REVISIONS

CIRCUIT BOARD REVISION #1

I. CIRCUIT DESCRIPTION

The First Hit Detection Circuit determines which fault occurred first in a series of system faults, thus helping to locate the cause of outages and of other system malfunctions.

The 37 inputs to the board are divided in three groups. The board is capable of determining which circuit was first hit in each group separately. In addition it determines which group was first hit and which second.

All relays on the board have 24VDC coils. In each group some of the inputs are 24VDC signals and the rest 125VDC signals. The 125VDC signals are accomodated by having a 1.2K Ohm resistor in series with the corresponding relay coils for each group.

All inputs except one correspond to NO contacts (voltage is applied when fault occurs). TBI-6 input corresponds to a NC contact (voltage is removed when the fault occurs). A complete list of inputs can be found in Table I, Section II. When the first fault in a group occurs, the corresponding KL relay is energized and latched magnetically; this turns a corresponding indicating lamp on and energizes K3 in the case of group 1, K4 in the case of group 2, or K5 & K6 in the case of group 3. These relays prevent additional KL relays in the same group from being energized. (These statements should be modified somehow to apply to the case of TB1-6; here instead of a KL relay, K13 is used and is latched electrically)

The voltages to K3,4,5, and 6 are fed also to the group sequence logic portion of the circuit board (KL37 to KL45 etc.), which determines the group sequence. The outputs of this group are as follows (to be used for indicating lamps):

Group 1	1st Hit:	TB3-49
Group 2	1st Hit:	TB3-47
Group 3	1st Hit:	TB3-51
Group 1	2nd Hit:	TB3-46
Group 2	2nd Hit:	TB3-50
Group 3	2nd Hit:	TB3-48

ACTIVE FOR GL
BY EC DATE 7/11/97

The circuit is reset by connecting TB2-30 to TB2-31.

273-2
273-12
273-71
273-13
273-221
273-227
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II. CIRCUIT SPECIFICATIONS

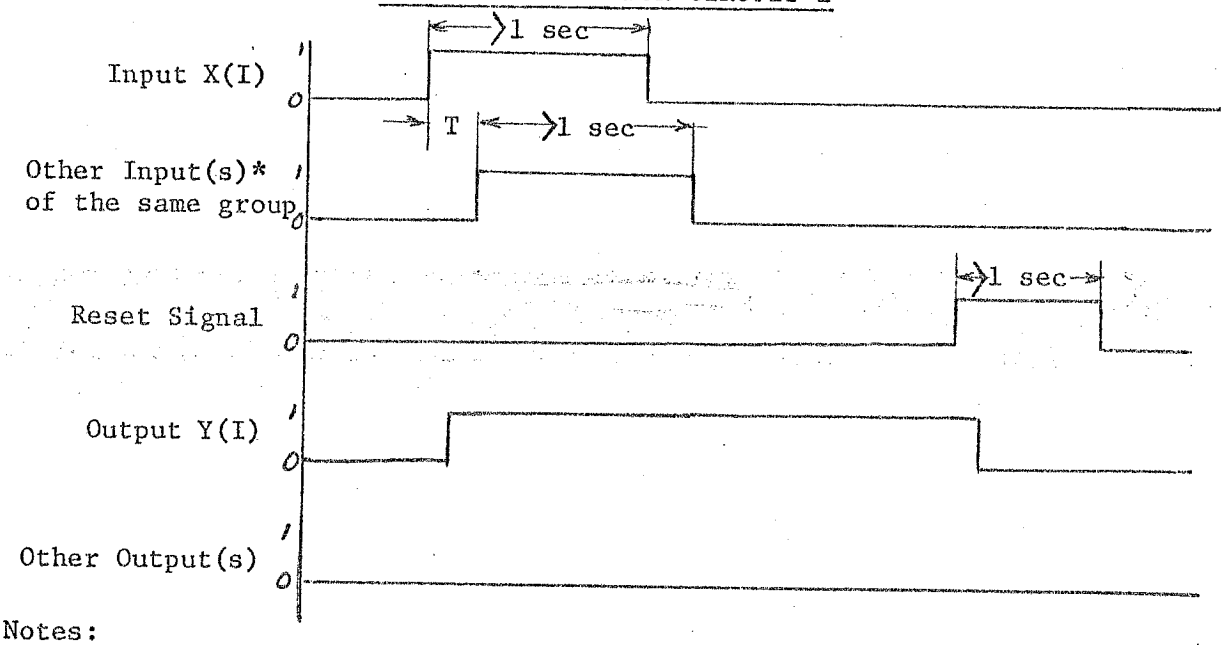
1. Diode redundancy

   Before coating the board, each diode should be tested in the reverse direction to insure redundancy is effective.

2. Individual circuit sequence **

   Each of the 37 circuits should conform with the following timing diagram:

TIMING DIAGRAM FOR CIRCUIT I



Notes:

- For each circuit I, the input X(I), output Y(I) and the meaning of input levels 0 & 1 are given by Table I.
- Meaning of output levels (all circuits): 0:0V
  1:24V
- Meaning of reset signal levels: 1:TB2-31 connected to TB2-30
  0:TB2-31 disconnected
- T = 8 msec (all circuits except 23)
  T = 10 msec (circuit 23)
- Times not shown are insignificant
- * For each I, other circuits can be all other circuits of the same group simultaneously or some or one of these.

