

REV. NO.	P3K-AL-0362-A01	TITLE	TEST INSTRUCTIONS FOR PLANT COMMUNICATIONS LOGIC (REMOTE AUTO CONTROL INTERFACE)
CONT ON SHEET	3 SH NO. 2	FIRST MADE FOR	EHC MARK II (PLANT COMMUNICATIONS)
			REVISIONS

## II. CIRCUIT DESCRIPTION (continued)

6. Provide 125 VDC to 24 VDC logic interface for --

- Customer RSM mode select.
- Customer RA GO MANUAL.
- Customer load set runback inputs
- Customer load setbacks.

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BY MC DATE 7/11/97

7. The LAMP TEST diodes and resistors are included on the relay logic card. These logic circuits permit all of the lamps to be tested while the EHC system is in operation. A momentary pushbutton switch labeled LAMP TEST is located on the operating panel for checking the lamps.

## III. CIRCUIT SPECIFICATIONS

- Before the board is coated, each diode of the 8 pairs should be checked (using an ohmmeter) both in the forward and reverse direction to insure that redundancy is effective.
- All functional tests shown in the Logic Testing Table can be made with the board coated as well as uncoated.
- The symbols used in the Logic Testing Table are as follows:

### TABLE SYMBOLS

0 = No voltage applied, or absence of voltage at output terminals and test points, or light off.

1 = Power applied to power input terminals, or presence of power at output terminals and test points, or light on.

J = Jumper the two terminals indicated.

Omission = No change from previous test condition.

4. Before applying power to the circuit board, perform the following continuity checks:

CONTINUITY:

Terminals 1 to 3 to 4 to 20 to 36  
6 to 7 to 8 to 9  
11 to 12  
21 to 22  
~~33 to 34~~  
37 to 39 to 41 to 43

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CONT ON SHEET 2 SHE NO. 1		FIRST MADE FOR EHC MARK II (PLANT COMMUNICATIONS)			
<p>I. <u>SCOPE</u></p> <p>This instruction outlines the specifications for testing the Plant Communications Logic board 1PC2-C001.</p> <p>CIRCUIT BOARD 118D1581 -- REMOTE AUTO CONTROL INTERFACE</p> <p>II. <u>CIRCUIT DESCRIPTION</u></p> <ol style="list-style-type: none"><li>1. When the power to the EHC control system is initially turned on, the unit will be in a TRIPPED condition with the circuit breaker open. The circuit breaker OPEN lights will be lit, if the disconnect switch is closed. Several circuits are supplied with circuit breaker open indication. Normally all other functions will be off or neutral.</li><li>2. Indication is furnished to Trip and Monitoring (TM) circuits of the presence of EHC 125 VDC to be supplied to the customer for his contacts to use to power EHC interface relays for the following functions ---<ol style="list-style-type: none"><li>a. Four independent load setbacks.</li><li>b. Remote speed match mode select.</li><li>c. Remote auto (RA) GO MANUAL.</li><li>d. Load set runback circuit.</li></ol></li><li>3. The effect to EHC and the turbine-generator is the same if the disconnect switch is open or both circuit breakers are open. The circuit takes this into account. The same circuit board is used when the customer has only one circuit breaker. External connections take care of the differences.</li><li>4. Because of the EHC features that Speed Control (S) locks into rated speed whenever the circuit breaker is closed, it is imperative that the circuit breaker condition signal get to S. Therefore no switch is inserted between 125 VDC power and these circuits.</li><li>5. <u>Provides the 115 VAC connections to RA, remote operation RO and remote speed match (RSM) at the dictates of the mode selection.</u></li></ol>				REVISIONS	
ET-273					
273-2					
273-12					
273-133					
273-71					
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TEST INSTRUCTIONS FOR PLANT COMMUNICATIONS  
LOGIC (REMOTE AUTO CONTROL INTERFACE)  
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REVISIONS

REMOTE AUTO CONTROL INTERFACE LOGIC TESTING TABLE  
(TEST IN SEQUENCE SHOWN)

