SWITCHED DIGITAL DATA SYSTEM
950B TESTBOARD (J70176C)
MAINTENANCE PROCEDURES

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FIGURES

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1. GENERAL

1.01 This section contains information concerning procedures for removing and replacing the components in a 950B testboard. This section also contains information to assist in locating a defective component in the testboard, and specifies which tool to use when removing and installing the components in a 950B testboard.

1.02 The components in a 950B testboard should be tested according to the section entitled Switched Digital Data System—950B Testboard (J70176C)—Inspection and Maintenance Tests (666-600-501) when suspected of improper operation.

Note: The clock failure lamp should be checked daily for proper operation.

1.03 When a component in the testboard becomes defective, it should be replaced with an identical component known to be operating properly (Table A). The defective component should be returned to a distributing house for repairs.

1.04 The serving test center (STC) should have a certain number of spare components in

TABLE A

REPLACEMENT OF DEFECTIVE COMPONENTS IN A 950B TESTBOARD

DEFECTIVE COMPONENT	CORRECTIVE ACTION
Jack Panel Jack	Replace module containing jack (KS-21156-L1 through -L30).
Cord Reel Unit	Replace defective cord reel unit (ED-73469-30).
KS-20908 DTS	Replace KS-20908 DTS.
KS-20909 DTS	Replace KS-20909 DTS.
Multipoint Signaling Unit	Replace MSU control panel or HL81 or HL82 CP.
TST, SIG, BLK, or CLR Lamp in MSU	Replace 328-type lamp.
Control Code Generator or Test Code Generator	Replace HL66 or HL67 CP.
Clock Line Terminator Circuit Pack	Replace HL49B CP.
Clock Driver Circuit Pack	Replace HL52 CP.
400D KTU	Replace 400D KTU.
416A KTU	Replace 416A KTU.
19C2 Power Unit	Replace power unit.
74A or 78A Power Unit	Replace defective power unit.
Pickup Key	Replace the pickup key assembly (635AY5).
Pickup Key Lamp	Replace 51A lamp.
Telephone Dial Assembly	Replace dial assembly (8J rotary or 35Y3A Touch-Tone®)
Telephone Handset	Replace handset (G5GR-61).
Telephone Handset Cord Reel Unit	Replace cord reel unit (FASTEX 5426).
HOLD Key	Replace HOLD key (651C).

TABLE A (Cont)

REPLACEMENT OF DEFECTIVE COMPONENTS IN A 950B TESTBOARD

DEFECTIVE COMPONENT	CORRECTIVE ACTION
TEL ALM Key	Replace TEL ALM key (651C).
AUD OFF Key	Replace AUD OFF key (651C).
CLOCK Lamp	Replace BEP HW GL 229 RBL-X lamp.

stock. The following is the recommended number of spare components:

Trunk failure display—One of each CP per STC

[CP1 Circuit Pack (CP)—Alarm Driver]

(CP2 Circuit Pack—Vertical Indicator Driver)

Digital signal test unit (DSTU)—One per STC

Jack module—One per testboard

Cord reel unit—One per STC

KS-20908 Data Test Set (DTS receiver)—One per STC

KS-20909 DTS (transmitter)—One per STC

HL66 Circuit Pack—One per STC

HL67 CP—One per STC

HL49B CP—One per STC

HL52 CP—One per STC

HL81 CP—One per STC

HL82 CP—One per STC

MSU control panel—One per STC

400D Key Telephone Unit (KTU)—One per KTU shelf assembly

416A KTU—One per KTU shelf assembly

19A2 Power Unit—One per STC.

Note: The 19A2 power unit is an integral part of the 19C2 power unit and should be replaced when the 19C2 power unit becomes defective.

74A or 78A Power Unit—One per STC

Telephone key assembly—One per STC

Telephone dial assembly—One per STC

Telephone handset—One per STC

Telephone handset cord reel—One per STC.

2. MAINTENANCE AIDS

2.01 This part contains a list of documents and a list of tools and test equipment to aid in installation, trouble location, and removal of testboard components.

2.02 The following is a list of Bell System Practices (BSPs) concerning testboard components:

SECTION	TITLE
107-600-100	Digital Data System—KS-20909 Data Test Set (Transmitter)—Description and Operation
107-601-100	Digital Data System—KS-20908 Data Test Set (Receiver)—Description and Operation
107-602-100	Switched Digital Data System—Digital Signaling Test Unit (DSTU)—Description and Operation

SECTION	TITLE
167-440-201	19- and 20-Type Power Units—Identification, Installation, Connections, and Maintenance
365-330-210	Digital Transmission System— T Carrier Administration System—Turnup Procdures—Remote Office (TFD)
518-215-100	Reference—1A2 Key Telephone System—Identification and Arrangements
518-215-125	Key Telephone Units, 400 Series—Identification
518-215-400	Service—1A2 Key Telephone System—Key Telephone Units, 400 Series
666-600-101	Switched Digital Data System—950B Testboard (J70176C)—Description and Operation
666-600-501	Switched Digital Data System—950B Testboard (J70176C)—Inspection and Maintenance Tests
807-601-180	Performance Requirements for Digital Data System for the 950-Type Testboard—Data Systems.

2.03 The following is a list of circuit descriptions (CDs) and schematic diagrams (SDs) concerning the components in a 950B testboard:

CD- & SD-69513-01 400D Key Telephone Unit

CD- & SD-69559-01 416A Key Telephone Unit

CD- & SD-73076-01 KS-20908 Data Test Set

CD- & SD-73077-01 KS-20909 Data Test Set

CD- & SD-73085-01 950-Type Testboard

CD- & SD-99609-01 Local Maintenance Center Display Circuit [Trunk Failure Display (TFD)].

2.04 Table B lists the tools and test equipment necessary to test, remove, and install the components in a 950B testboard.

3. MAINTENANCE PROCEDURES

3.01 This part contains procedures for removing defective components from and installing replacement components in a 950B testboard.

3.02 Removal and installation of components in a 950B testboard and KTU shelf assembly are given below.

(a) Trunk failure display (TFD) assembly—To remove and install a TFD circuit pack, perform the following steps.

(1) Remove vertical designation strip on side of testboard adjacent to TFD by depressing top and bottom, then lifting up and out.

(2) Remove TFD cover plate, using a screwdriver. Lift latch and remove defective CP(s). Replace defective CP(s) then reverse disassembly procedure.

(b) Jack Module—To remove and install a jack module, perform the following steps.

Caution: Before removing a jack module, follow local procedures in obtaining customer release of defective jack module.

(1) Remove the designation strips from the front (top and bottom) of the module by pulling straight out on the top edge of each strip.

(2) Use a Philips Head screwdriver and remove the screws from the front (top and bottom) of the module.

Caution: While performing the next step, do not touch the terminals on the rear of adjacent jack modules.

(3) From the rear of the testboard, pull straight out on the module as far as wiring will permit.

(4) Label and remove the wires from the terminals with the wire unwrapping tool.

