

APPENDIX A ERROR CODES

When the MICRO 84 system detects an error, the letter E and the corresponding error code (00-99) appear in the data display. The system detects errors in both the controller and the programmer. Controller errors (e.g., communications, logic, etc.) require that the controller be restarted. This is accomplished using the SHIFT and RESET keys on the programmer. Programmer errors (e.g., an illegal sequence of keystrokes is entered) require using the RESET key only.

Table A-1 lists the error codes, their meaning, and remedy. The asterisk that follows some of the error codes indicates that the error is a controller error. The other errors are P370 Programmer errors.

Table A-1. Error Messages

ERROR CODE	MEANING	REMEDY
60*	A diagnostic error has occurred in the controller's RAM or ROM memory.	<ol style="list-style-type: none"> 1. Restart Controller—(SHIFT/RESET) If the error does not reoccur, system is OK. 2. If the error reoccurs after restarting and user logic was just loaded from a program pack, reload making sure the program pack is correctly and firmly inserted. If the error reoccurs, clear the controller memory (SUPV3) and restart controller (SUPV2). If controller runs (RUN light on), program pack contains garbled logic or pack itself is bad. Reload program pack with known good logic and reattempt. Could also be caused by using the wrong program pack/controller combination (memory size mismatch). 3. If error reoccurs after attempting to restart, and program pack has not been used to load new logic, a hardware problem exists (call your distributor).
61*	An error has occurred in the Input/Output section of the controller.	<ol style="list-style-type: none"> 1. Check to ascertain proper installation of terminator plug (see Section 3). Retry. 2. Bad controller. Remove all I/O modules, insert terminator plug in controller. Retry. If no error, controller is good. 3. Bad I/O module. Reinstall the modules (and terminator plug) removed in step 2 one at a time, and retry. Error will occur when faulty I/O module is installed. Replace the module.
<p>*To clear errors with an asterisk, press SHIFT/RESET; errors without an asterisk, press RESET. (All errors can be cleared using the SHIFT/RESET sequence.)</p>		

Table A-1. Error Messages (Cont)

ERROR CODE	MEANING	REMEDY
62*	An error is detected in user logic during the power up sequence.	<ol style="list-style-type: none"> 1. Reattempt to start the controller from the programmer (SHIFT/RESET). 2. Reload the user logic from the program pack. 3. Clear controller memory (SUPV1, SUPV3, then SUPV2 and reprogram the controller.
63*	A message from the programmer to the controller arrived garbled.	<ol style="list-style-type: none"> 1. Check cable connections between programmer and controller and retry. 2. Retry using another programmer.
64*	A message sent by the programmer has taken too long to get to the controller.	<ol style="list-style-type: none"> 1. Check cable connections between programmer and controller and retry. 2. Retry using another programmer.
65*	The transfer of user logic between the program pack and the controller (or vice-versa) was not successful.	<ol style="list-style-type: none"> 1. Check that program pack is inserted correctly and retry. 2. When loading the controller, this message indicates that controller memory is bad. 3. When dumping to the program pack, this message indicates that program pack is faulty.
66*	Insufficient power (less than 100 (or 200) VAC).	If there is insufficient power, data cannot be entered into the controller (i.e., user logic cannot be altered). The controller will continue to function normally and the P370 Programmer will operate in the Examine, Supervisory, and Error modes.
67	An attempt has been made to disable a coil (00XX) and the cursor is not positioned on top of a coil.	Move cursor to appropriate element and retry. Coil contacts cannot be individually disabled. They are all disabled when the coil is disabled.
68	An attempt was made to force a coil or input contact that was not previously disabled.	Disable the element and retry.
70*	A message sent by the controller has taken too long to get to the programmer.	<ol style="list-style-type: none"> 1. Check cable connections between the programmer and controller and retry. 2. Retry using another programmer.
71*	A message from the controller to the programmer arrived garbled.	<ol style="list-style-type: none"> 1. Check cable connections between the programmer and controller and retry. 2. Retry using another programmer.

*To clear errors with an asterisk, press SHIFT/RESET; errors without an asterisk, press RESET. (All errors can be cleared using the SHIFT/RESET sequence.)

