

MULTIPOINT JUNCTION UNITS AND AUXILIARY CIRCUITS MAINTENANCE AND TROUBLESHOOTING PROCEDURES DIGITAL DATA SYSTEM

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1. GENERAL

1.01 This practice contains the procedures for troubleshooting a multipoint junction unit assembly, its auxiliary circuits FDX MJUs (full-duplex multipoint junction units, or referred to as MJUs), clock distribution circuits, and associated circuits. This practice also contains procedures for removing and replacing FDX JCT (junction) CPs (circuit

packs), HL68, HL223, HL224, and HL69 CLKD (clock distribution) CPs.

1.02 This practice is reissued to include information on the new secondary channel HL223 and HL224 circuit packs. Revision arrows are used to emphasize the more significant changes.

1.03 The troubleshooting procedures in this practice are to be used in conjunction with the test procedures in Practice 314-917-500 in order to locate a defective JCT or CLKD CP. Before performing the troubleshooting procedures in this practice, the MJU facilities should have been tested from the test center.

1.04 When a JCT or CLKD CP is found to be defective, it should be removed from the shelf and replaced with a CP that is known to be operating properly. The defective CP should be sent to a distributing house for repair.

1.05 A bay containing MJUs should have a certain quantity of spare CPs in stock. The quantity of spare components will be determined by the number of 2-shelf MJU assemblies. The following will aid in determining the quantity of spare components:

- HL68—One spare per 128 working units
- HL223—One spare per 128 working units
- HL224—One spare per 128 working units
- HL69—One spare per 20 working units.♦

2. TROUBLESHOOTING PROCEDURES

2.01 This part contains troubleshooting flowcharts to aid in locating a defective MJU or CLKD CP. Refer to Table A when using the test points on the faceplate of an MJU during troubleshooting.

Note: Before performing any tests on an MJU, check the rear of the shelf assembly containing the MJU for proper strapping of the HUB ID (hub identification) code. Refer to Table B for the proper strapping on the TS1C (terminal strip) for each HUB ID code.

2.02 Refer to Fig. 1 when troubleshooting an MJU HL68 or to Fig. 2 for MJU HL223/HL224. The tests referred to in Fig. 1 and 2 can be found in Practice 314-917-500. The tests can be performed on a 3-port (2-branch) or 5-port (4-branch) MJU arrangement. If all the MJUs in a 2-shelf MJU arrangement become inoperative, check the 5-V power supply per Practice 314-970-101 before referring to Fig. 1 or 2.

2.03 When testing the entire multipoint network or remotely testing an MJU from a test center, refer to Practices 314-901-300 and 314-901-500 for troubleshooting and testing procedures.

2.04 When one of the two CLKD CPs in a 2-shelf MJU arrangement becomes defective, or the clock signal to the CP is lost or faulty, the minor alarm LED (light-emitting diode) on the faceplate of the CLKD CP will be lighted. When both of the CLKD CPs become defective, or the clock signal to both CPs is lost or faulty, the major alarm LEDs on both CP faceplates will be lighted. If an alarm LED on a CLKD CP is lighted, refer to Fig. 3 to aid in trouble location. Refer to Table C when using the test points on the faceplate of the CLKD CP for checking the CP.

3. MAINTENANCE PROCEDURES

3.01 This part contains procedures for removing and replacing JCT CPs, CLKD CPs, and fuses in an MJU shelf arrangement.

3.02 To remove an HL68, HL223, HL224, or HL69 CP, depress the ejector latch at the base of the faceplate, grasp the CP faceplate, and pull straight out on the CP. To replace a CP, insert the printed circuit boards of the CP into the slots in the shelf and press on the CP faceplate until the ejector latch engages the shelf. When replacing an HL223 CP, set the data rate switch and mark the data rate on the faceplate label.