Step No.	FUNCTION UNDER TEST	POWER INPUTS			JUMPERS				POWER OUTPUTS				LAMPS			
		Rated Speed not Sel.	System reset	Lamp Test	Disconnect sw. open	#1 breaker open	#2 breaker open	RSM mode selected	Permission to RSM	Ckt. bkr. open	Reset and ckt. bkr. open to S	No customer control power	#1 ckt. bkr. open	#1 ckt. bkr. closed	#2 ckt. bkr. open	#2 ckt. bkr. closed
		10	11	14	39	41	43	53					23	24	25	26
1	All power off	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2	Disconnect sw. open	1			J					1		35 1				
3	System Reset		1								1					
4	Lamp Test			1									1	1	1	1
5	Disconnect sw. closed, ckt. bkrs. open			0	0	J	J							0		0
6	RSM selected	1	1	0	0	J	J	J	0	1	1	0	1	0	1	0
7	Rated Speed selected	0							1			0				
8	#1 ckt. bkr. closed					0		0	0	0	0		0	1		
9	#2 ckt. bkr. closed					J	0						1	0	0	1
10	Both ckt. bkrs. closed					0							0	1		

(TABLE CONTINUED ON NEXT PAGE)

During the above tests there should be no power on any other terminals.  
Leave the circuit powered as in Step #10 and proceed to next test.

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TEST INSTRUCTIONS FOR PLANT COMMUNICATIONS  
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FIRST MADE FOR EHC MARK II (PLANT COMMUNICATIONS)

REVISIONS

(TABLE CONTINUED FROM PREVIOUS PAGE)

TEST POINTS							
TP50	TP51	TP52	TP53	TP54	TP55	TP56	TP57
50	51	52	53	54	55	56	57
0	0	0	0	0	0	0	0
1		1		1		1	
1		1		1		1	
	1						
0	0	0		0	1		
1		1		1	0	0	1
0		0		0	1		

Step No.

1  
2  
3  
4  
5  
6  
7  
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9  
10

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TEST INSTRUCTIONS FOR PLANT COMMUNICATIONS  
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Step No.	FUNCTION UNDER TEST	RA POWER		JUMPERS						POWER OUTPUTS					
		+125 VDC	125 VDC common	#1 setback	#2 setback	#3 setback	#4 setback	Runback decrease	Increase prevent	RA +125 VDC lost	#1 setback	#2 setback	#3 setback	#4 setback	Load runback
		62	61	45	47	49	51	57	57	20	27	28	29	30	31
				46	48	50	52	58	60						
11	Put RA power on	1	1							0					
12	#1 load setback			J							1				
13	#2 load setback			0	J						0	1			
14	#3 load setback				0	J						0	1		
15	#4 load setback					0	J						0	1	
16	Load runback decrease						0	J						0	1
17	Load runback increase prevent							0	J						0
18	Clear								0						0

Leave the ckt. powered as in step #18 and proceed to next test.

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FIRST MADE FOR EHC MARK II (PLANT COMMUNICATIONS)

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Step No.	FUNCTION UNDER TEST	POWER			115VAC between terminals	JUMPERS								+24 VDC output	115VAC OUTPUT BETWEEN TERMINALS				
		RSM permission	RA permission	RO permission		RA GO MANUAL	RSM increase	RSM decrease	RA increase	RA decrease	RO increase	RO decrease	Load set decrease		Load set increase	RSM AC power	RA AC power	RO AC power	
		17	18	19		63 64	55 56	67 68	68 69	71 72	72 73	75 76	76 77		63 65	63 66	68 70	72 74	76 78
19	115VAC power on				1														
20	RSM permission	1															1		
21	RSM increase						J									1			
22	RSM decrease						0	J							1	0			
23	RA permission	0	1					0							0		0	1	
24	RA increase								J							1			
25	RA decrease								0	J					1	0			
26	RA GO MANUAL					J				0				1	0				
27	RO permission		0	1		0								0				0	1
28	RO increase										J					1			
29	RO decrease										0	J			1	0			
30	Clear			0	0							0			0				0

Leave +125 VDC power on terminals 37 &amp; 38 and proceed to next step.