Table A-1. Error Messages (Cont)

ERROR CODE	MEANING	REMEDY
73*	A diagnostic error has been detected in the programmer ROM.	This error may occur when a programmer is plugged into the controller for the first time. Press SHIFT/RESET. If the error reoccurs, try another programmer.
75*	A diagnostic error has been detected in the programmer RAM.	Try another programmer.
76	An illegal sequence of keystrokes was entered for a Search	The proper sequence is: Search Type, SRCH key, Reference Number (or Element Type), SRCH key.
77	An illegal Search Type code or Reference Number was entered in a Search request.	Retry using proper Search Type code and Reference Number.
78	An attempt has been made to Search without specifying a Search Type code or Reference Number.	Retry using proper Search Type code and Reference Number.
79	The search for the specified logic element was unsuccessful.	Retry.
80	Illegal entry of vertical connector.	A vertical connector cannot be used in the fourth row or seventh column.
81	The controller was not stopped before function was attempted.	Controller must be stopped to either Clear or Dump memory.
82	An attempt was made to disable an element that cannot be disabled.	Only coils (00XX) and input contacts (10XX) can be disabled.
83	An attempt was made to enter a logic element but no logic element was included in the Enter sequence.	Retry using proper keystrokes.
84	An attempt was made to enter a logic element but no preset (double-node elements) and/or reference number was included in the Enter sequence.	Retry using proper keystrokes.
<p>*To clear errors with an asterisk, press SHIFT/RESET; errors without an asterisk, press RESET. (All errors can be cleared using the SHIFT/RESET sequence.)</p>		

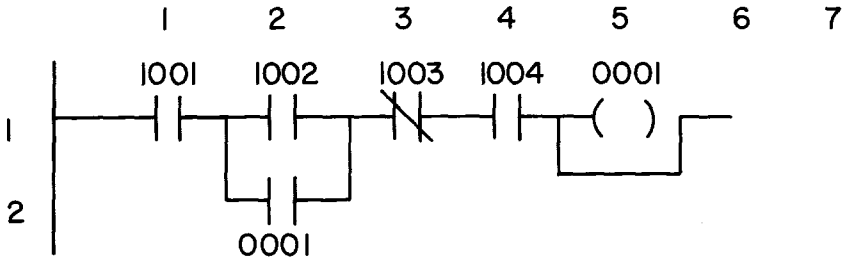
Table A-1. Error Messages (Cont)

















ERROR CODE	MEANING	REMEDY
85	An invalid network number was entered.	The MICRO 84 can have 1-9 or 1-18 networks depending upon the memory size.
87	An out-of-range or invalid reference number has been entered.	Retry using a valid reference number.
88	The data value entered was greater than 999.	Retry using data value equal to or less than 999.
89	Memory is protected.	The keylock switch key is in the vertical position or has been removed.
92	Illegal entry of logic element was attempted.	See "Logic Element Entry Rules" in Section 6.
93	Double node logic element entered in an illegal position.	See "Logic Element Entry Rules" in Section 6.
94	A wrong reference number has been entered for an element type (e.g., a 40XX reference has been entered for a coil).	Correct and retry.
95	The same reference number has been entered for two coils.	Coil reference numbers must be unique. Retry using unique reference number.

APPENDIX B PROGRAM LOGIC EXAMPLES

This Appendix contains several typical program logic examples including the ladder logic diagram and the actual keystrokes required to enter the logic into the MICRO 84 Programmable Controller. The keystrokes are entered using a P370 Programmer that is connected to the MICRO 84 mainframe. All examples start with the cursor in row 1, column 1.

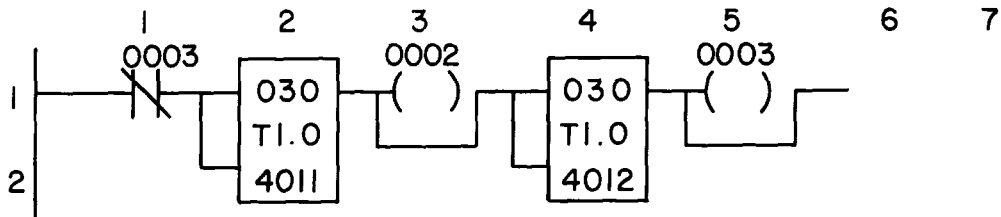
B.1 MOTOR CONTROL SEAL CIRCUIT












<u>STEP</u>	<u>KEYSTROKES</u>	<u>COMMENTS</u>
1	1001   ENTER	Enter NO contact 1001 with vertical connector.
2		Move cursor to 1,2.
3	1002   ENTER	Enter NO contact 1002 with vertical connector.
4		Move cursor to 2,2.
5	0001  ENTER	Enter NO contact 0001.
6	  OR  	Move cursor to 1,3.
7	1003  ENTER	Enter NC contact 1003.
8		Move cursor to 1,4.
9	1004  ENTER	Enter NO contact 1004.
10		Move cursor to 1,5.
11	0001  ENTER	Enter coil 0001.