3.03 To remove a fuse from the fuse panel in an MJU shelf arrangement, remove the fuse holder cap by turning the cap counterclockwise and

extract the fuse from the holder. Replace the defective fuse with a fuse of the same type (70D) by reversing the above procedure.

3.04 For removal and replacement of a 71D or 76D power unit, refer to Practice 314-970-101.

4. MAINTENANCE AIDS

4.01 This part contains a list of reference documents and a list of test equipment to aid in locating a defective JCT or CLKD CP.

4.02 The following is a list of AT&T practices concerning the HL68, HL223, HL224, and HL69 CPs; 71D or 76D power unit; and the BCPA (bay clock, power, and alarms) unit:

PRACTICE	TITLE
314-916-100	Digital Data System—Bay Clock, Power, and Alarms Circuit—Description
314-917-100	Digital Data System—Multipoint Junction Units and Auxiliary Circuits—Description
314-917-500	Digital Data System—Multipoint Junction Units and Auxiliary Circuits—Test Procedures
314-970-101	Digital Data System—5-Volt Power Supply Shelf—Description

4.03 The following is a list of CDs (circuit descriptions) and SDs (schematic diagrams) concerning the HL68, HL223, HL224, and HL69 CPs; 71D or 76D power unit; and BCPA unit:

NUMBER	TITLE
CD-73086-01	Multipoint Junction Units and Auxiliary Circuits
SD-73086-01	
CD-73089-01	5-Volt Power Supply Shelf
SD-73089-01	
CD-73082-01	Bay Clock, Power, and Alarms Unit.
SD-73082-01	

4.04 An MJU consists of one or two junction CPs plugged into a 2-shelf MJU assembly. It can be

tested from a test center using the MSU (multipoint signaling unit), KS-20908 DTS (data test set) digital receiver, and KS-20909 DTS digital transmitter. This test is covered in Practice 314-901-500. An MJU can also be tested at the bay location using the KS-20908

and KS-20909 DTSs as portable test sets. This test is covered in Practice 314-917-500. No tools are required to remove or replace a JCT CP or CLKD CP. For testing information concerning the 71D or 76D power unit, refer to Practice 314-970-101.

♦TABLE A♦						
MJU TEST POINT USE						
CIRCUIT PACK	TEST POINT (NOTE 1)	MJU PORT ACCESSED	TYPE SIGNAL	FROM	TO	USE
HL68 (0-2) HL223 (0-2)	TP1 IN	Port 0	64-kb/s bipolar	Channel	MJU	Monitor channel signal entering MJU or transmit control codes using portable DTS
	TP1 OUT			MJU	Channel	Monitor channel signal leaving MJU
	TP2 IN	Port 1		Branch 1	MJU	Monitor branch signal entering MJU or transmit control codes using portable DTS
	TP2 OUT			MJU	Branch 1	Monitor branch signal leaving MJU
	TP3 IN	Port 2		Branch 2	MJU	Monitor branch signal entering MJU or transmit control codes using portable DTS
	TP3 OUT			MJU	Branch 2	Monitor branch signal leaving MJU
HL68 (3-4) HL224 (3-4)	TP1 IN		64-kb/s bipolar			NOT USED
	TP1 OUT					
	TP2 IN	Port 3		Branch 3	MJU	Monitor branch signal entering MJU or transmit control codes using portable DTS
	TP2 OUT			MJU	Branch 3	Monitor branch signal leaving MJU
	TP3 IN	Port 4		Branch 4	MJU	Monitor branch signal entering MJU or transmit control codes using portable DTS
	TP3 OUT			MJU	Branch 4	Monitor branch signal leaving MJU

See note at end of table.