TABLE B

TEST EQUIPMENT AND TOOLS NECESSARY TO TEST, REMOVE, AND INSTALL TESTBOARD COMPONENTS

COMPONENT	TEST EQUIPMENT	TOOLS FOR REMOVAL AND INSTALLATION
Jack Module	None	Philips Head Screwdriver KS-16492-L2 Wire Unwrapping Tool Soldering Iron (if required) KS-16363-L1 Wire Wrapping Tool
Cord Reel Unit	None	Screwdriver
KS-20908 DTS	KS-20909 DTS or Control and Test Code Generator	None
KS-20909 DTS	KS-20908 DTS	None
MSU Control Panel	None	Screwdriver
HL81 or HL82 CP	KS-20908 and KS-20909 DTSs	None
HL66 or HL67 CP	KS-20908 DTS	None
HL49B or HL52 CP	None	None
400D or 416A KTU	None	None
Telephone Handset Cord Reel Unit	None	Screwdriver Nutdriver
19C2 Power Unit	KS-16979-L1 VOM	Screwdriver
74A or 78A Power Unit	KS-16979-L1 VOM	None
Key Mounting Assembly	None	Screwdriver
Telephone Dial Assembly	None	Screwdriver
Telephone Handset	None	Screwdriver
Trunk Failure Display	W1AP Cord or Equivalent	Screwdriver
Digital Signal Test Unit	None	Screwdriver

(5) Connect the wires to the rear of the replacement module in one of two ways:

(a) If the wires are long enough, cut and dress the wires and wrap them around the terminals with a wire-wrapping tool.

(b) If the wires are short, piece out with similar wire, soldering the splice, then wrap as in (a) above.

Caution: Use extreme care not to damage adjacent wiring with soldering iron.

(6) Insert the module into the slot where the defective module was removed.

(7) Replace the screws on the front of the module.

(8) Replace the designation strips on the front of the module.

Notify customers that data transmission can be resumed.

(c) Cord Reel Unit—Remove and install a cord reel unit as follows:

(1) Remove the designation strips from the front of the cord reel unit.

(2) Use a screwdriver to remove the two screws from the front of the defective cord reel unit.

(3) Remove the cable connector from the rear of the cord reel unit. Push unit partially out from the rear, then pull straight out on the front of cord reel unit.

(4) To install a new cord reel unit, reverse the above procedure.

Note: If the cord reel unit containing the transmitter and receiver plugs becomes defective, exchange connectors (on the rear of the cord reels) with a cord reel unit which is operating properly until a replacement cord reel unit can be installed. The designations should also be exchanged if the change is made.

(d) Digital Signaling Test Unit (DSTU)—To remove and replace the DSTU, perform the following steps.

(1) Remove both vertical designation strips by depressing top and bottom then lifting up and out.

(2) Disconnect three DSTU cables.

(3) Remove screws from each side of DSTU panel.

(4) Pull DSTU forward to remove.

(5) To install, reverse the above procedure.

(e) Telephone Handset—Remove and replace the handset as follows:

(1) Remove the transmitter cap, receiver cap, and push-to-talk button from the handset.

(2) Disconnect the wires from the rear of the transmitter, receiver, and push-to-talk button.

(3) Grasp the telephone cord and pull the wires out of the handset.

(4) From the replacement handset, remove the transmitter cap, receiver cap, and push-to-talk button, and disconnect the retractile cord.

(5) Insert the cord wires into the handset through the hole in the transmitter end of the handset.

(6) Connect the wires to the rear of the transmitter, receiver, and push-to-talk button.

(7) Replace the transmitter, receiver, and push-to-talk button in the handset.

(8) Replace the transmitter and receiver caps.

(f) Telephone Handset Cord Reel Unit—Remove and install a telephone handset cord reel unit as follows:

(1) Remove the cord from the handset according to (e) above.

(2) Remove the flat cord reel unit cable from the terminal strip. Remove the nuts and washers from the two studs holding the cord reel unit.

(3) Remove the cord reel unit from the testboard.

(4) To install a telephone handset cord reel unit, reverse the above procedure.

(g) Multipoint Signaling Unit (MSU) Control Panel—Remove and install the MSU control panel as follows:

(1) Remove the magnetically secured plate surrounding the keys, display, and switch by pulling straight out on the top and bottom of the plate.

(2) On the top of the equipment shelf, disconnect P28 from J28.

(3) On the rear of the control panel:

(a) Disconnect J8 from P8 and remove P8 from the testboard.

(b) Disconnect the plugs from J9 and J10 and remove the J9 and J10 jack assemblies from the testboard.

(4) Remove the screws located at each corner of the MSU control panel and pull straight out on the panel.

(5) To install an MSU, reverse the above procedure.

(6) Remove and install the TST, SIG, BLK, or CLR lamp as follows:

(a) Remove the keytop by pulling straight out on the keytop.

(b) Remove the defective lamp.

(c) Insert the replacement lamp (No. 328) into the holder.

(d) Replace the keytop.

(h) KS-20908 DTS or KS-20909 DTS—Remove and install the DTS as follows:

(1) Remove the DTS power, clock, and signal cord plugs from their connectors.

(2) Loosen the test set support bracket at the rear of the test set and slide the bracket to the lowest position.

(3) Raise the rear of the DTS until it clears the support bracket and pull the DTS out from the rear of the testboard.

(4) Install the DTS by laying the DTS on the shelf in front of the support bracket so that the rear of the DTS rests against the front of the support bracket.

(5) Slide the DTS and support bracket toward the front of the testboard into the proper position.

(6) Tighten the knob on the bottom of the support bracket to prevent the bracket from slipping.

(7) Insert the power, clock, and signal cord plugs into their respective outlet or connector.

(i) 74A and 78A Power Units and HL49B, HL52, HL66, HL67, HL81, and HL82 CPs—Remove and install the CPs as follows:

(1) Remove bottom cover from the testboard. Depress the ejector latch at the base of the CP faceplate.

(2) Pull straight out on the CP faceplate until the CP is clear of the nest.

(3) To install a CP, insert the CP into the correct slots in the nest and push on the CP faceplate until the ejector latch engages the equipment shelf.

(j) 400D and 416A KTUs—Remove and install a KTU as follows:

(1) Use a screwdriver to loosen the screw holding the KTU designation tab and rotate the tab so that the KTU can be removed.

(2) Grasp the CP faceplate at the top and bottom slots and pull straight out.

(3) To install a KTU, insert the KTU into the correct slot in the nest and push on the faceplate until the rear of the CP is inserted into the connector.

(4) Rotate the KTU designation tab to lock the KTU and tighten the screw holding the tab.

(k) 19A2 Power Unit—Remove and install the power unit as follows:

Note 1: The 19C2 power unit is a 19A2 power unit with hardware for mounting in a key service unit or relay rack. When the 19C2 power unit becomes defective, replace the 19A2 power unit only instead of replacing the entire 19C2 power unit.

Note 2: Before removing wires from the power unit, tag the wires so that they can be connected to the correct terminals on the replacement unit.

(1) Remove the power cord from the 117-Vac outlet and the connections from the front and rear of the power unit.

(2) Remove the six screws holding the power unit in the housing.

(3) Pull the power unit out from the front of the KTU shelf.

(4) To install the power unit, insert the power unit into the housing.

(5) Replace and tighten the screws holding the power unit in the housing.

(6) Insert the power cord connector into the connector on the rear of the power unit and terminate the wires on the front and rear of the unit.

(7) Insert the power cord plug into the 117-Vac outlet.

(l) Key Mounting Assembly—Remove and install the key mounting assembly as follows:

Note: The procedure given below pertains to the pickup key assembly and the HOLD, TEL ALM, and AUD OFF key assembly.

(1) Remove the magnetically secured plate surrounding the keys by pulling straight out on the top and bottom of the plate.

(2) Remove the screws holding the key assembly.

(3) Pull straight out on the key assembly until the connectors on the rear of the keys are exposed.

(4) Pull the plugs off of the rear of the keys and tag each plug.

(5) To install a key assembly, insert the plugs into the rear of the keys.