B.2 OSCILLATOR

Coil 0002 is OFF for 30 seconds and then ON for 30 seconds.

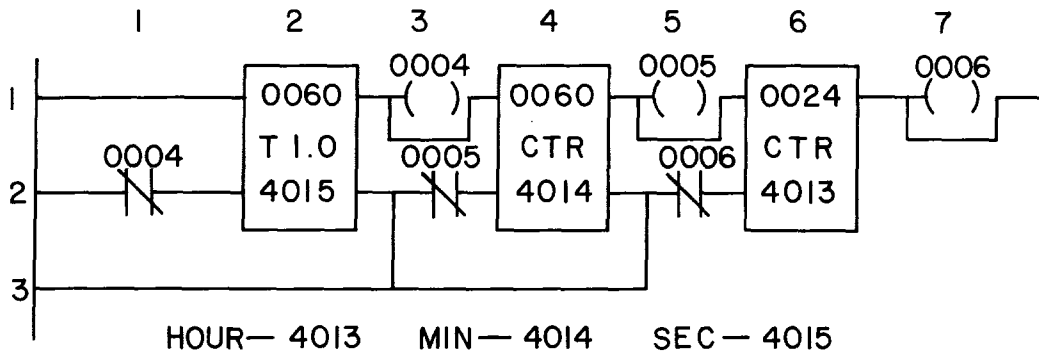


STEP	KEYSTROKES	COMMENTS
1	0003   ENTER	Enter NC contact 0003 with vertical connector.
2		Move cursor to 1,2.
3	0030 SHIFT T1.0 4011 ENTER	Enter 1 second timer 4011 with 30 second preset.
4		Move cursor to 1,3.
5	0002   ENTER	Enter coi1 0002 with a vertical connection.
6		Move cursor to 1,4.
7	0030 SHIFT T1.0 4012 ENTER	Enter 1 second timer 4012 with 30 second preset.
8		Move cursor to 1,5.
9	0003  ENTER	Enter coil 0003.

To check oscillator operation:

10	4011 SHIFT DEFINE A	Define A key to 4011.
11	CLEAR	Clear data area.
12	A	Get 4011 and monitor timer.

B.3 REAL-TIME CLOCK

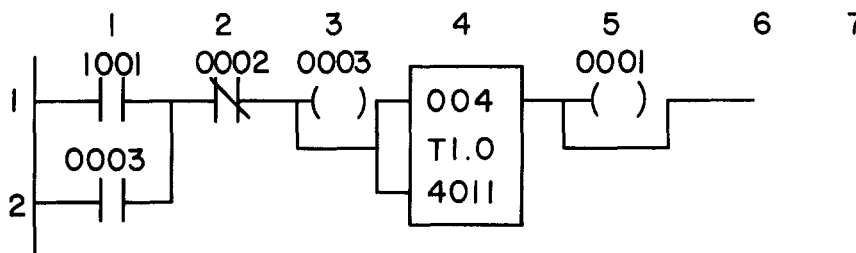


STEP	KEYSTROKES	COMMENTS
1	ENTER	Enter horizontal connector.
2		Move cursor to 2,1.
3	0004 ENTER	Enter NC contact 0004.
4		Move cursor to 3,1.
5	ENTER	Enter horizontal connector.
6		Move cursor to 1,2.
7	0060 SHIFT T1.0 4015 ENTER	Enter 1 second timer 4015 with preset of 60 seconds and vertical connector.
8		Move cursor to 3,2.
9	ENTER	Enter horizontal connection.
10		Move cursor to 1,3.
11	0004 ENTER	Enter coil 0004.
12		Move cursor to 2,3.
13	0005 ENTER	Enter NC contact 0005.
14		Move cursor to 3,3.
15	ENTER	Enter horizontal connector.
16		Move cursor to 1,4.
17	0060 SHIFT CTR 4014 ENTER	Enter counter 4014 with preset of 0060 (minutes) and vertical connector.



