DATA LOGGING AMPLIFIER

TYPE DLA52E

GENERAL ELECTRIC

AI33 CARD LOC.	INPUT	OUTPUT	I	CARD POSITIONS ON DLA52D FORM #
A	—	—	—	
A	412	452,453	X	
B	413	454,455	X	
C	414	456,457	X	
D	415	458,459	X	
E	416	462,463	X	
F	417	464,465	X	
G	418	466,467	X	
H	419	468,469	X	
J	422	472,473		
K	423	474,475		
L	424	476,477		
M	426	478,479		

DLA ISOLATOR AI33

+15V

RR

RR

NOT

AND

OTJ GTJ

3 4 2

(NOT USED)

TO PIN4 ALL CARDS

INPUT SEE TABLE

412

CARD LOC.

7 8

OUTPUT SEE TABLE

10 Ω, 5W

RR

TO PIN 10 ALL CARDS

(+15V)

(−15V)

TO PIN 1 ALL CARDS C411, C421

C451, C461, C471

DL

TO SURGE GRD

4 3 2 1

LEGEND —
RR = ELEC-TROL R11861

CONTACT RATINGS —
10VA MAX
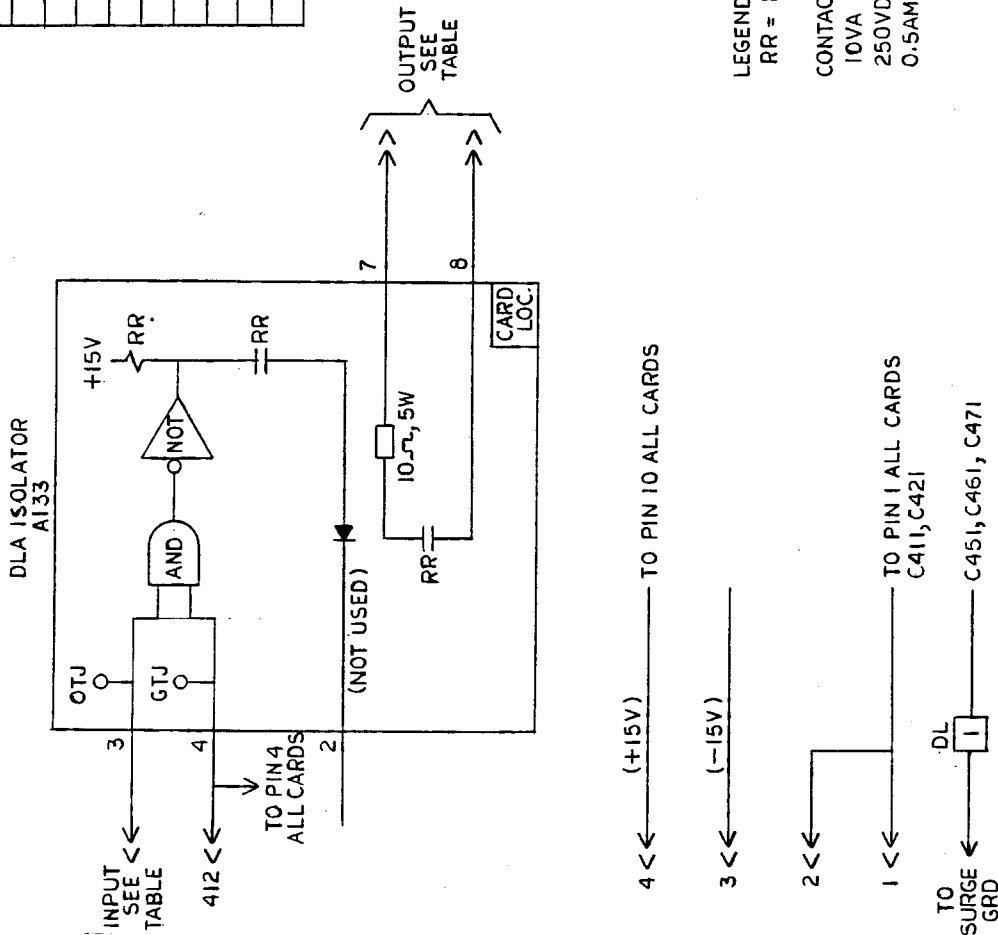250VDL MAX
0.5AMP RESISTIVE MAX

Fig. 1 (0138B7338-0) Internal Connections Diagram for the DLA52E Relay

DATA LOGGING AMPLIFIER

TYPE DLA52E

DESCRIPTION

The Type DLA52E is a data logging amplifier used to provide isolation and amplification of static relay logic signals for external monitoring. It is designed for use with General Electric MOD III static transmission line relay equipment, and is powered from the output of a Type SSA50 or SSA51 isolated plus or minus 15 volt logic DC supply. One high speed contact output is provided per each logic point monitored, and the DLA can be ordered for any number of monitor points from one to eight. The DLA output contacts have a 2.0 millisecond operating time and are available as normally open or normally closed contacts. Two output contacts are available for monitored point.

This relay is packaged in a two rack high unit case suitable for mounting on a standard 19-inch electronic rack. The outline and mounting dimensions are shown in Fig. 2, and the internal connections for the DLA52E are shown in Fig. 1.

APPLICATION

The DLA52E is designed for use with MOD III static relays for transmission line protection. All MOD III SLA units (model numbers higher than SLA50) include facility for direct interconnection between the SLA and DLA units by a ten-conductor plug-in shielded signal cable on a socket designated C411. The logic points selected for monitoring inside the SLA are shown on the overall logic diagram and SLA option chart for the specific equipment. Different or additional logic points can be selected in the SLA by changing the option jumpers on the matrix connection blocks inside the SLA. Refer to the SLA internal connection diagram and option chart to determine the availability of various logic points for monitoring.