(6) Insert the key assembly into the testboard.

(7) Insert and tighten the screws that hold the assembly in place.

(8) Replace the plate around the keys.

(9) Remove and install the lamps under the keytops as follows:

(a) Remove the keytop by pulling straight out on the keytop.

(b) Remove the defective lamp.

(c) Replace the defective lamp with a 51A-type lamp.

(d) Replace the keytop.

(m) Telephone Dial Assembly—Remove and install the telephone dial assembly as follows:

(1) Remove the magnetically secured plate surrounding the dial by pulling straight out on the top and bottom of the plate.

(2) Tag and remove the wires from TS (E) located under the writing shelf.

(3) Remove the screws holding the dial assembly in place.

(4) Pull the dial assembly forward until the wires can be removed from the dial assembly.

(5) Tag and remove the wires from the dial assembly.

(6) To replace the dial assembly, connect the wires to the rear of the assembly.

(7) Insert the dial assembly into the testboard.

(8) Insert and tighten the screws that hold the assembly in place.

(9) Connect the wires to TS(E) located under the writing shelf.

(10) Replace the plate around the dial.

(n) CLOCK Lamp—Remove and replace the lamp as follows:

(1) Remove the lens cap by pulling straight out on the cap.

(2) Remove the defective lamp.

(3) Replace the defective lamp with a Shelley Associates, Inc. BEP HW GL 229 RBL-X lamp.

(4) Replace the lens cap.

4. MAINTENANCE ACTIVITIES

4.01 This part contains flowcharts to aid in locating defective components in the testboards.

4.02 The following flowcharts (Fig. 1 through 12) will aid in locating defective components in the testboard. The tests referred to in the flowcharts can be found in Section 666-600-501.

Note: If a lamp indication is required during any of the tests and the lamp does not illuminate, check the lamp according to Fig. 7.

4.03 When a defective component is removed from the testboard, it should be replaced with an identical component known to be in proper operating condition.