♦TABLE A♦ (Contd)

MJU TEST POINT USE

CIRCUIT PACK	TEST POINT (NOTE 1)	MJU PORT ACCESSED	TYPE SIGNAL	FROM	TO	USE
HL68 (0-2 and 3-4)	TP6	—	8-kHz clock	Byte clock circuitry	MJU circuitry	Check for presence of byte clock signal
	TP11	—	64-kHz clock	Bit clock circuitry	MJU circuitry	Check for presence of bit clock signal
HL223 (0-2)	TP13	—	—	—	—	Disables TA safeguard circuit, when connected to ground, for testing purposes (HL68 only)
	TP12	Signal ground point				

Note 1: Test points unlisted are not used.

TABLE B
HUB ID CODE STRAPPING ON REAR OF MJU SHELF ASSEMBLY

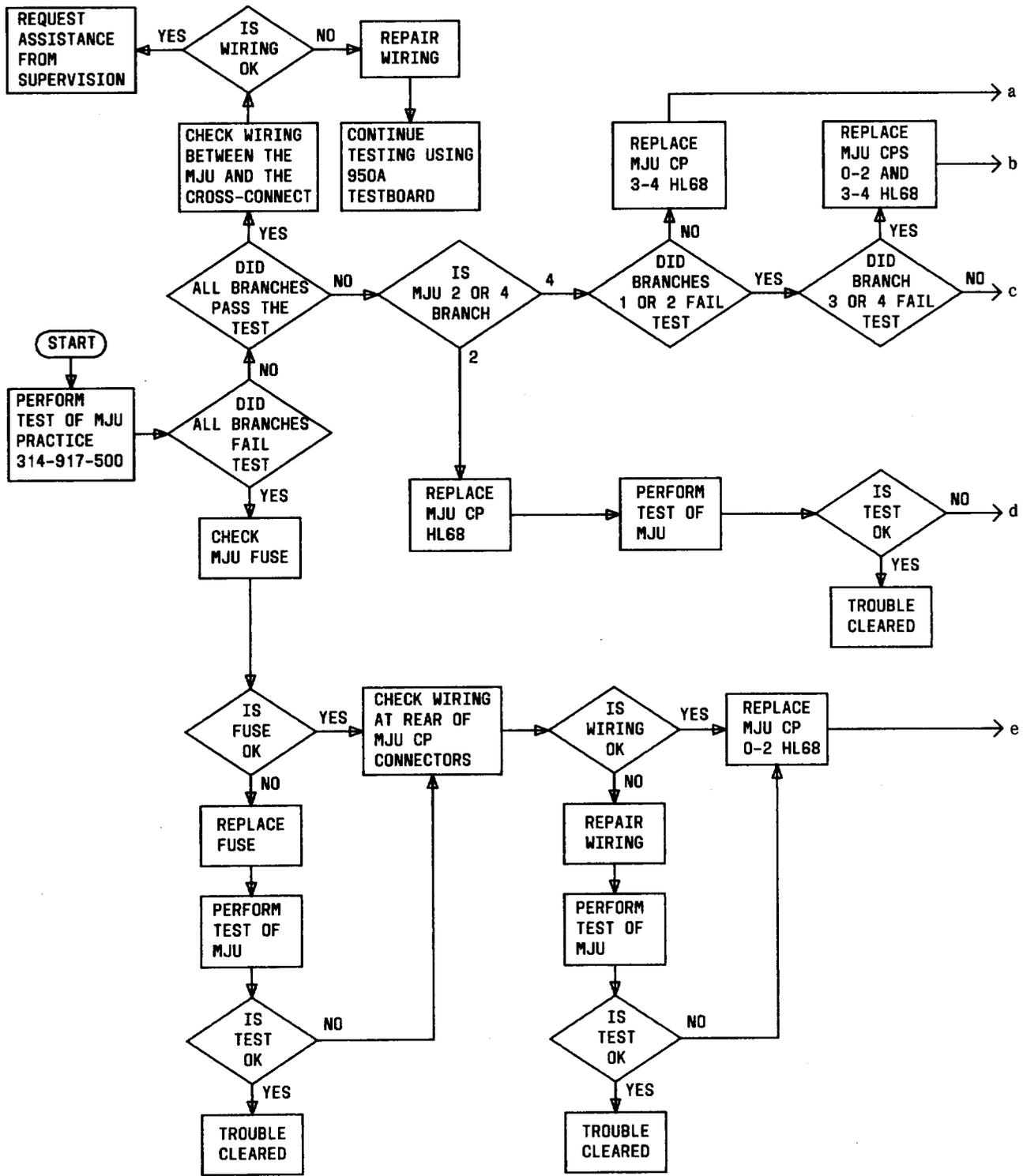
HUB ID CODE	IDC STRAP NUMBER (NOTE 1)					
	2	3	4	5	6	7
01						X
02					X	
03					X	X
04				X		
05				X		X
06				X	X	
07				X	X	X
10			X			
11			X			X
12			X		X	
13			X		X	X
14			X	X		
15			X	X		X
16			X	X	X	
17			X	X	X	X
20		X				
21		X				X
22		X			X	
23		X			X	X
24		X		X		
25		X		X		X
26		X		X	X	
27		X		X	X	X
30		X	X			
31		X	X			X
32		X	X		X	
33		X	X		X	X
34		X	X	X		
35		X	X	X		X
36		X	X	X	X	