The DLA52E should be mounted at the static relay equipment and connected to the SLA unit and the SSA power supply by plug-in shielded cable provided by the factory, to avoid introduction of noise into static relay signal circuits. It will be necessary to determine whether there is sufficient reserve output capacity in the SSA power supply for the particular equipment design to accomodate the DC burden of the DLA52E with the desired number of monitoring points.

The DLA52E dry contact outputs are brought out of the back of the DLA unit case on ten-point plugs (C451 through C481). These outputs can be connected to a remote oscillograph or other monitoring device by direct connection via shielded cables, or by interfacing shielded cables from the DLA to terminal blocks at the static relay equipment, and connecting external cables from the equipment entrance terminal blocks

to the remote oscillograph. The shields on the DLA output cables should be connected to the surge ground at the static relay equipment. It is recommended that the cables to the remote oscillograph be routed away from other power cables, and that the interconnecting cable lengths be restricted to 100 feet or less.

RATINGS

The DLA52E presents a maximum burden of 28 milliamperes to the positive DC power supply and 170 milliamperes to the negative DC power supply, when all circuits are ON (LOGIC ONE). It presents a burden of 45 milliamperes to the positive DC power supply and 28 milliamperes to the negative DC power supply, when all circuits are OFF (LOGIC ZERO).

CIRCUIT DESCRIPTION

The DLA52E is used when monitoring relay circuitry functions involving current-sinking type logic, where the presence or absence of signals, rather than their magnitude, controls the operation. Therefore, with respect to the reference bus, signals below one volt represent an OFF condition (LOGIC ZERO), while signals resulting in an ON condition (LOGIC ONE) are generally in the range of plus 12 to plus 15 volts. Current-sinking type logic is a logic system where the output stage that is OFF actually draws current from the stage that it is driving to prevent it from turning ON.

The circuit for a single DLA point is shown in Fig. 4. The circuitry is basically that of a transistor switch. Its operation is as indicated below.

For a LOGIC ZERO input signal at pin 3, transistor Q1 will be turned off. No base current will flow to transistor Q2 keeping it off. With transistor Q2 turned off, no current will flow through the relay coil.

For a LOGIC ONE input signal at pin 3, transistor Q1 will be turned on. This will provide base current for transistor Q2, turning it on. This will sink current through the relay coil, picking it up.

CONSTRUCTION

The DLA52E is packaged in a metal enclosed case which is suitable for mounting on one standard 19-inch rack. The outline and mounting dimensions of this case and the physical location of the components are shown in Fig. 2.

