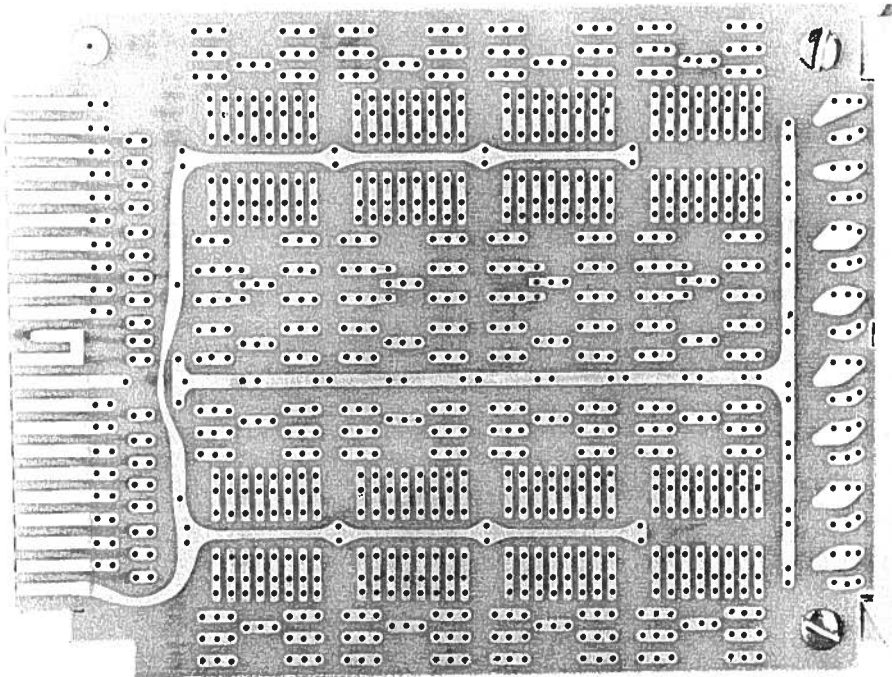
SPECIFICATIONS

The standard module for custom circuit designs. Consists of a G-10 printed circuitboard with faceplate and blank lens. The printed circuit has standard holes, conductors, and termination points to accommodate IC and discrete components. One hundred (100) loose pins are provided for point-to-point wire wrapping on the module.

Electrical interlock: pin 21 to pin 23.

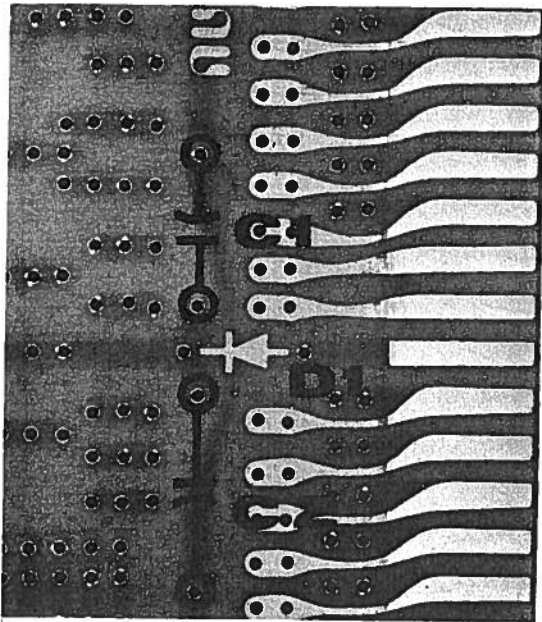


A. Copper Side



CUSTOM CIRCUIT MODULE

B. Component Side



D1 — IN4004 or equivalent diode necessary for reduction of 5.7 VDC to 5.0 VDC when using TTL.

C1 — 47 MFD — Recommended filter when using triggered circuits (such as flip-flops, counters, etc.).

C2 — 0.1 MFD — Recommended filter when using triggered circuits (such as flip-flops, counters, etc.).

COPPER-CLAD CUSTOM CIRCUIT MODULE

Catalog No. NL-371

DESCRIPTION

Module for special circuit designs.

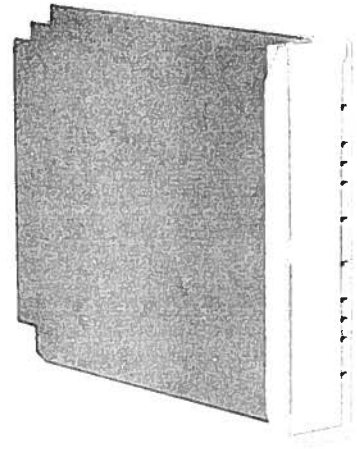
PICTORIAL LENS: Blank lens for custom marking by user.