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TEST INSTRUCTIONS FOR PLANT COMMUNICATIONS  
LOGIC (REMOTE AUTO CONTROL INTERFACE)

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FIRST MADE FOR EHC MARK II (PLANT COMMUNICATIONS)

REVISIONS

Step No.	FUNCTION UNDER TEST	POWER INPUTS				Jumpers		POWER OUTPUTS			Test Points
		+24 VDC	24 VDC	SPL Inc. from RO	SPL Dec. from RO	SPL Inc.	SPL Dec.	Inc. to SPL	Dec. to SPL	SPL Permission	
		1	2	21	33	79	80	22	34	36	53
31	+24 VDC Power Off	0	0	0	0	0	0	0	0	0	0
32	+24 VDC Power On	1	1							1	
33	+24 VDC from RO Inc.			1				1	0		1
34	Remove RO Inc.			0				0			
35	Remove power	0									0
36	Reapply Power	1								1	
37	+24 VDC from RO Dec.				1				1	0	1
38	Remove RO Dec.				0				0		
39	SPL Inc.					J		1			
40	SPL Dec.					0	J	0	1		
41	SPL Clear						0		0		
42	Remove power	0									0
43	Reapply Power	1								1	
44	Clear	0	0							0	

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LOGIC (Remote Auto Control Interface)  
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TABLE A

PROCEDURE	L1	L2	L3	L4	L5	L6	L7	L8	L9	L10	L11	L12	L13
1 All Switches Down	X	X		X	X	X	X	X	X	X	X	X	X
2 S1 up	X	X		X	X	X	X	X	X	X	X	X	X
3 S4, S5 up	X	X		X	X	X	X	X	X	X	X	X	X
4 S2 up	X	X		X	X	X	X	X	X	X	X	X	X
5 S3 up	X	X		X	X	X	X	X	X	X	X	X	X
6 S3 down	X	X		X	X	X	X	X	X	X	X	X	X
7 S4, S5 down	X	X		X	X	X	X	X	X	X	X	X	X
8 S6, S7 up	X	X		X	X	X	X	X	X	X	X	X	X
9 S8, S9 up	X	X		X	X	X	X	X	X	X	X	X	X
10 Check for +24 VDC at TP50, 52, 54 & 56	X	X		X	X	X	X	X	X	X	X	X	X
11 S10, S11 up	X	X		X	X	X	X	X	X	X	X	X	X
12 S1 down	X	X		X	X	X	X	X	X	X	X	X	X
13 Check for +24 VDC at TP51	X	X		X	X	X	X	X	X	X	X	X	X
14 S6, S7 down	X	X		X	X	X	X	X	X	X	X	X	X
15 S8, S9 down	X	X		X	X	X	X	X	X	X	X	X	X
16 S10, S11 down	X	X		X	X	X	X	X	X	X	X	X	X

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<p>3. Refer to Figure B for test circuit.</p> <p>4. Test the relay logic for section 2 according to Table B.</p>				REVISION	
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TABLE B																REVISION
PROCEDURE	L1	L2	L3	L4	L5	L6	L7	L8	L9	L10	L11	L12				
1 All Switches Down	X															
2 S1 up		X														
3 S2 up, S3 up		X	X													
4 S2 down, S3 down		X														
5 S4 up, S5 up		X		X												
6 S4 down, S5 down		X														
7 S6 up, S7 up		X			X											
8 S6 down, S7 down		X				X										
9 S8 up, S9 up		X														
10 S8 down, S9 down		X				X										
11 S12 up, S13 up		X					X									
12 S12 down, S13 down		X														
13 S14 up, S15 up		X						X								
14 S14 down, S15 down		X														
15 S10 up, S11 up		X														
16 S10 down, S11 down		X														

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5. Refer to Figure C for test circuit.
6. Test the relay logic for section 3 according to Table C.

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TEST INSTRUCTIONS FOR PLANT COMMUNICATIONS  
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TABLE C

REVIS:

	PROCEDURE	L1	L2	L3	L4	L5	L6	L7	L8	L9	L10	L11	L12	L13	L14
1	All Switches Down														
2	S1 up														
3	S2 up														
4	S7 up	X													
5	S7 down S8 up		X												
6	S8 down S9 up			X											
7	S9 down S10 up				X										
8	S10 down														
9	S2 down														
10	S3 up														
11	S7 up														
12	S7 down S8 up														
13	S8 down S9 up														
14	S9 down S10 up														
15	S10 down														
16	S3 down														



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TABLE C.