The internal connection diagram, Fig. 1, has a table which lists the connections made to each card position. It also lists which type of card is used in that position. The Type A104 has A contact outputs, and the Type A105 has B contact outputs.

TESTING

GENERAL

The DLA52E is usually supplied from the factory mounted in a static relay equipment. All units for a given terminal of static relaying are tested together at the factory and each has the same summary number stamped on its nameplate. When the DLA is furnished as a separate unit, it should be interconnected with the associated relay equipment via the shielded plug-in cables prior to testing.

INSTALLATION TESTS

WARNING: THE LOGIC SYSTEM SIDE OF THE DC POWER SUPPLY USED WITH MOD III STATIC RELAY EQUIPMENT IS ISOLATED FROM GROUND. IT IS A DESIGN CHARACTERISTIC OF MOST ELECTRONIC INSTRUMENTS THAT ONE OF THE SIGNAL INPUT TERMINALS IS CONNECTED TO THE INSTRUMENT CHASSIS. IF THE INSTRUMENT USED TO TEST THE RELAY EQUIPMENT IS ISOLATED FROM GROUND, ITS CHASSIS MAY HAVE AN ELECTRICAL POTENTIAL WITH RESPECT TO GROUND. THE USE OF A TEST INSTRUMENT WITH A GROUNDED CHASSIS WILL NOT AFFECT THE TESTING OF THE EQUIPMENT. HOWEVER, A SECOND GROUND CONNECTION TO THE EQUIPMENT, SUCH AS A TEST LEAD INADVERTENTLY DROPPING AGAINST THE RELAY CASE, MAY CAUSE DAMAGE TO THE LOGIC CIRCUITRY. NO EXTERNAL TEST EQUIPMENT SHOULD BE LEFT CONNECTED TO THE STATIC RELAYS WHEN THEY ARE IN PROTECTIVE SERVICE, SINCE TEST EQUIPMENT GROUNDING REDUCES THE EFFECTIVENESS OF THE ISOLATION PROVIDED.