TEST POINTS: Test points accessible at front face to facilitate signal tracing.

SPECIFICATIONS

Unetched, double-sided, copper-clad circuit board for designing custom circuits. Consists of a G-10 printed circuit board with faceplate, blank lens, and six test points.

NOTE: If this module is used to fill empty module slots in a rack, disconnect all power connections on the module connector before applying power.



LOGIC TRAINER/TESTER

Catalog No. NLT-303

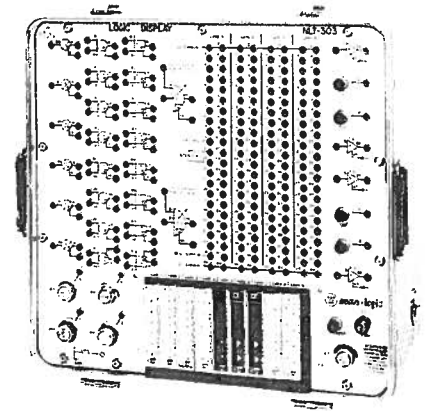
DESCRIPTION

Nine-module rack with five modules (NL-302L, NL-341L, NL-342L, NL-344L and NL-320L) and an assortment of plug-in jumpers for programming. Each module has inputs and outputs wired to test-jacks on the front of the tester. Pins for blank slots are wired to the plate, allowing any module to be inserted in those positions. Programming is accomplished by inserting plug-in jumpers between jacks. Unit can be used for training, demonstrations, circuit prototyping and testing modules.

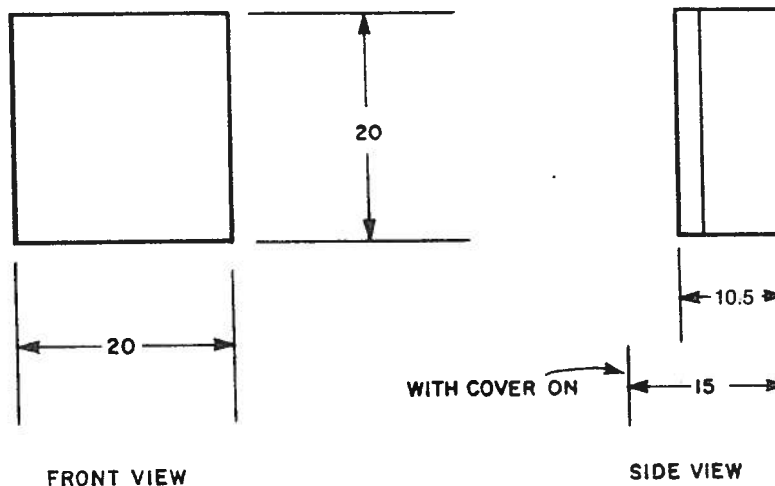
APPLICATION NOTES

CAUTION: Do not remove or install any modules or jumper wires while the NLT-303 is turned on. Be sure that the switch on the bottom right of the front of the tester (the on/off switch) is in the off position before removing any wires or modules.

1. Rack positions 1, 2, 3, 4 and 9 contain, respectively: NL-302L, NL-341L, NL-342L, NL-344L and NL-320L. An NLPS-315 power supply is built-in to provide DC power.
2. Rack positions 5 through 8 will accommodate any module in the Numa-Logic 300 Series.
3. 110 VAC power can be supplied by either a powered wall socket or by taking 110 VAC off an existing control panel and wiring directly into the L1 (HOT) and L2 (NEUTRAL) test jacks located on the faceplate of the Logic Trainer/Tester
4. The Logic Trainer/Tester is protected against AC overcurrents by a plug-in fuse.
5. AC inputs into the Logic Trainer/Tester can be simulated either through OFF-ON selector switches, or from pilot devices located on an existing machine.
6. AC output loads on the Logic Trainer/Tester are 110 VAC pilot lights, or the AC outputs can be wired to external loads.



DIMENSIONS IN INCHES
WEIGHT 48 LBS.



LOGIC TEST PROBE

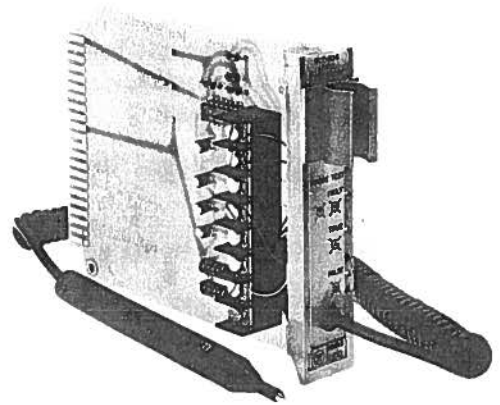
Catalog No. NLT-304

DESCRIPTION

Used to check logic test points on module faceplate and to verify changes to back plane wiring. Red and white LED's on probe indicate presence of logic 1 and logic 0. Designed for panel or rack mounting.