HUB ID CODE	IDC STRAP NUMBER (NOTE 1)					
	2	3	4	5	6	7
37		X	X	X	X	X
40	X					
41	X					X
42	X				X	
43	X				X	X
44	X			X		
45	X			X		X
46	X			X	X	
47	X			X	X	X
50	X		X			
51	X		X			X
52	X		X		X	
53	X		X		X	X
54	X		X	X		
55	X		X	X		X
56	X		X	X	X	
57	X		X	X	X	X
60	X	X				
61	X	X				X
62	X	X			X	
63	X	X			X	X
64	X	X		X		
65	X	X		X		X
67	X	X		X	X	X
71	X	X	X			X
72	X	X	X		X	
73	X	X	X		X	X
74	X	X	X	X		
75	X	X	X	X		X
76	X	X	X	X	X	

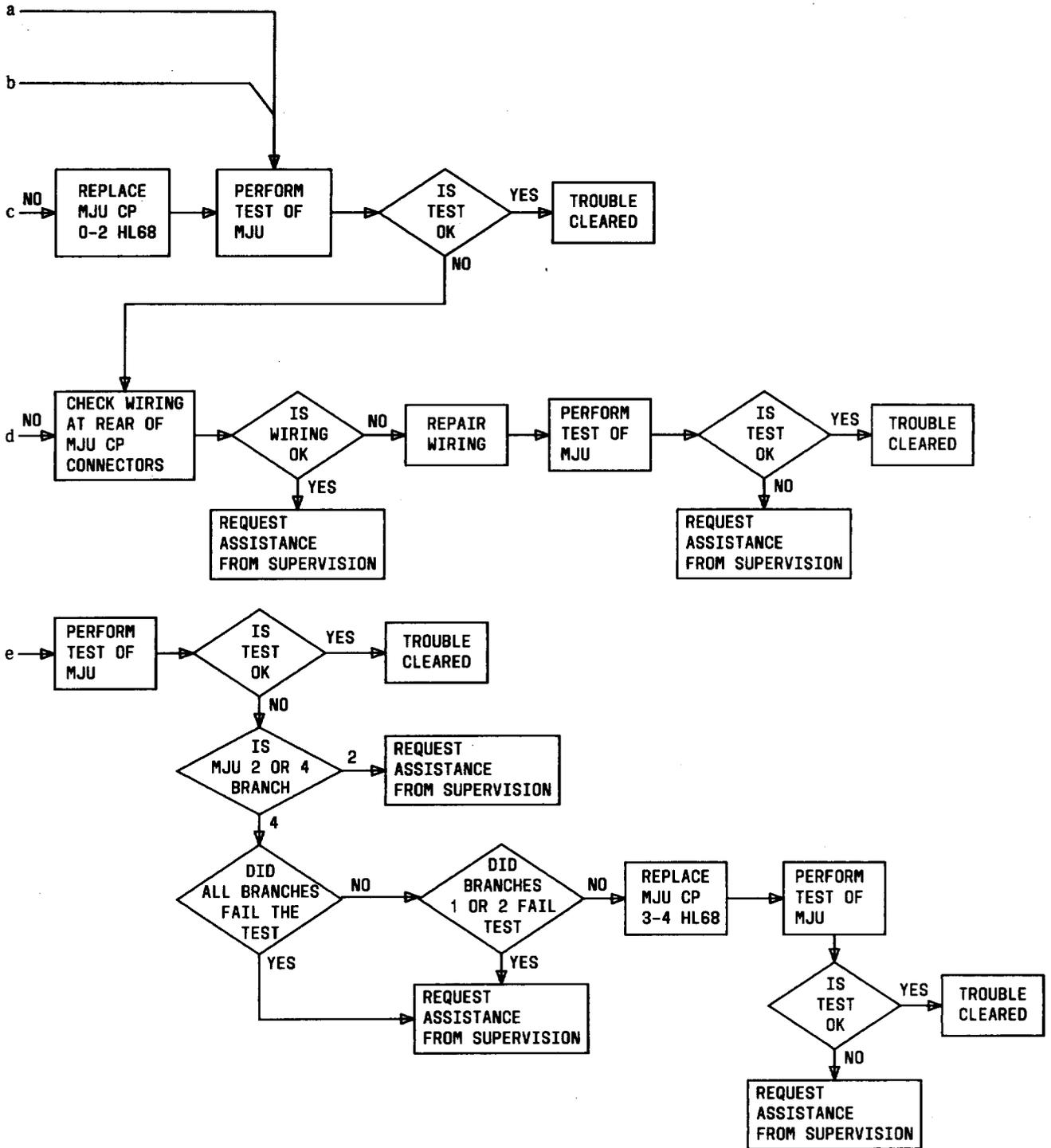
Note 1: X — Denotes strap(s) that must be removed from terminal strip to obtain correct HUB ID code. Each IDC strap is connected between two terminals on the strip as follows:

- IDC strap 2 connects between terminals 2 and 3
- IDC strap 3 connects between terminals 4 and 5
- IDC strap 4 connects between terminals 6 and 7
- IDC strap 5 connects between terminals 8 and 9
- IDC strap 6 connects between terminals 10 and 11
- IDC strap 7 connects between terminals 12 and 13.