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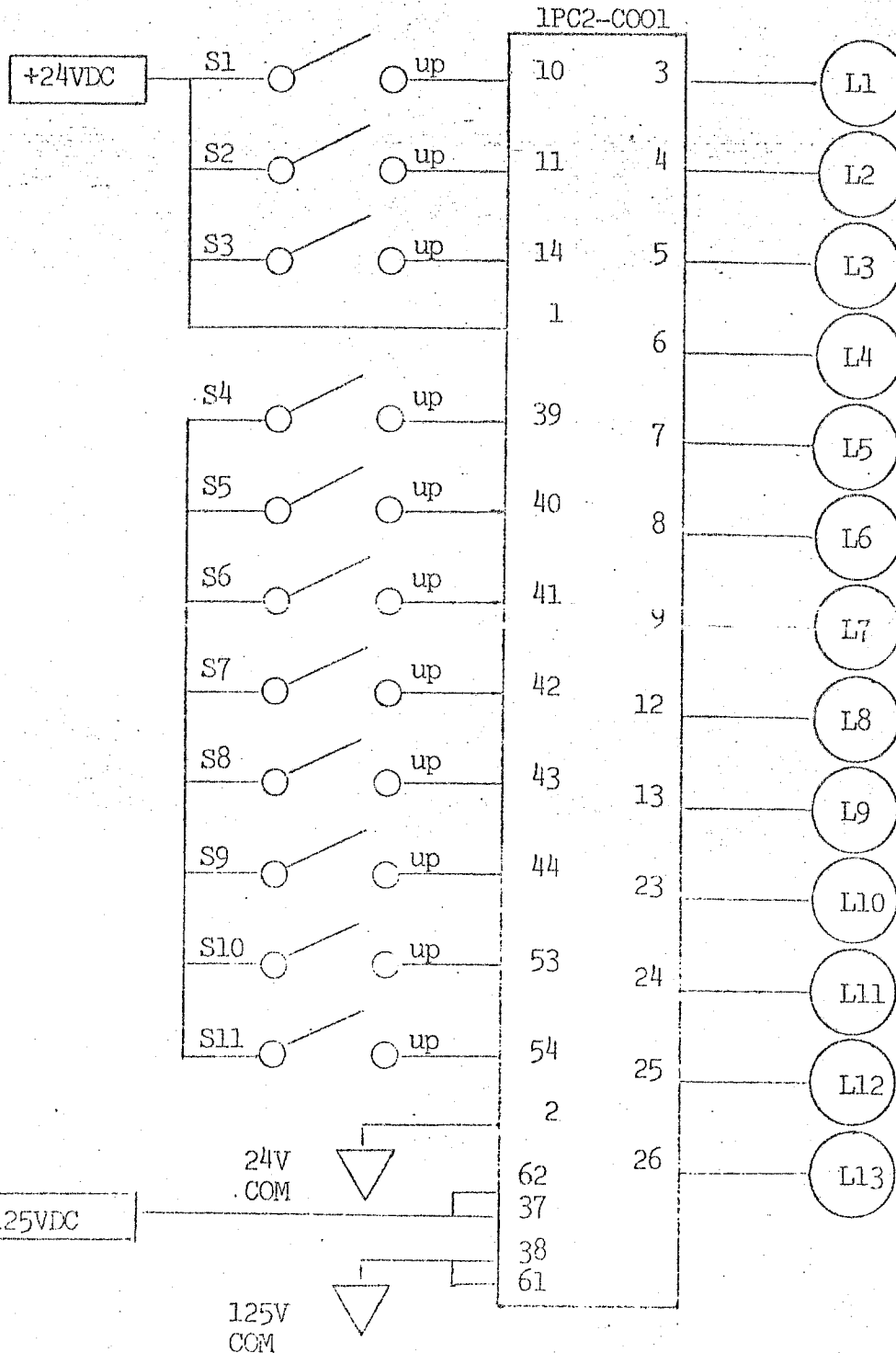