TERMINATION. Nickel gold-plated edge pins are used for all input-output connections.

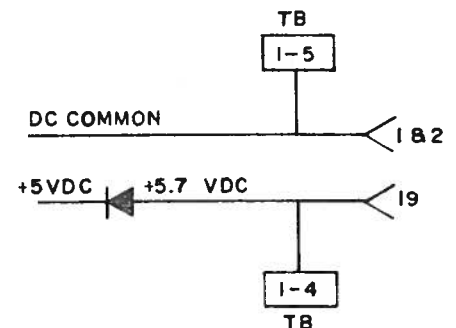
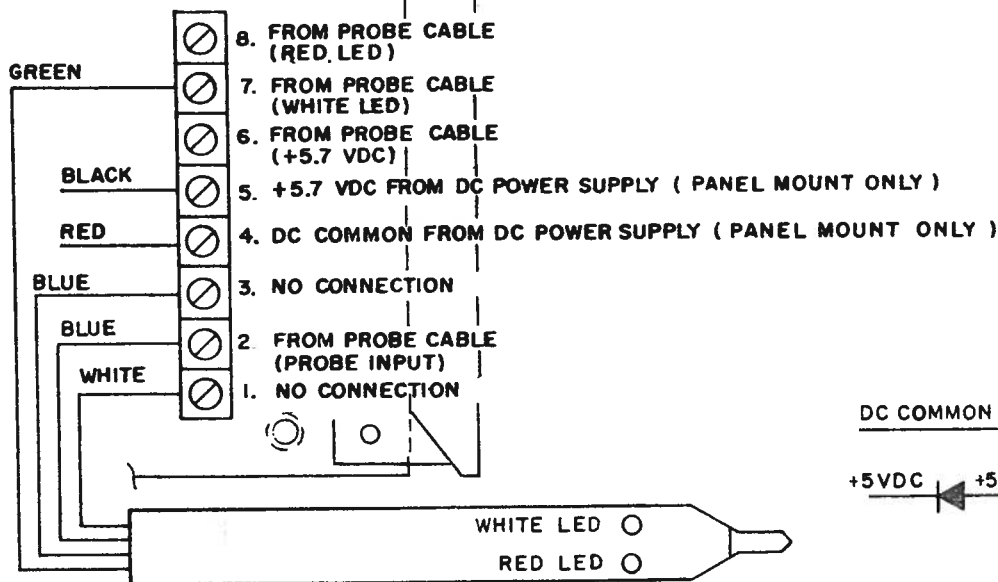
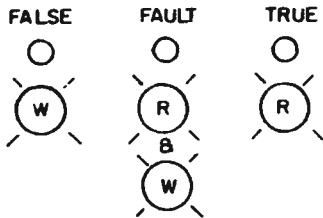
PICTORIAL LENS. Standard lens shown.



SPECIFICATIONS

Power requirement	+5.7 VDC, 50 mA
Input impedance	10K ohms
Voltage response	0.0—0.8 VDC: red LED illuminated
TRUE (logic 1)	0.8-2.4 VDC: red and white LEDs illuminated
FAULT	2.4-5.7 VDC or open circuit: white LED illuminated
FALSE (logic 0)	To 120 VAC
Overvoltage protection	Test pins to check operation of probe in TRUE, FAULT and FALSE region