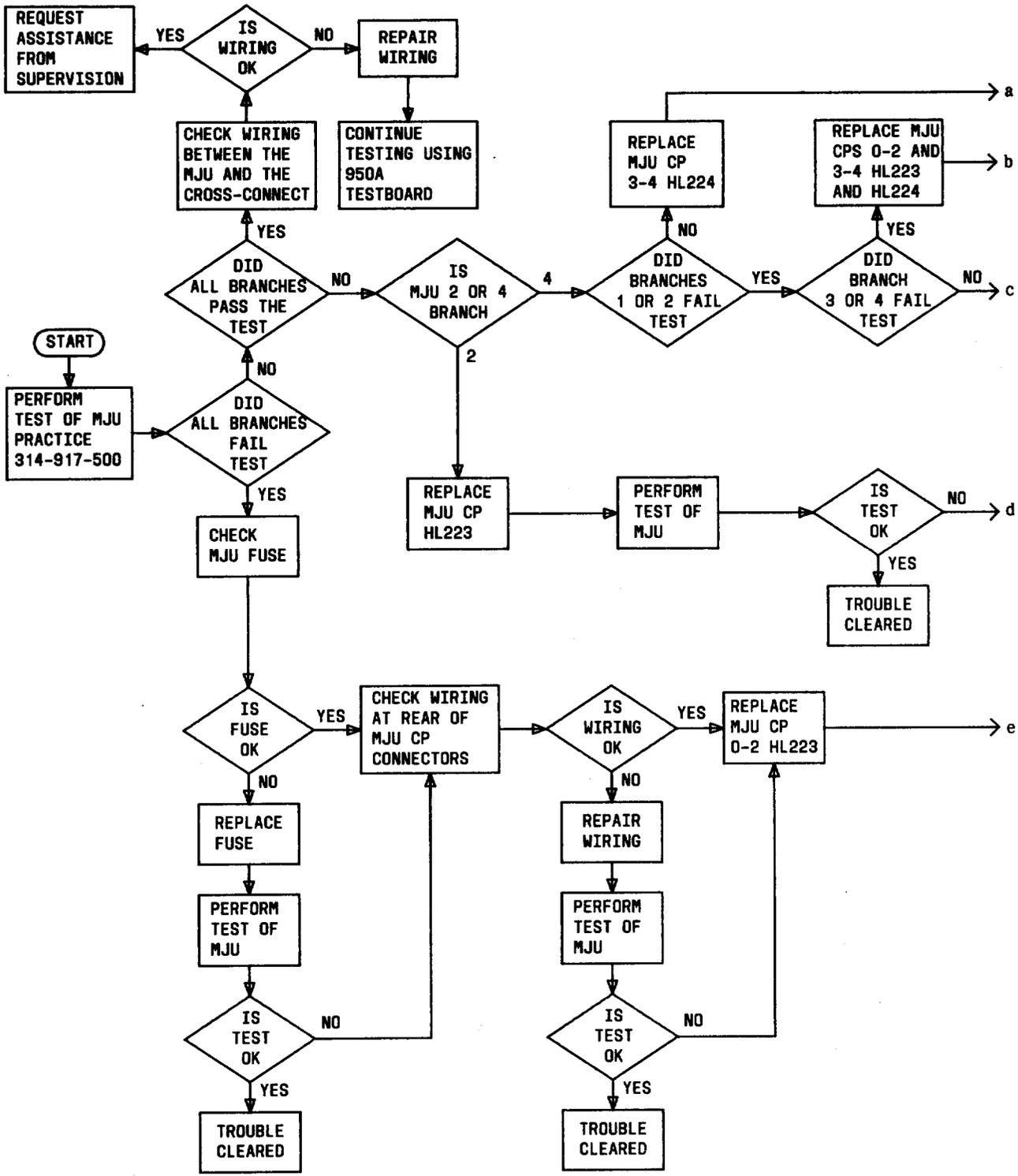
TABLE C					
CLKD (HL69) CP TEST POINT USE					
CIRCUIT PACK	TEST POINT (NOTE 1)	TYPE SIGNAL	FROM	TO	USE
HL69	TP1	8-kHz clock	Byte clock circuitry	CLKD CP and MJU circuitry	Check for presence of byte clock signal
	TP2	64-kHz clock	Bit clock circuitry	CLKD CP and MJU circuitry	Check for presence of bit clock signal
	TP12	Signal ground point			
Note 1: Test points unlisted are not used.					