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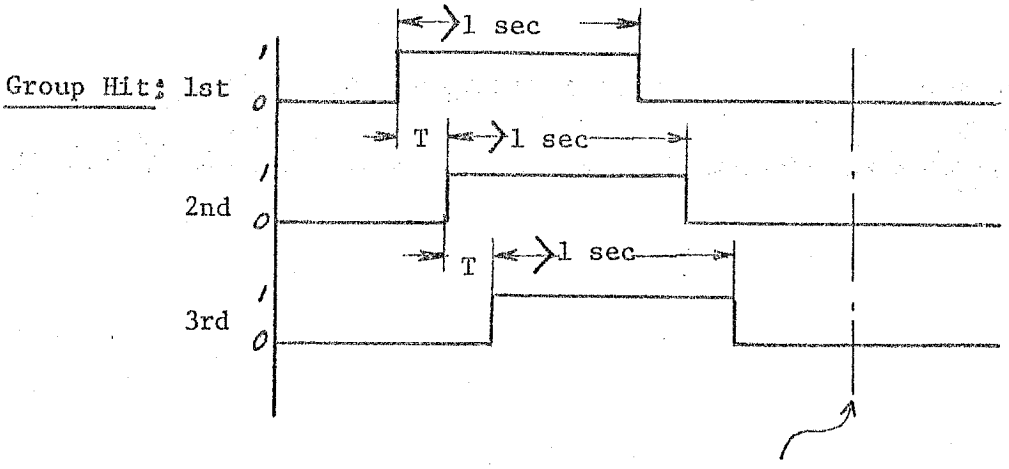
3. Group Sequence **

This part of the circuit should conform with the following table.

Group Hit			Correct Output at TB3-						
1st	2nd	3rd	46	47	48	49	50	51	58
1	2	3	0	0	0	1	1	0	1
1	3	2	0	0	1	1	0	0	1
2	1	3	1	1	0	0	0	0	1
2	3	1	0	1	1	0	0	0	1
3	1	2	1	0	0	0	0	1	1
3	2	1	0	0	0	0	1	1	1

In this table and in the following diagram, 1st, 2nd and 3rd refer to sequence number, and 1,2,3 to group number.



T = 10 msec

Output observation time

** Note: For Parts 2 & 3 the following connections should be made:

TB1-1	24VDC
TB1-2	24V Common
TB4-61	125VDC
TB4-62	125V Common

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REVISIONS

TEST INSTRUCTIONS PREPARED BY: D. Economou DATE 8/29/1973

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EHC DESIGN ENGINEERING

APPROVED BY: P C Callan DATE 9-6-77

P.C. Callan - MANAGER
EHC DESIGN ENGINEERING

TEST PROCEDURE REVIEWED BY R. Debertolis DATE 9/6/77

R. Debertolis
EHC TEST ENGINEER

PRINTS TO

MADE BY J. Polacek Sept. 16, 1977	APPROVALS	STEAM TURBINE DIV OR DEPT.	P3K-AL-0379-A01
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Circuit I	Group	Input X(I)	Output Y(I)	Meaning of levels for input X(I) 0 (No Fault)	1 (Fault)
1	1	TB4-63	TB1-7	0V	125V
2		" -64	" -8	0V	125V
3		" -65	" -9	0V	125V
4		" -66	" -10	0V	125V
5		" -67	" -11	0V	125V
6		" -68	" -12	0V	125V
7		" -69	" -13	0V	125V
8		" -70	" -14	0V	125V
9		" -71	" -15	0V	125V
10		" -72	" -16	0V	125V
11		" -73 ✓	" -17	0V	125V
12		" -74	" -18	0V	125V
13		" -75	" -19	0V	125V
14		" -76	" -20	0V	125V
15		" -77	" -21	0V	125V
16		" -78	" -22	0V	125V
17		" -79	TB2-23	0V	125V
18		" -80	" -24	0V	125V
19		TB3-59	" -25	0V	24V
20		TB1-3	" -26	0V	24V
21		" -4	" -27	0V	24V
22		" -5	" -28	0V	24V
23	2	" -6	" -29	24V	0V
24		TB4-82	" -32	0V	125V
25		TB5-83	" -33	0V	125V
26		" -84	" -34	0V	125V
27		" -86	" -35	0V	125V
28		TB6-87	" -36	0V	24V
29		" -88	" -37	0V	24V
30		" -89	" -38	0V	24V
31	3	[redacted]60	" -39	0V	[redacted]24V
32		TB3-52	" -40	0V	24V
33		" -53	" -41	0V	24V
34		" -54	" -42	0V	24V
35		" -55	" -43	0V	24V
36		" -56	" -44	0V	24V
37		" -57	TB3-45	0V	24V

TABLE I