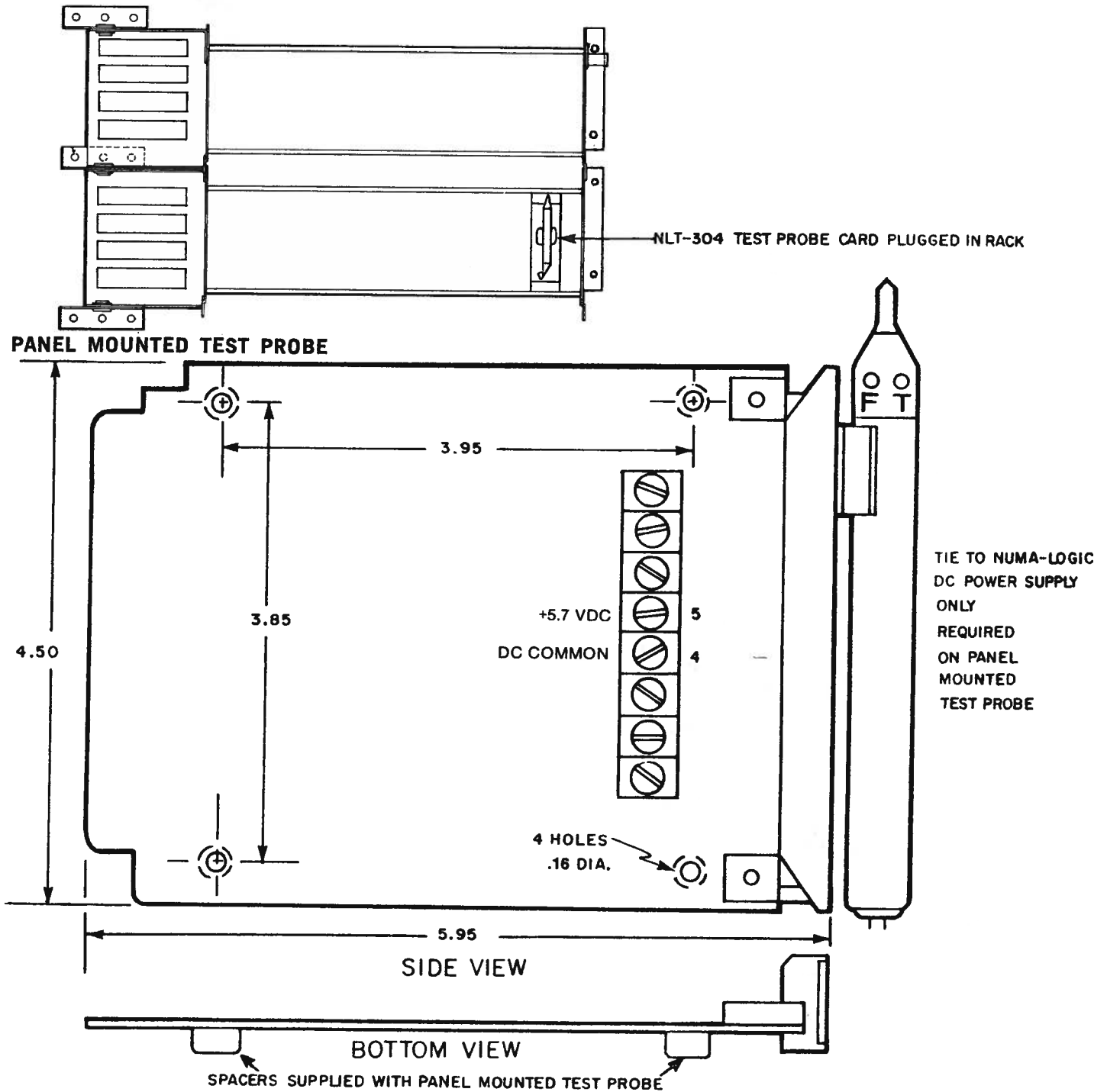
PROBE TEST



LOGIC TEST PROBE

APPLICATION NOTES

1. The Logic Test Probe module can be plugged directly into the rack providing the connector has +5.7 VDC on pin 19 and DC common on pins 1 and 2.
2. The probe tip is isolated from AC and also has oven voltage protection.
3. Probe cable length extends to 6 feet.



EXTENDER BOARD

Catalog No. NLT-302

DESCRIPTION

Extends module out of rack for access to module components while energized.