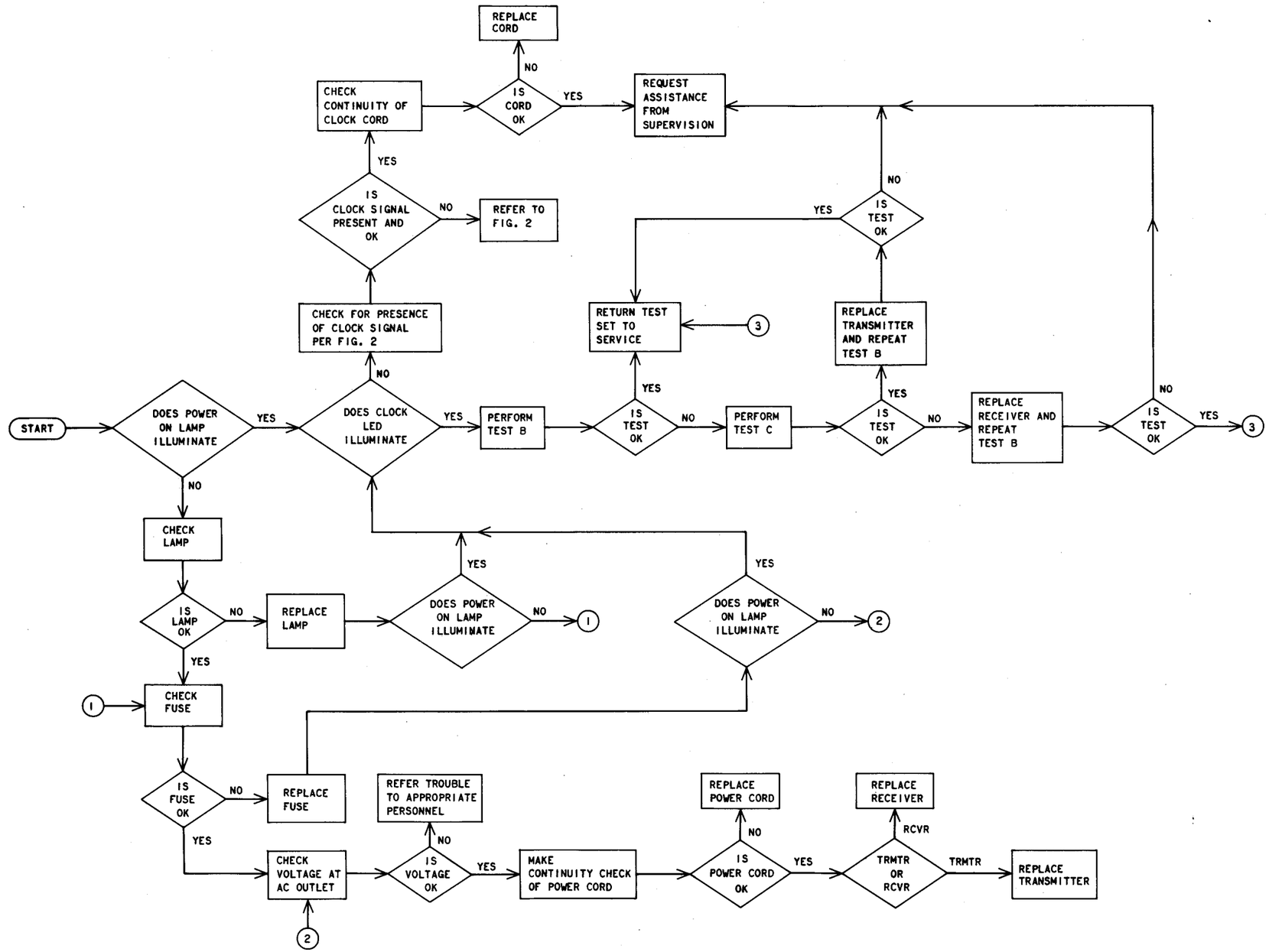

Fig. 1—Troubleshooting Flowchart for KS-20908 and KS-20909 Data Test Sets

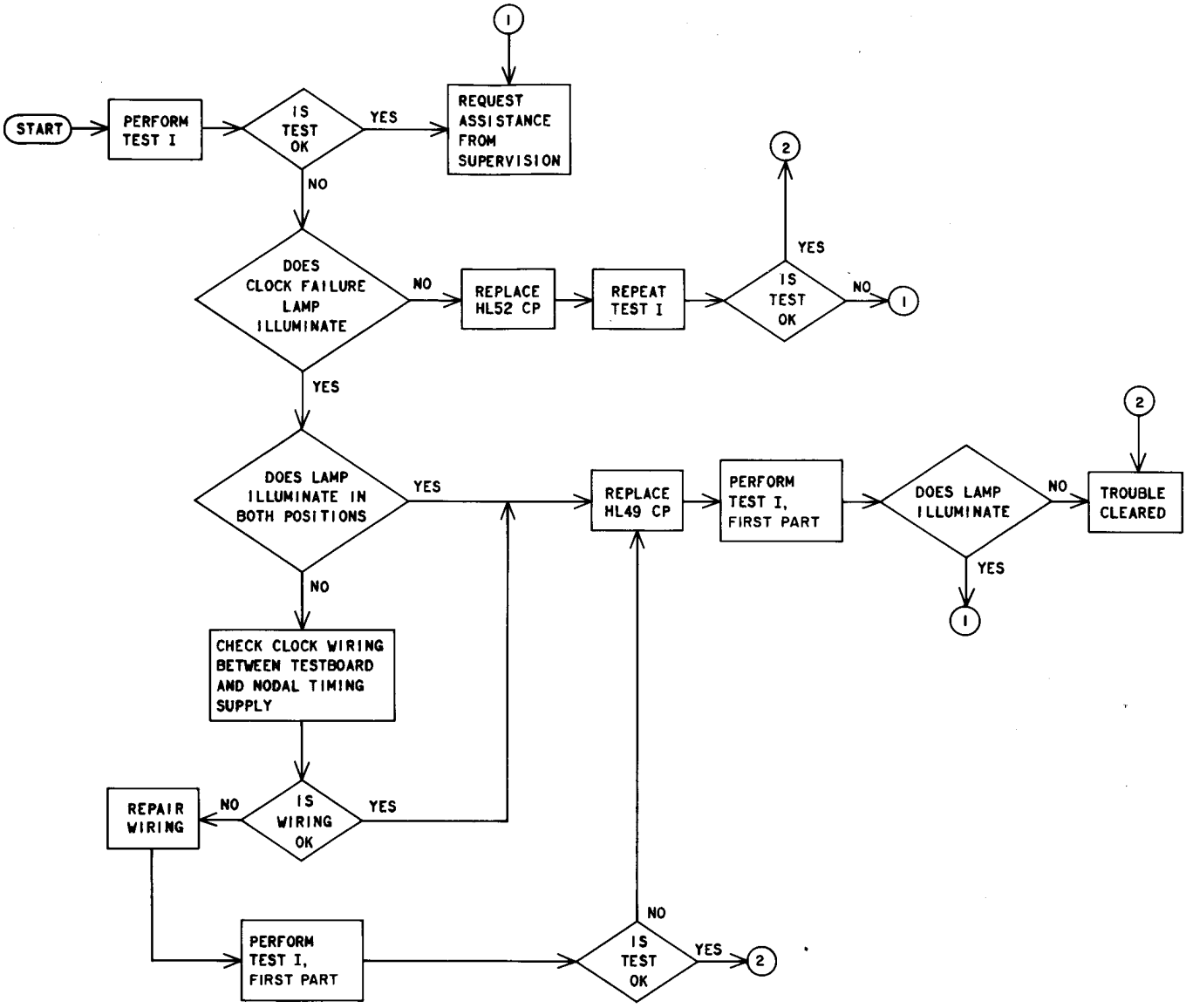

Fig. 2—Troubleshooting Flowchart for Clock Circuitry

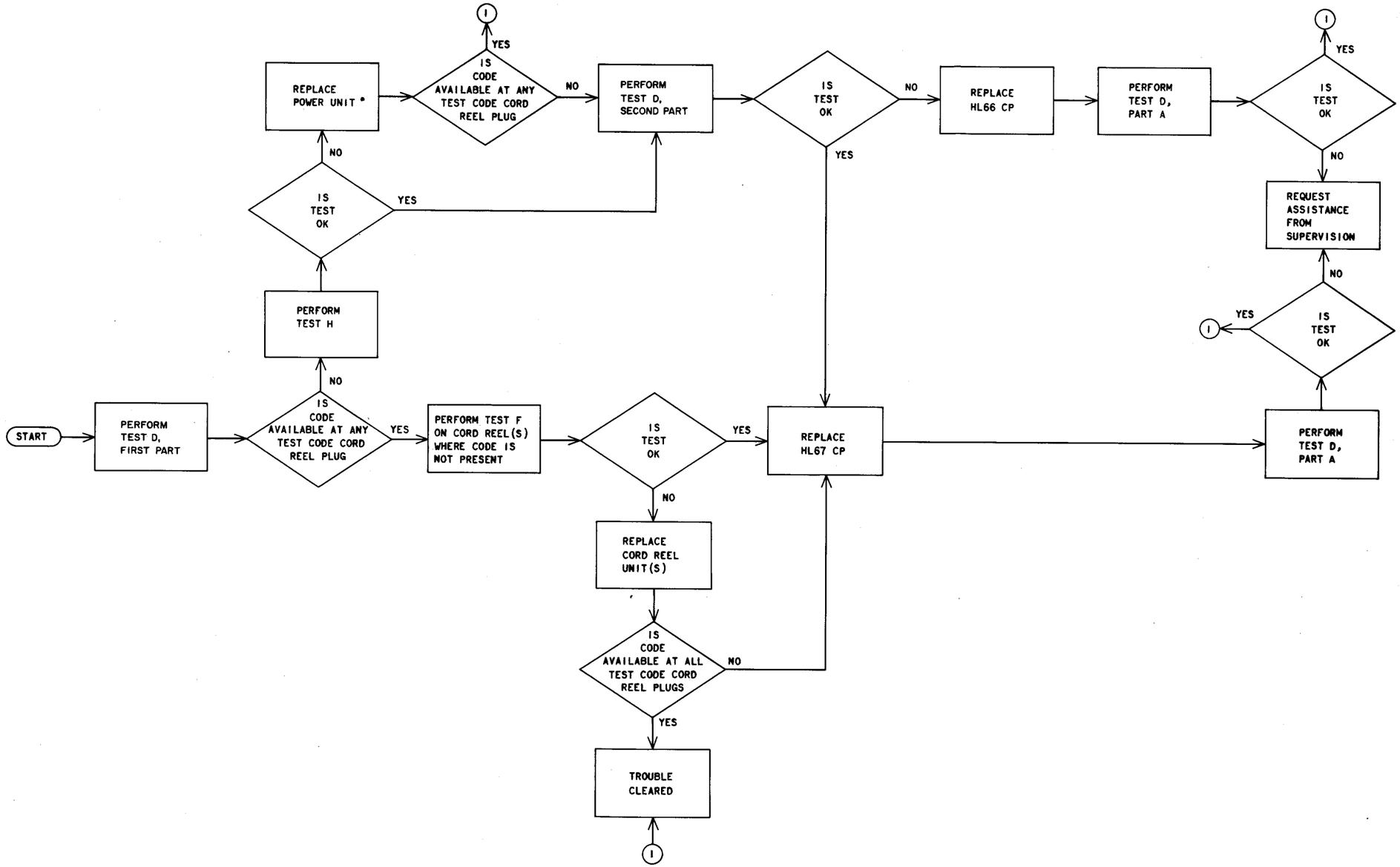