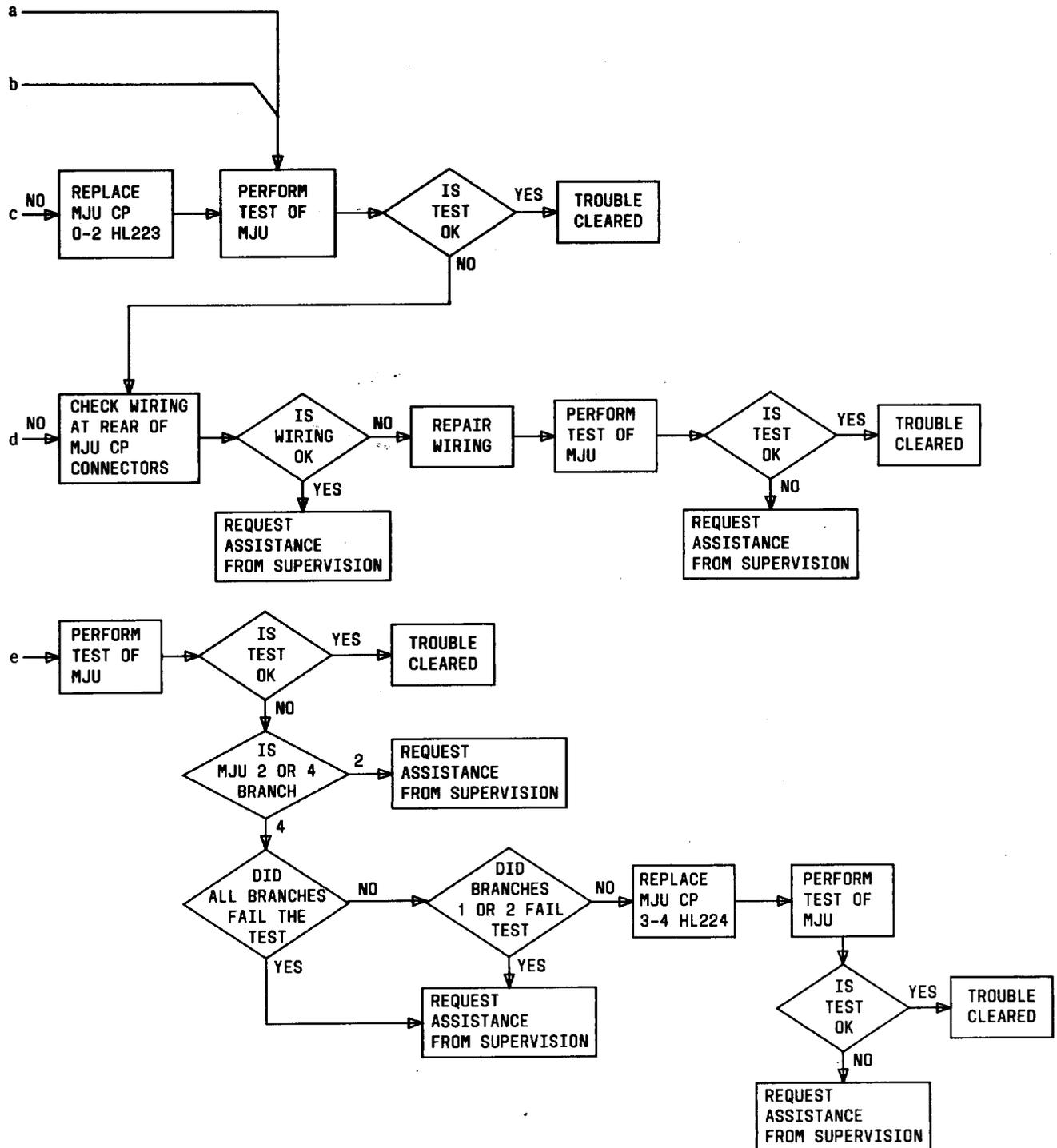
◆Fig. 1—Troubleshooting Flowchart for an MJU (CP HL68) (Sheet 1 of 2)◆