FIGURE A

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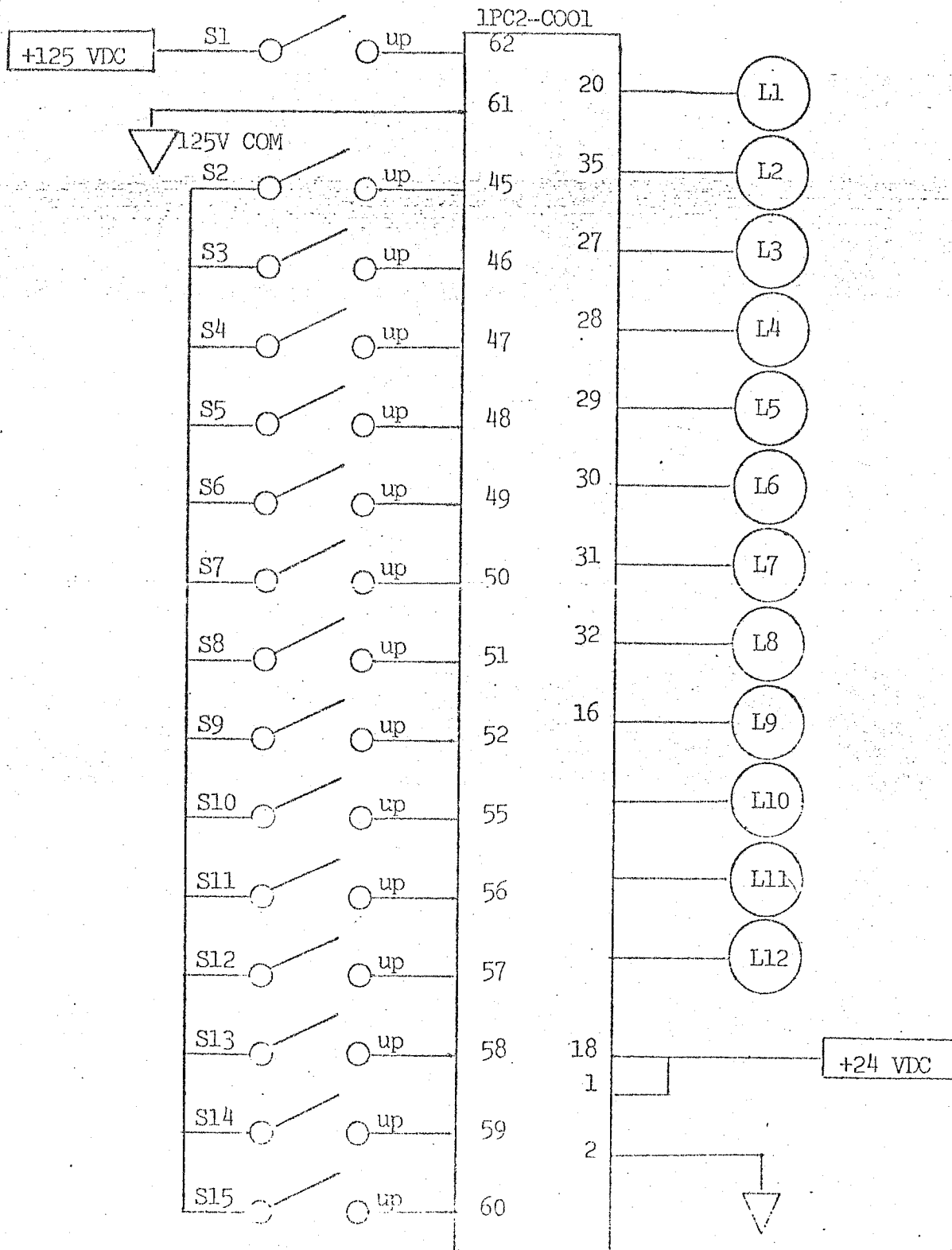


FIGURE B

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LOGIC (Remote Auto Control Interface)