Fig. 3—Troubleshooting Flowchart for Test Code Generator

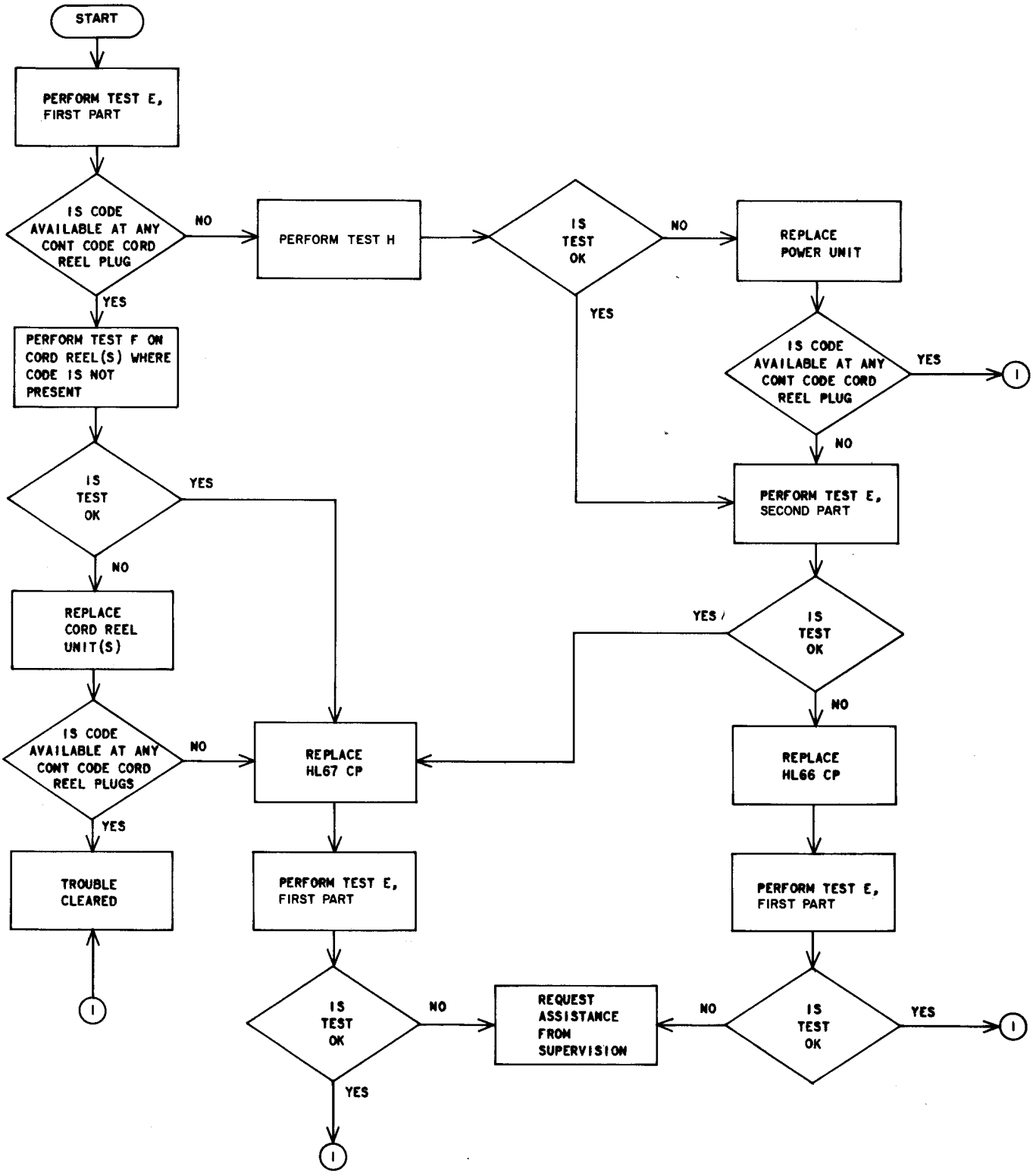

Fig. 4—Troubleshooting Flowchart for Control Code Generator

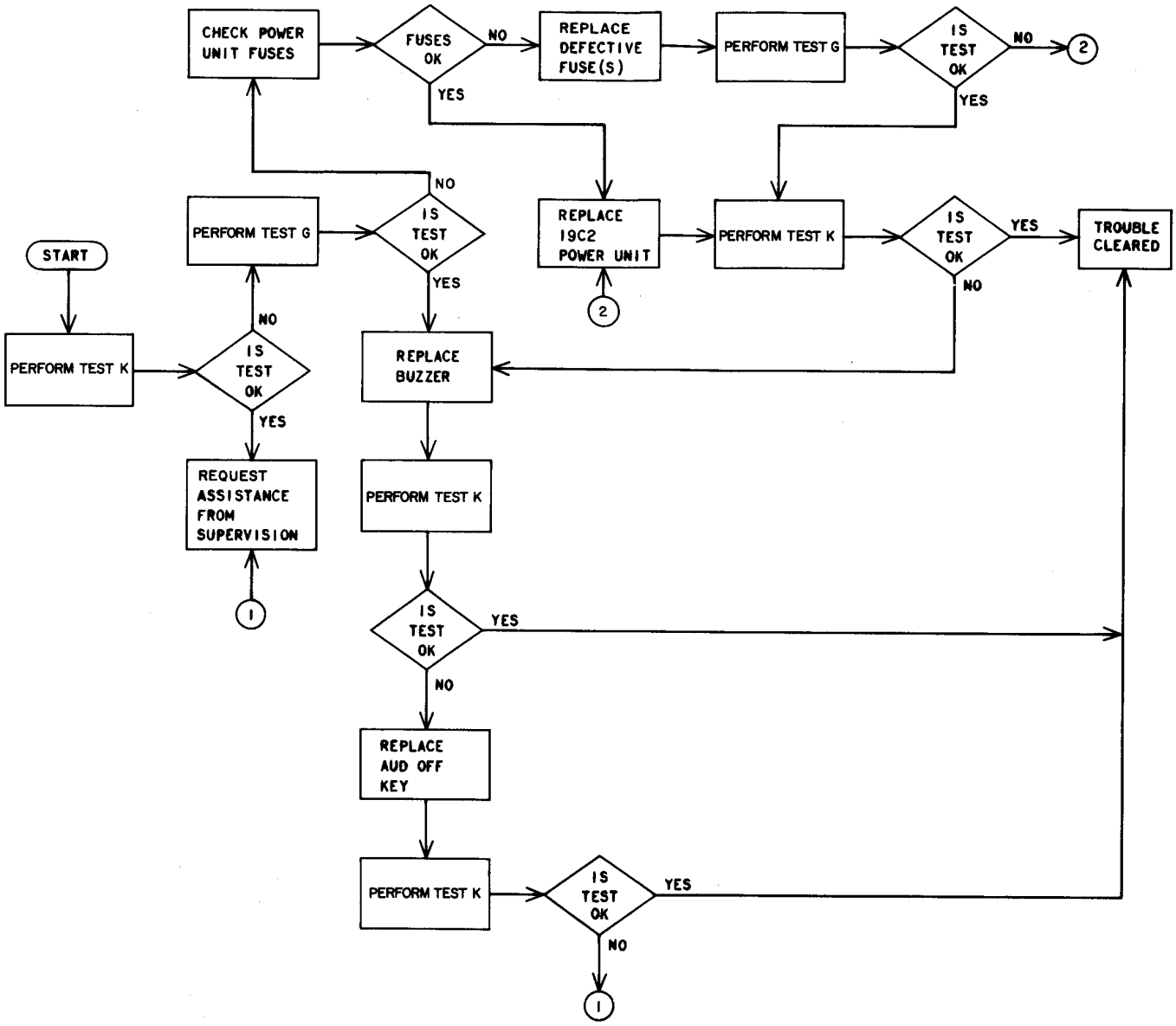

Fig. 5—Troubleshooting Flowchart for Telephone Buzzer Circuitry