◆Fig. 1—Troubleshooting Flowchart for an MJU (CP HL68) (Sheet 2 of 2)◆



◆Fig. 2—Troubleshooting Flowchart for an MJU (CP HL223/HL224) (Sheet 1 of 2)◆



◆Fig. 2—Troubleshooting Flowchart for an MJU (CP HL223/HL224) (Sheet 2 of 2)◆

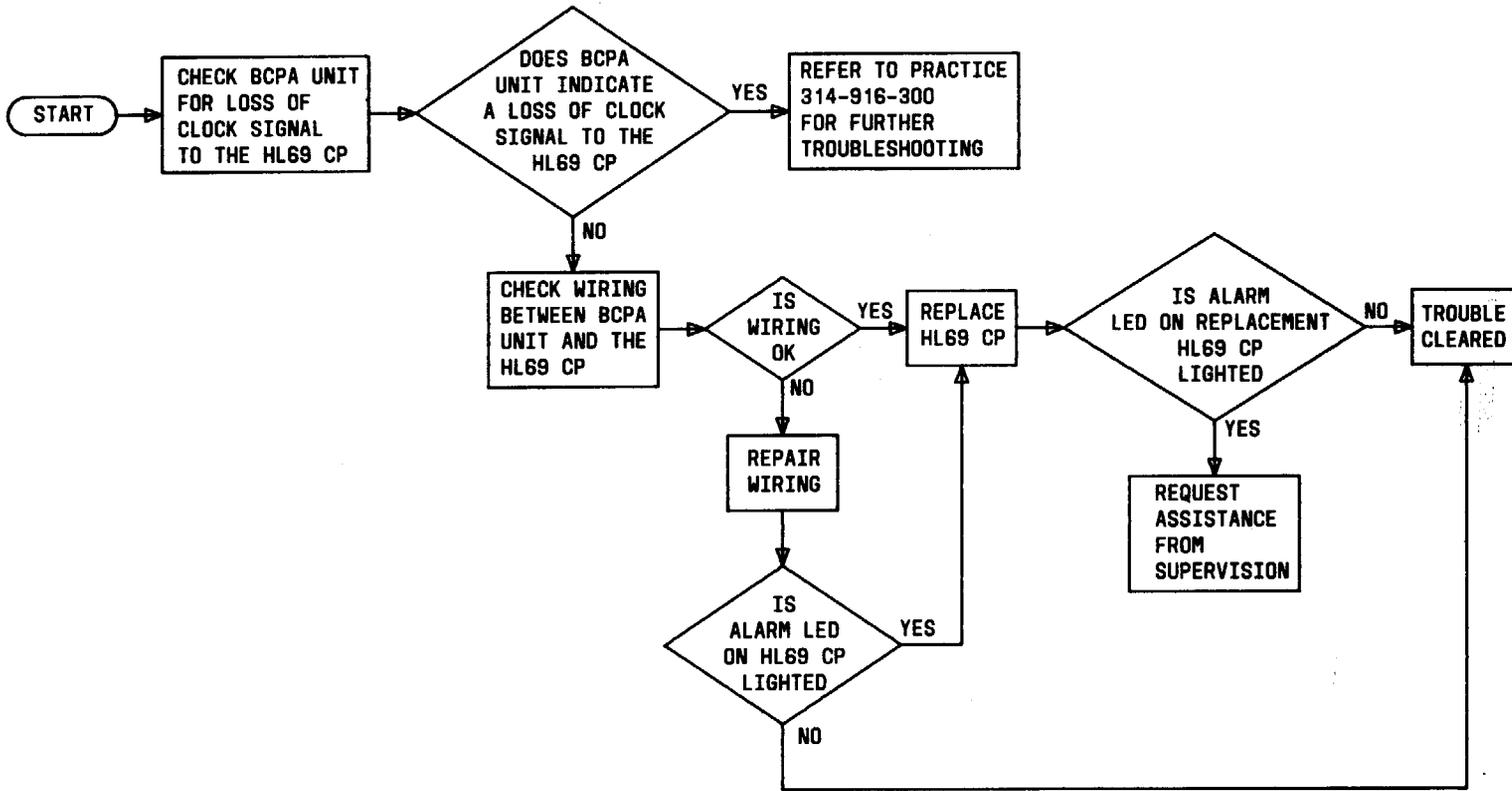


Fig. 3—Troubleshooting Flowchart for a CLKD Circuit Pack