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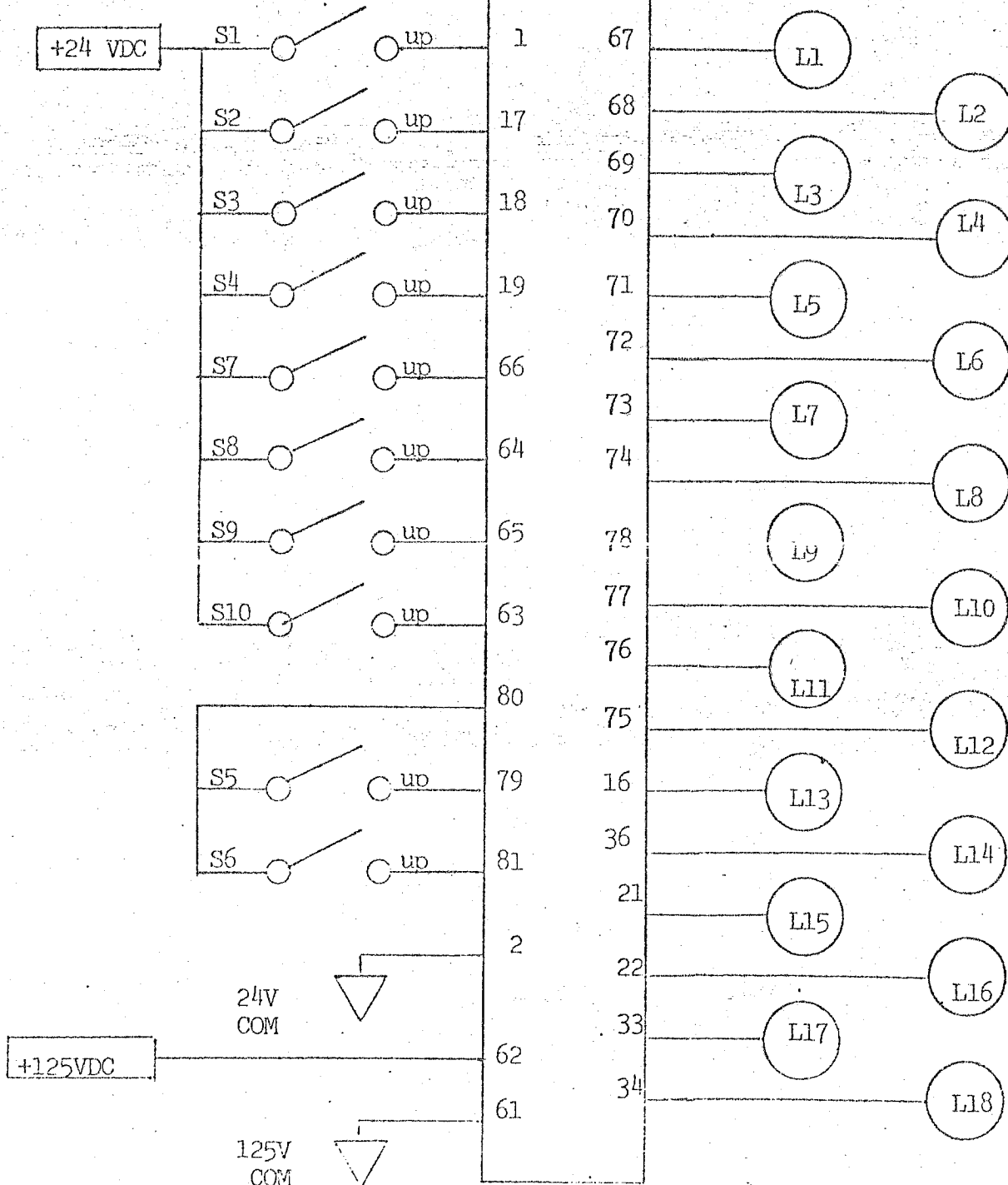


FIGURE C

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LOGIC (REMOTE AUTO CONTROL INTERFACE)  
FIRST MADE FOR EHC MARK II (PLANT COMMUNICATIONS)

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REVISIONS

PREPARED BY

*George W. Kessler*

DATE

*5/7/73*G.W. Kessler  
EHC DESIGN ENGINEERING

APPROVED BY

*P.C. Callan*

DATE

*1-13-75*P.C. Callan - MANAGER  
EHC DESIGN ENGINEERING

TEST PROCEDURE

PREPARED BY

*Carl R. Bugg*

DATE

*11-12-74*C. Bugg  
EHC TEST ENGINEER

TEST PROCEDURE

APPROVED BY

*George W. Kessler*

DATE

*1/6/75*

G.W. Kessler - EHC DESIGN ENGINEERING

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