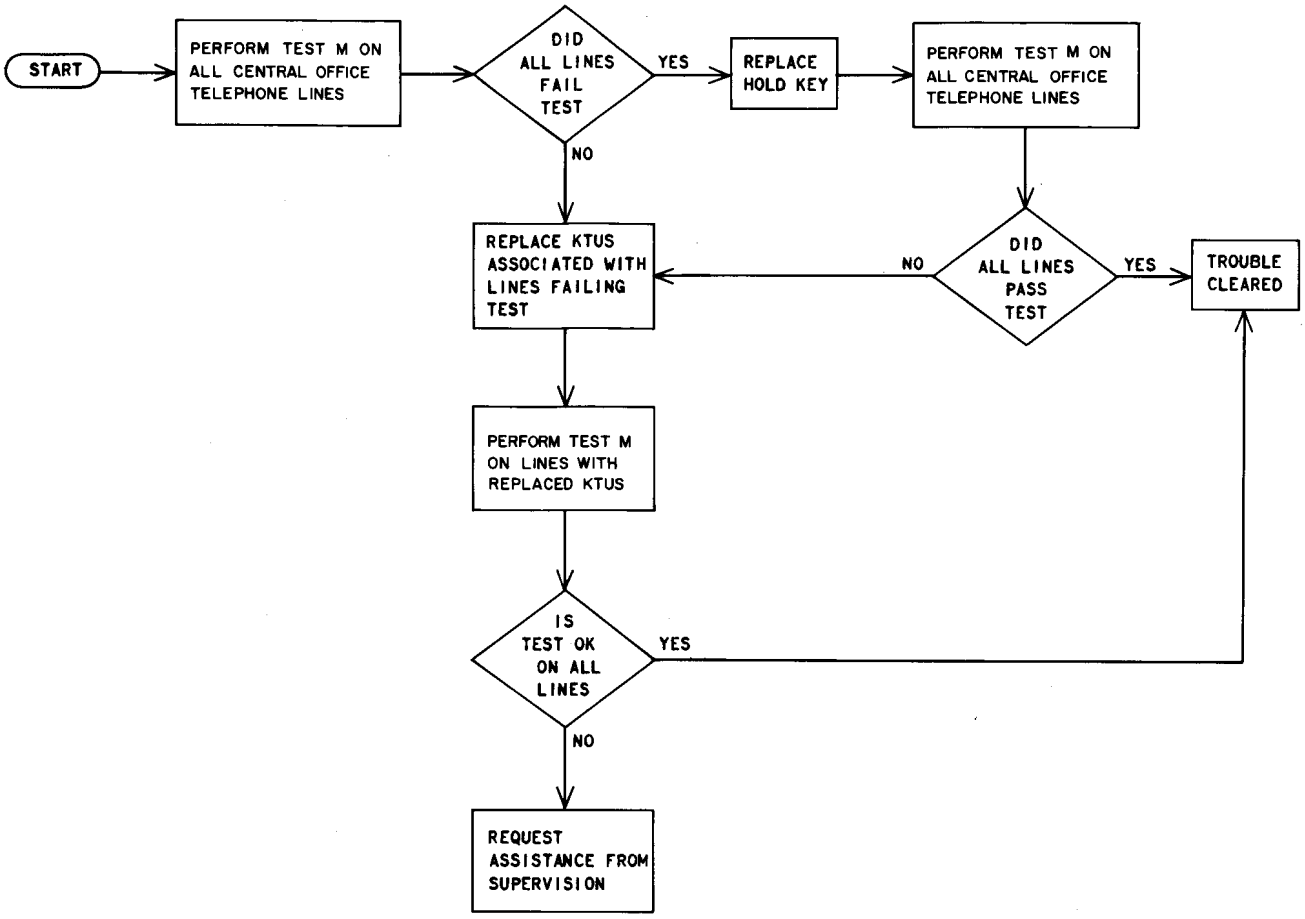

Fig. 6—Troubleshooting Flowchart for Telephone Hold Feature

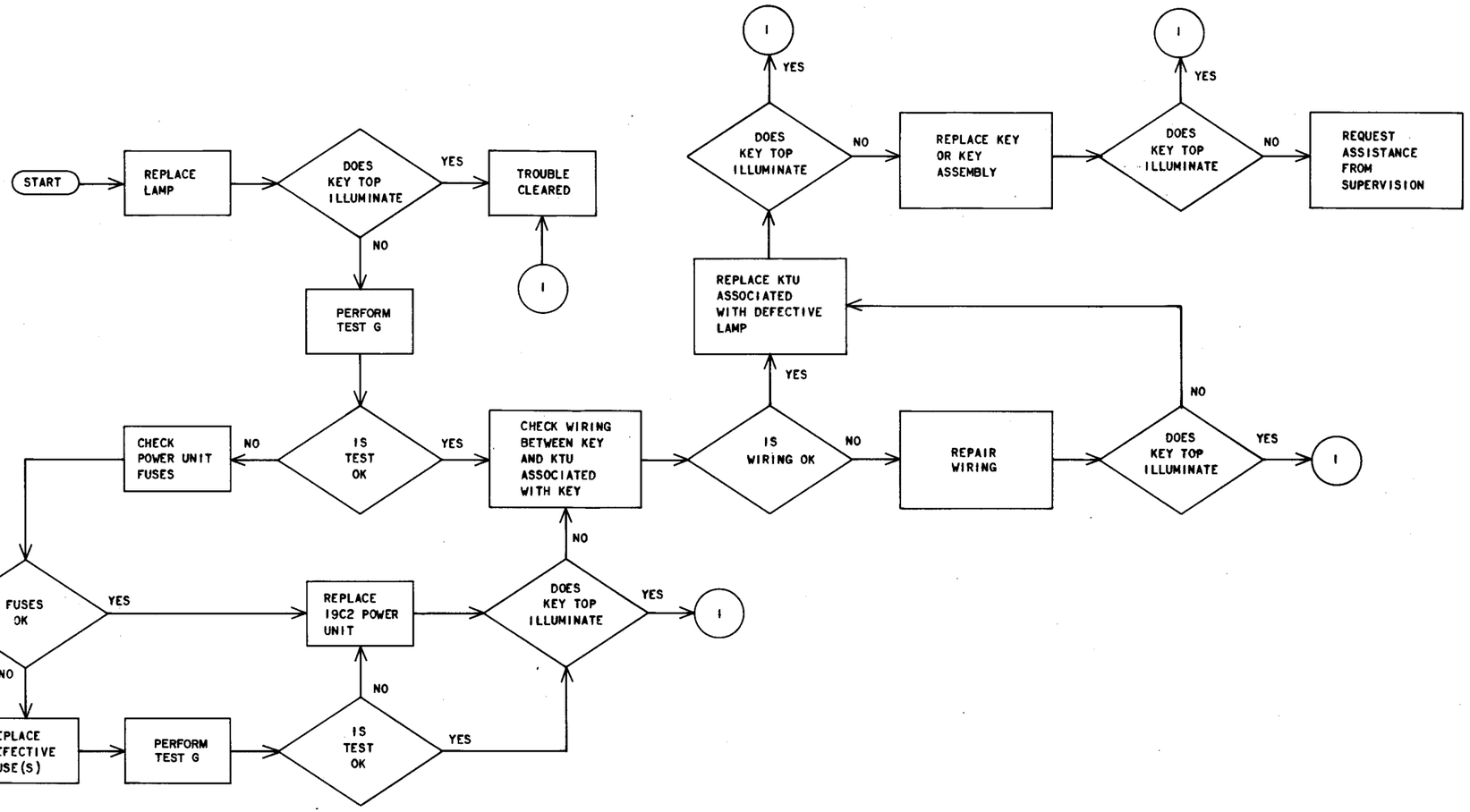

Fig. 7—Troubleshooting Flowchart for Lamps Under Keytops Associated With Telephone