STEP	KEYSTROKES	COMMENTS
18		Move cursor to 3,4.
19	ENTER	Enter horizontal connector.
20		Move cursor to 1,5.
21	0005 ENTER	Enter coil 0005.
22		Move cursor to 2,5.
23	0006 ENTER	Enter NC contact 0006.
24		Move cursor to 1,6.
25	0024 SHIFT CTR 4013 ENTER	Enter counter 4013 with preset of 0024 (hours).
26		Move cursor to 1,7.
27	0006 ENTER	Enter coil 0006.

B.4 TIME DELAY CIRCUIT

A four second delay occurs before coil 0001 is activated after pushing pushbutton 1001.

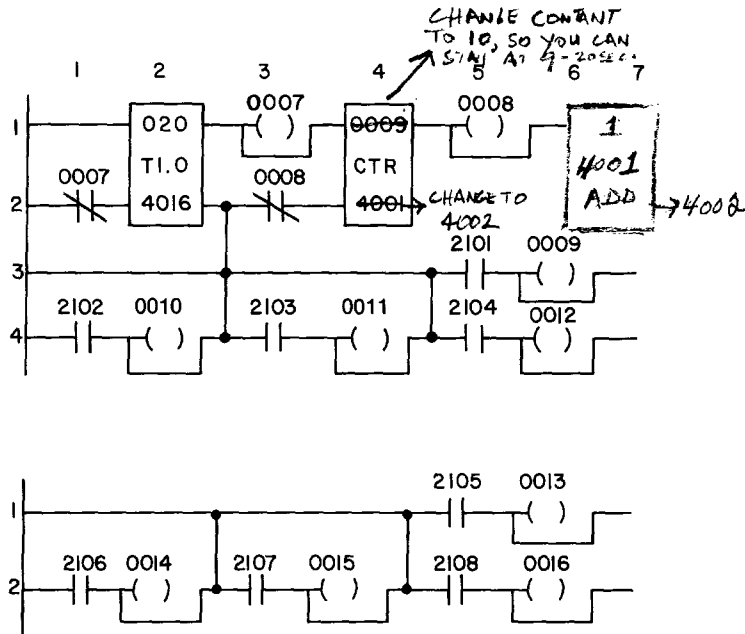


STEP	KEYSTROKES	COMMENTS
1	1001 ENTER	Enter NO contact 1001 with vertical connector.
2		Move cursor to 2,1.
3	0003 ENTER	Enter contact 0003.
4		Move cursor to 1,2.
5	0002 ENTER	Enter NC contact 0002.
6		Move cursor to 1,3.
7	0003 ENTER	Enter coil 0003 with vertical connector.
8		Move cursor to 1,4.

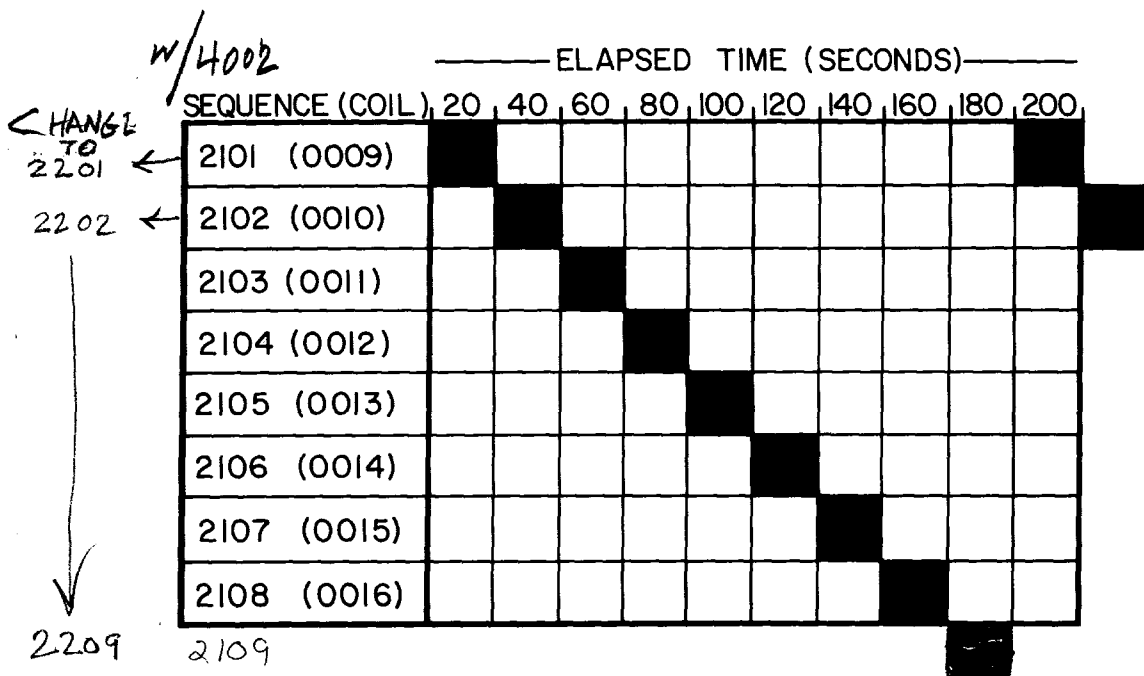
STEP	KEYSTROKES	COMMENTS
9	004 SHIFT T1.0 4011 ENTER	Enter 1 second timer 4011 with preset of 4 seconds.
10		Move cursor to 1,5.
11	0001  ENTER	Enter coil 0001.
