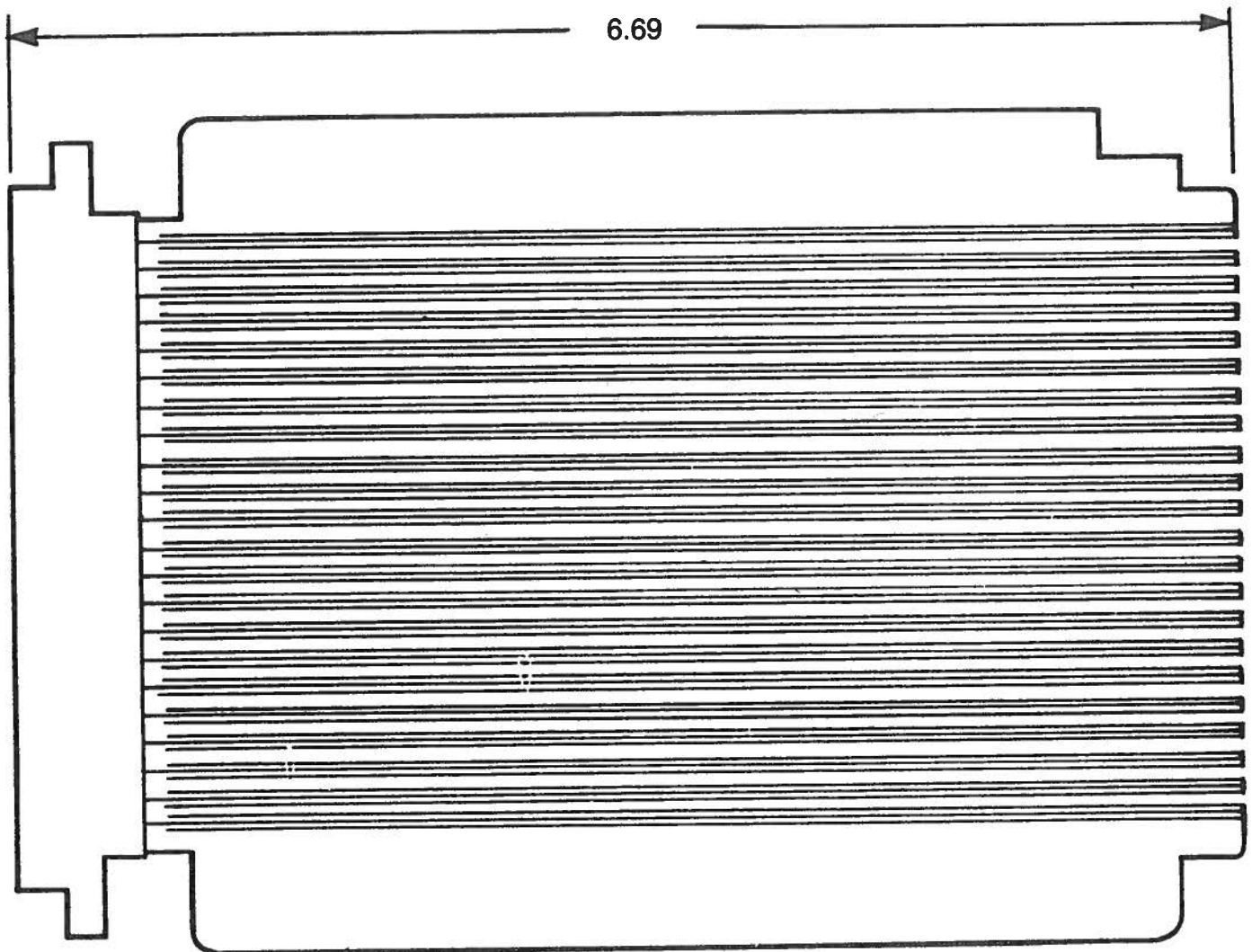
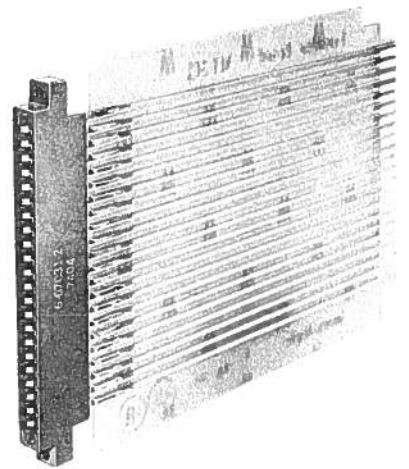
TERMINATION

Nickel-gold plated edge pins are used for all input-output connections (22 pins per side).

SPECIFICATIONS

This module consists of a G-10 printed circuit board with 22 lines per side running to a standard connector for module insertion.

Mechanical keying: Overrides mechanical keying, plugs into every slot.