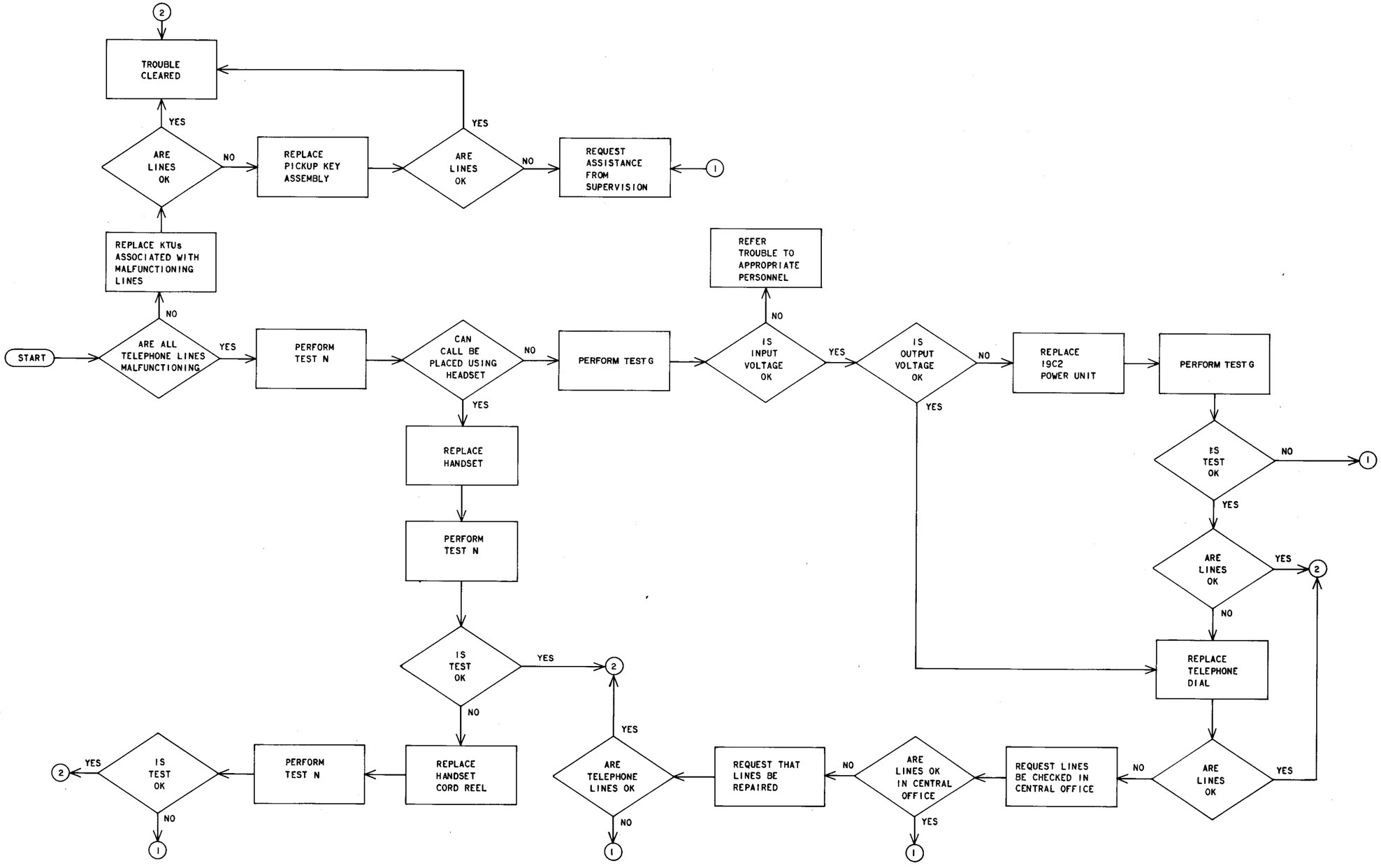

Fig. 8—Troubleshooting Flowchart for Telephone Components

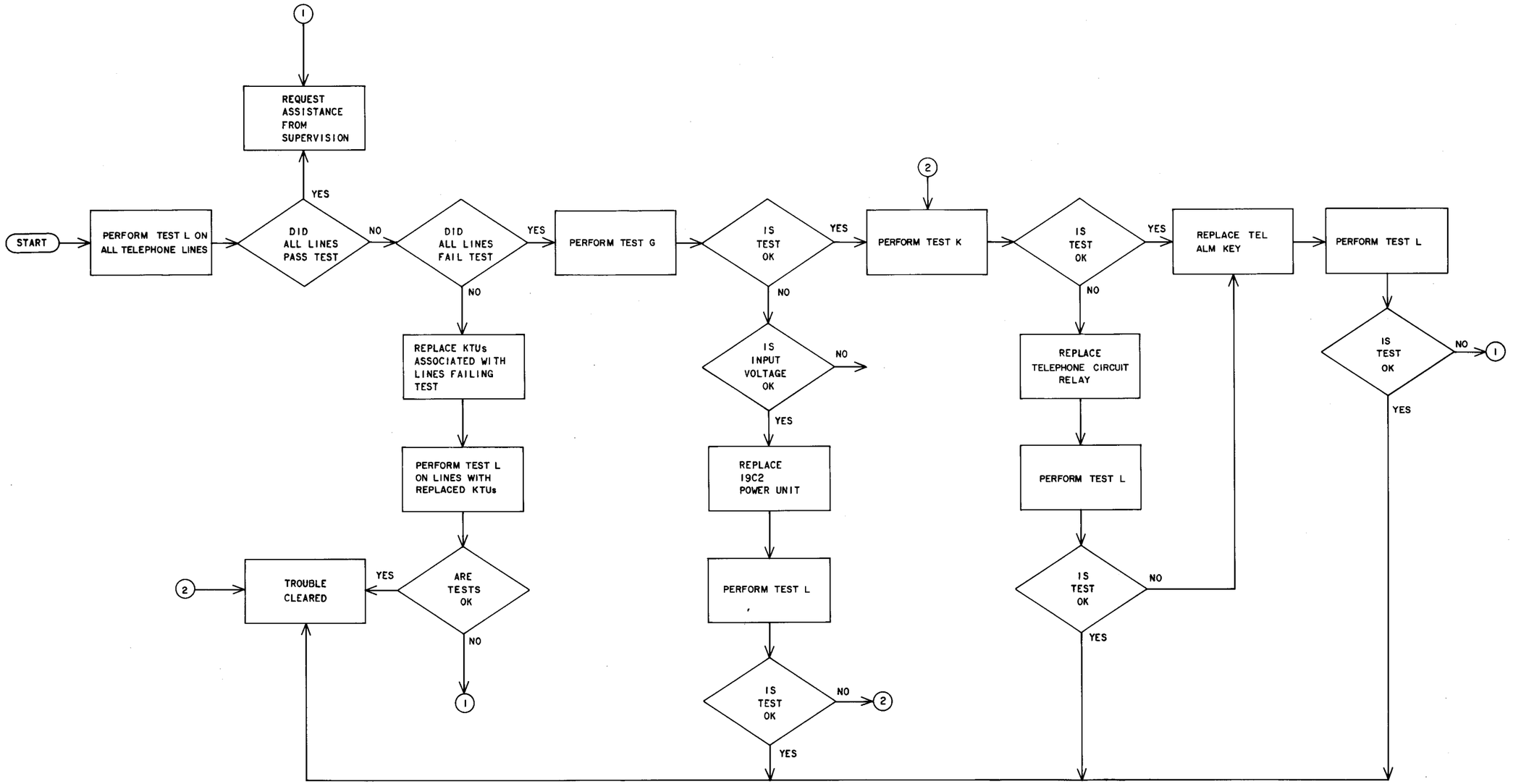

Fig. 9—Troubleshooting Flowchart for Central Office Service Alarm