Since the DLA52E logic sections are basically transistor switches, adjustments are neither provided nor required. The various functions that are monitored and therefore serve as inputs to the DLA are covered in the overall logic diagram and descriptive writeup furnished with each equipment.
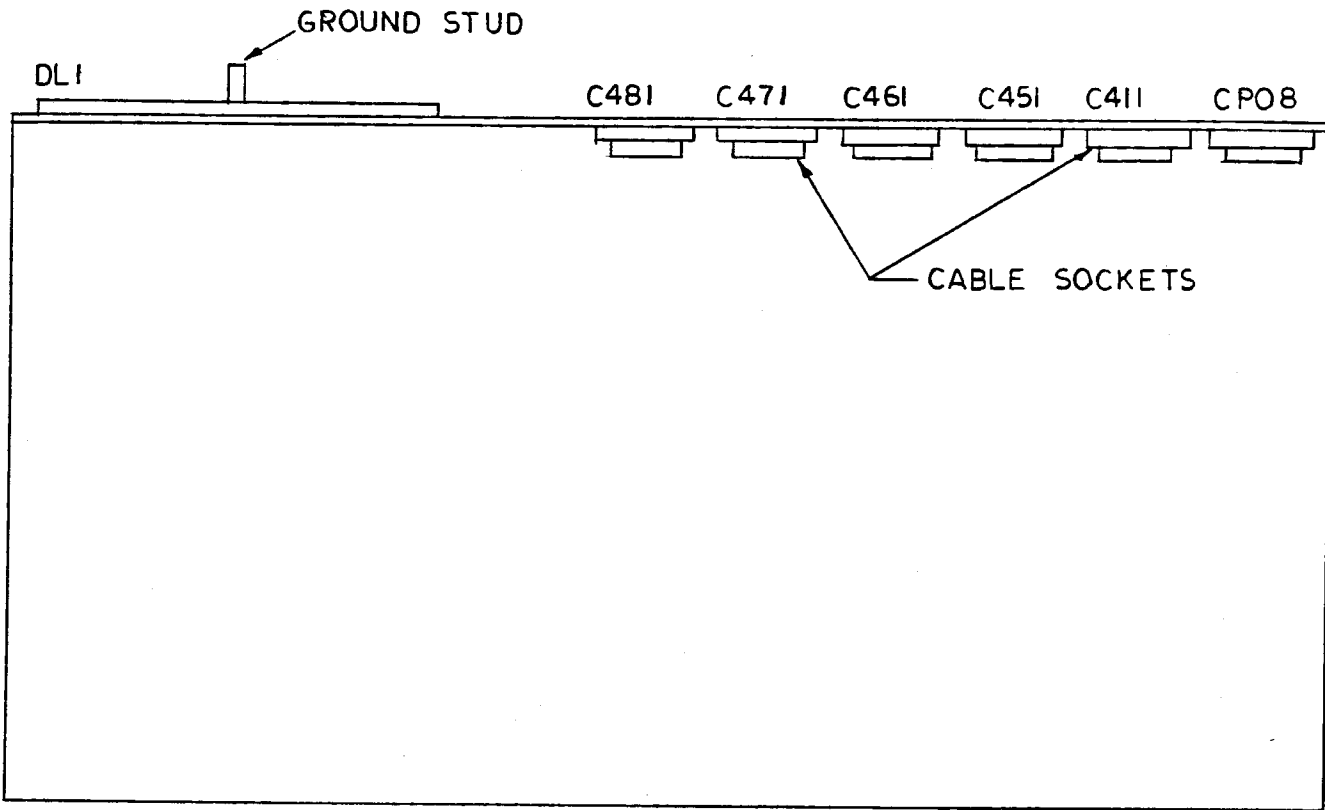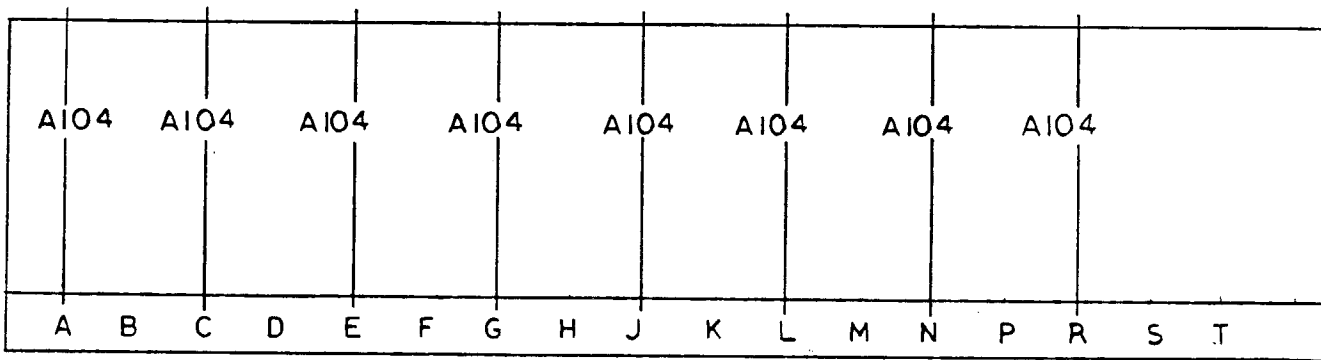
MAINTENANCE

PERIODIC TESTS

It should be sufficient to check the DLA outputs by observing oscillograph operation during periodic calibration tests made on the associated measuring units of the relaying scheme. No separate periodic tests of the DLA itself should be required.

TROUBLESHOOTING

By signal tracing using the overall logic diagram and the various equipment test points, it should be possible to quickly isolate a DLA malfunction. A test adapter card, 0108B9643G2, is supplied with each static relay equipment to supplement the test points provided on each amplifier card. Use of the adapter card is described in the card instruction book GEK-34158.

Fig. 2 (0227A2036-0) Outline and Mounting Dimensions for the DLA52E Relay

GROUND STUD

DL1

C481   C471   C461   C451   C411   CPO8

CABLE SOCKETS

PLAN VIEW

A104   A104   A104   A104   A104   A104   A104   A104

A B C D E F G H J K L M N P R S T

FRONT VIEW
COVER REMOVED

Fig. 3 (0285A5752-0) Component Location Diagram for the DLA52E Relay