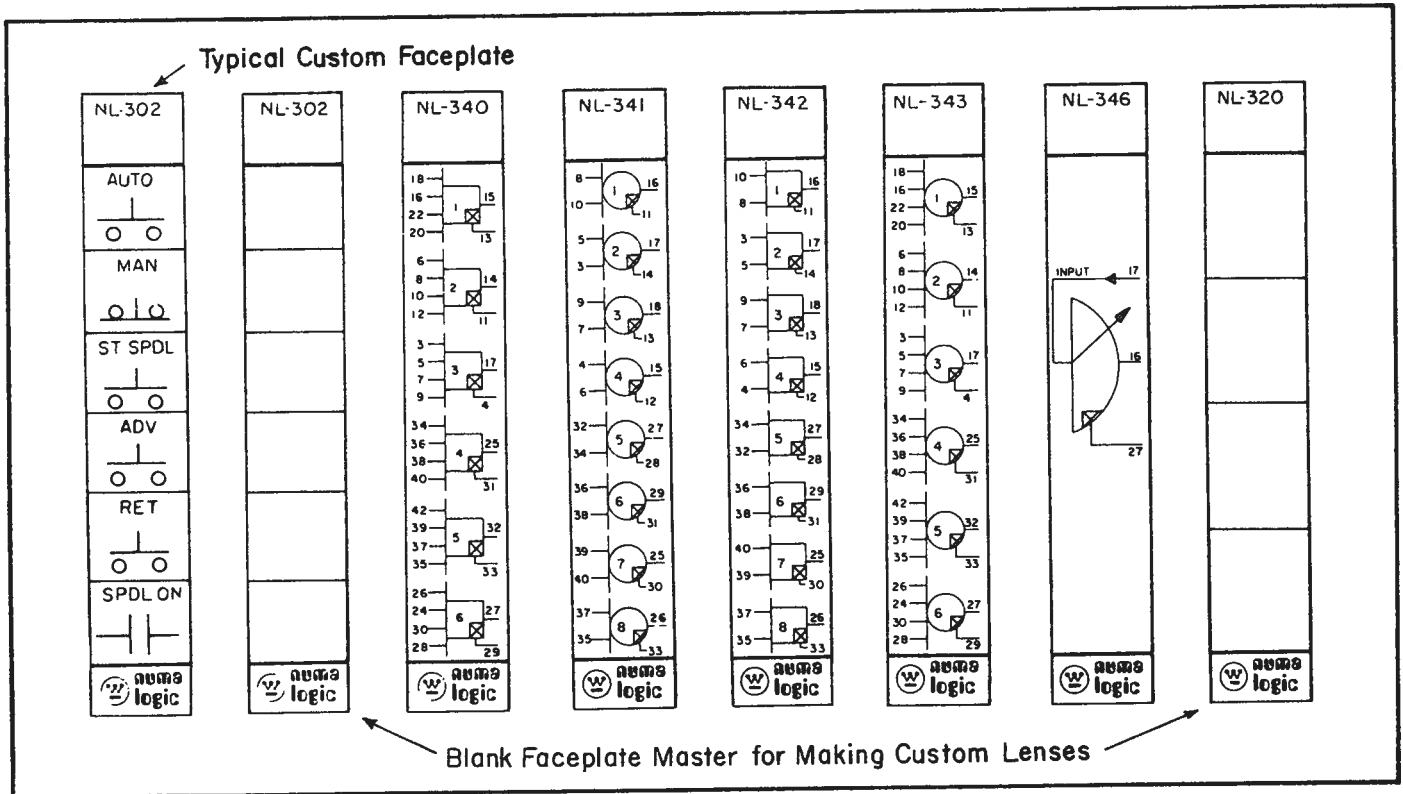


FACEPLATE

Catalog Nos. NLDA-301 (English), 302 (ANSI)