B.5 SEQUENCER (8 STEP)




























This circuit sequentially energizes contacts (and consequently the attached coils) 2101 through 2108. The sequential contacts are made at 20 second intervals (see the chart below).



















* CHANGES REFLECTED FOR USING BLANK SPACE.



<u>STEP</u>	<u>KEYSTROKES</u>	<u>COMMENTS</u>
1	 ENTER	Enter horizontal connection.
2		Move cursor to 1,2.
3	020 SHIFT T1.0 4016  ENTER	Enter 1 second timer 4016 with preset of 20 seconds and vertical connector.
4		Move cursor to 1,3.
5	0007  ENTER	Enter coil 0007.
6		Move cursor to 1,4.
7	009 SHIFT CTR 4001 ENTER	Enter counter 4001 with preset of 9. 4001 is sequencer register and preset value is one more than the number of steps.
8		Move cursor to 1,5.
9	0008  ENTER	Enter coil 0008.
10	    	Move cursor to 2,1.
11	0007  ENTER	Enter NC contact 0007.
12	 	Move cursor to 2,3.
13	0008  ENTER	Enter NC contact 0008.
14	  	Move cursor to 3,1.
15	 ENTER	Enter horizontal connector.
16		Move cursor to 3,2.
17	  ENTER	Enter horizontal and vertical connectors.
18		Move cursor to 3,3.
19	 ENTER	Enter horizontal connector.
20		Move cursor to 3,4.
21	  ENTER	Enter horizontal and vertical connector.
22		Move cursor to 3,5.
23	2101  ENTER	Enter NO contact 2101 (sequencer step 1).

<u>STEP</u>	<u>KEYSTROKES</u>	<u>COMMENTS</u>
24		Move cursor to 3,6.
25	0009  ENTER	Enter coil 0009.
26	  	Move cursor to 4,1 (cursor wraps to column 1).
27	2102  ENTER	Enter NO contact 2102.
28		Move cursor to 4,2.
29	0010  ENTER	Enter coil 0010.
30		Move cursor to 4,3.
31	2103  ENTER	Enter NO contact 2103.
32		Move cursor to 4,4.
33	0011  ENTER	Enter coil 0011.
34		Move cursor to 4,5.
35	2104  ENTER	Enter NO contact 2104.
36		Move cursor to 4,6.
37	0012  ENTER	Enter coil 2104.
38	NET	Go to next network. The cursor is in 1,1.
39	 ENTER	Enter horizontal connector.
40		Move cursor to 1,2.
41	  ENTER	Enter horizontal and vertical connector.
42		Move cursor to 1,3.
43	 ENTER	Enter horizontal connector.
44		Move cursor to 1,4.
45	  ENTER	Enter horizontal and vertical connector.
46		Move cursor to 1,5.
47	2105  ENTER	Enter NO contact 2105.

<u>STEP</u>	<u>KEYSTROKES</u>	<u>COMMENTS</u>
48		Move cursor to 1,6.
49	0013  ENTER	Enter coil 0013.
50	  	Move cursor to 2,1.
51	2106  ENTER	Enter NO contact 2106.
52		Move cursor to 2,2.
53	0014  ENTER	Enter coil 0014.
54		Move cursor to 2,3.
55	2107  ENTER	Enter NO contact 2107.
56		Move cursor to 2,4.
57	0015  ENTER	Enter coil 0015.
58		Move cursor to 2,5.
59	2108  ENTER	Enter NO contact 2108.
60		Move cursor to 2,6.
61	0016  ENTER	Enter coil 0016.