DESCRIPTION

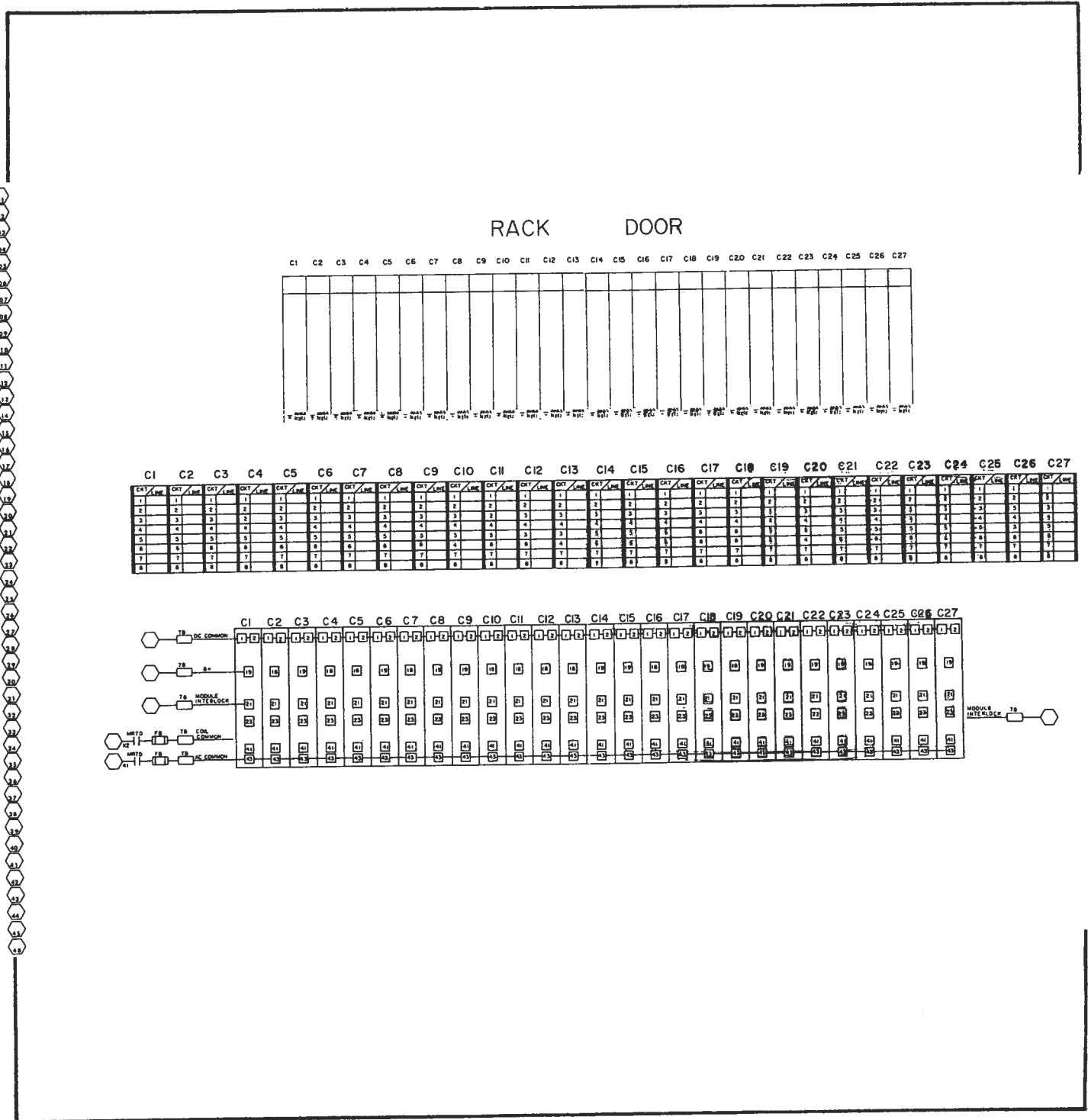
Full size photo positives for standard faceplates on all 300 Series cards that can be used to detail the rack layout sheet. Specify English logic or ANSI Y32.14. This includes one faceplate for each 300 Series card. Refer to Section 3 of this manual for application.



Typical faceplate Mylar masters.

DESCRIPTION

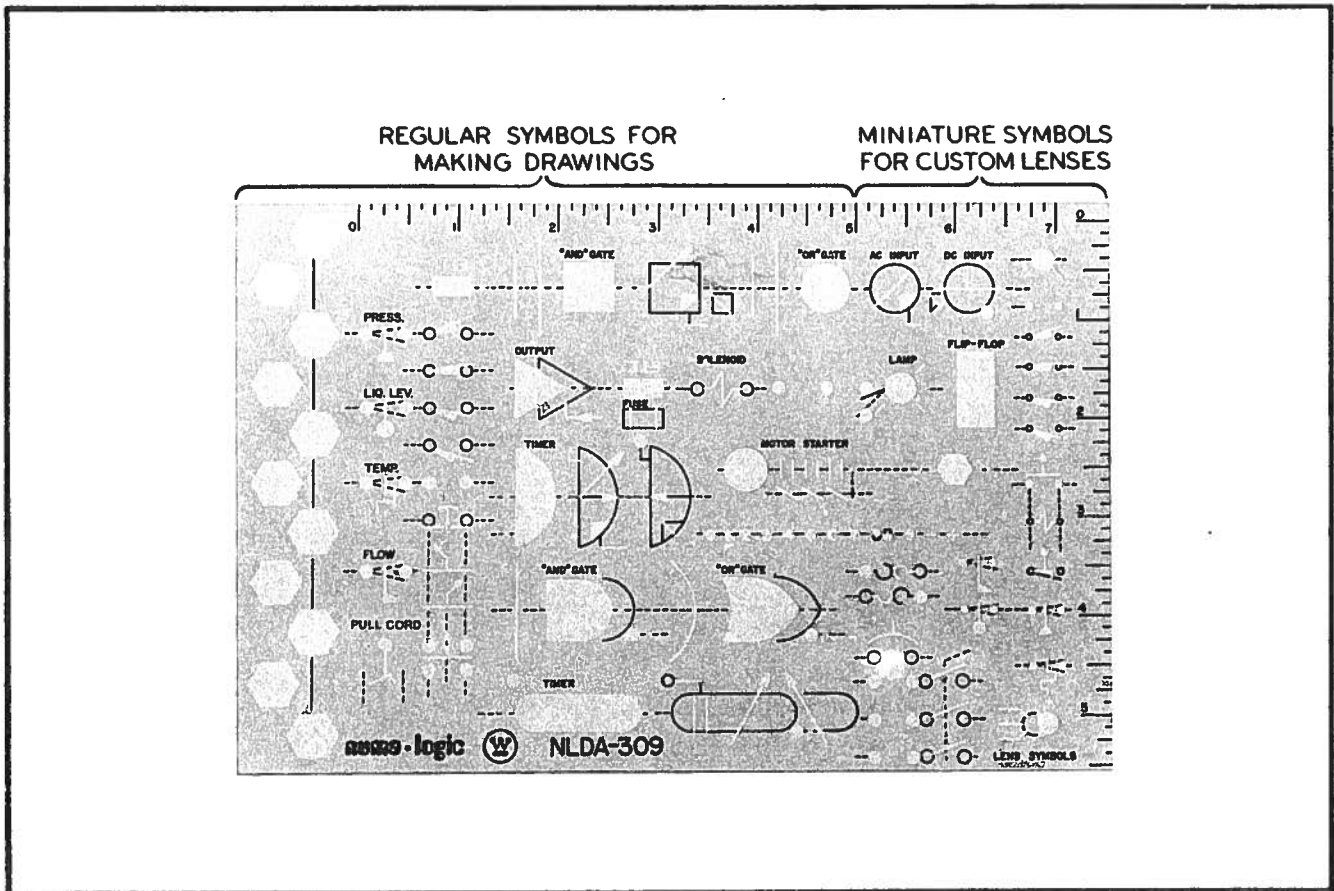
Photo positive (24" x 36") of rack layout and bussing. Specify rack size: 9, 18, 27 modules. Also include bus connections on rear of rack such as the +5.7, AC, etc., connections and complete truth tables for all 300 Series cards. See Section 3 for application.



Example - 18 Module Rack

DESCRIPTION

The drawing template includes standard symbols of pushbuttons, limit switches, motors, solenoids, etc. It also includes logic symbols in standard English and ANSI representation and miniature symbols for making custom lenses.



Control symbol drawing template.

COMPONENT DATA GLOSSARY

CONTINUOUS CURRENT	The amount of current flowing through the output driver at steady state. The resistive loading maintains the steady state.
ELECTRICAL INTERLOCK	A safety feature through which the system's power is wired so that when any module is removed from the rack, power to the entire system is disengaged. To implement the electrical interlock, the field voltages must be wired through pins 21 and 23.
FAN-IN	The logic input loading. Each logic input circuit has a 1.6 mA loading.
FAN-OUT	The number of logic circuits that a logic circuit output can support. The output of each logic circuit can support 10 unit loads or 16 mA.
INPUT IMPEDANCE	The amount of resistance to the AC and DC current flow caused by the input device. This resistance rating also determines the minimum amount of current that is required to turn on the module (input loading).
INRUSH CURRENT	The amount of current flowing through the output driver at the moment the output circuit changes to the ON state.
LEAKAGE CURRENT	The amount of current flowing through an output circuit when the circuit is in the OFF state.
LOGIC LEVEL	The voltage level of the logic signals. "Logic 1" is defined as 0.0 - 0.8 VDC and "Logic 0" is defined as 2.4 - 5.0 VDC for 300 Series modules.
MECHANICAL KEYING	The method of assigning a particular slot in a rack to a particular style logic module and preventing the insertion of a different style module.
NOISE ENERGY REJECTION	The technique of rejecting noise transients by the amount of energy contained within that transient rather than by its voltage alone.
OPTICAL ISOLATION	The technique of isolating all signals and grounds using a semiconductor light emitting diode (LED) directed at a photosensitive transistor.
OUTPUT DRIVER	The device in the output module that performs the switching of the field voltages.
POWER-ON RESET DELAY	The technique of resetting all nonretentive memories and outputs for a predetermined period when DC power is applied to the system.
PROPAGATION DELAY	The reaction time of a 300 Series module to a signal. Once the module receives the signal, there is a delay before the circuit changes state. This delay affects the maximum frequency to which the module can react. The formula for the maximum pulses per second to which the module will react is $P \times 2$, where P equals propagation delay.

TTL

An abbreviation for Transistor-Transistor Logic. A family of low voltage, low power integrated circuits used in 300 Series components.

TEMPERATURE RATING

The extreme temperatures at which the system can operate.

VOLTAGE DROP

The difference in voltage between the voltage input (L1) and the output of the module.

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