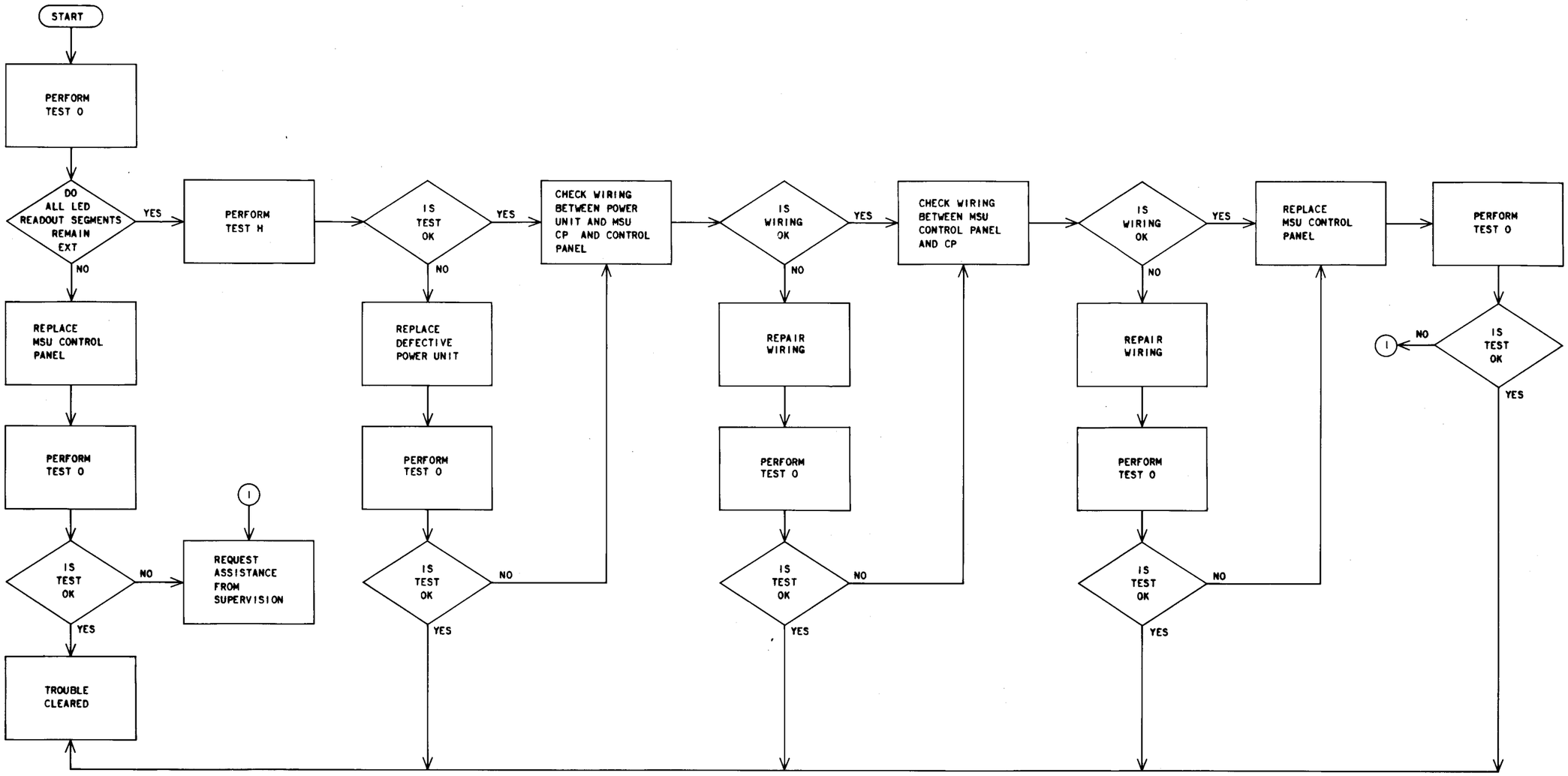

Fig. 10—Troubleshooting Flowchart for the MSU Display Readouts

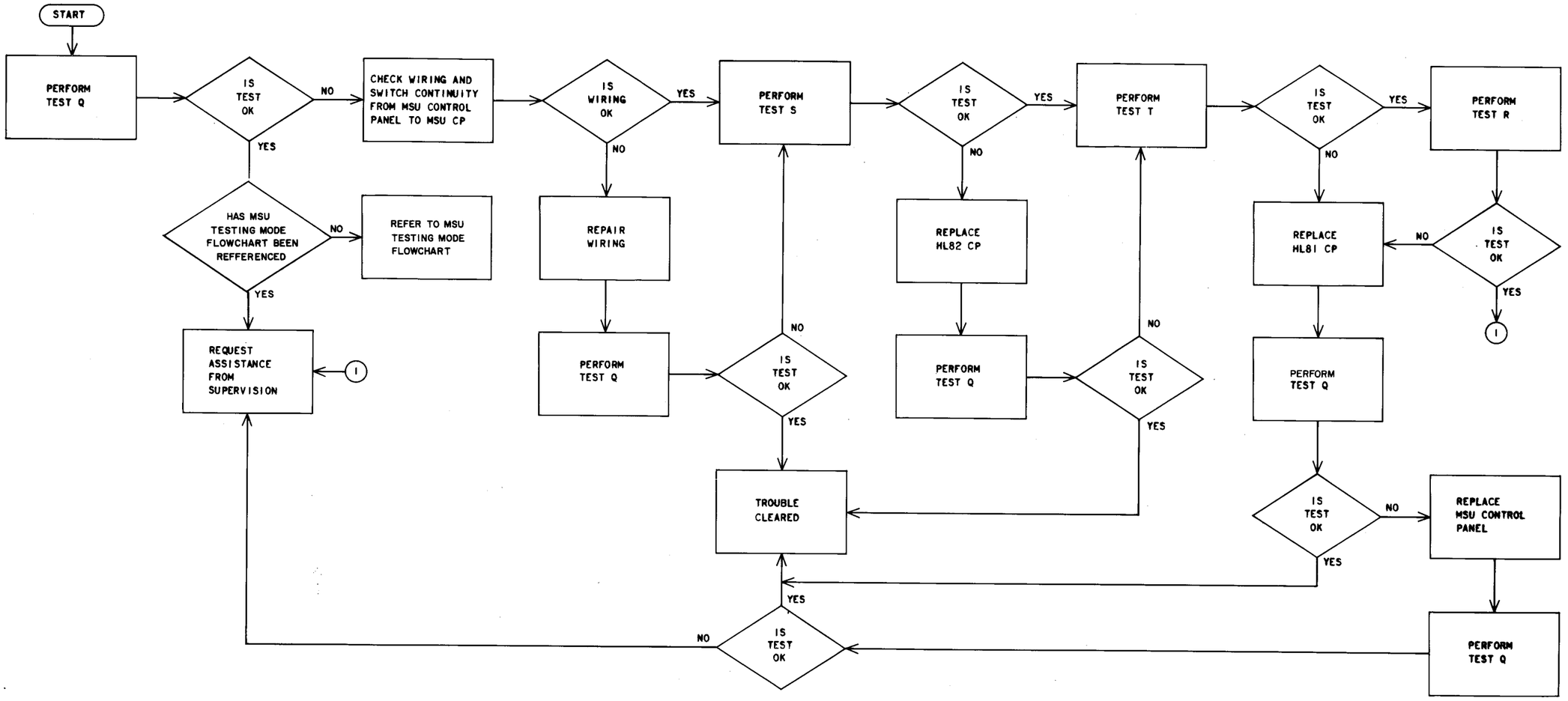

Fig. 11—Troubleshooting Flowchart for MSU Signaling and Clearing Modes

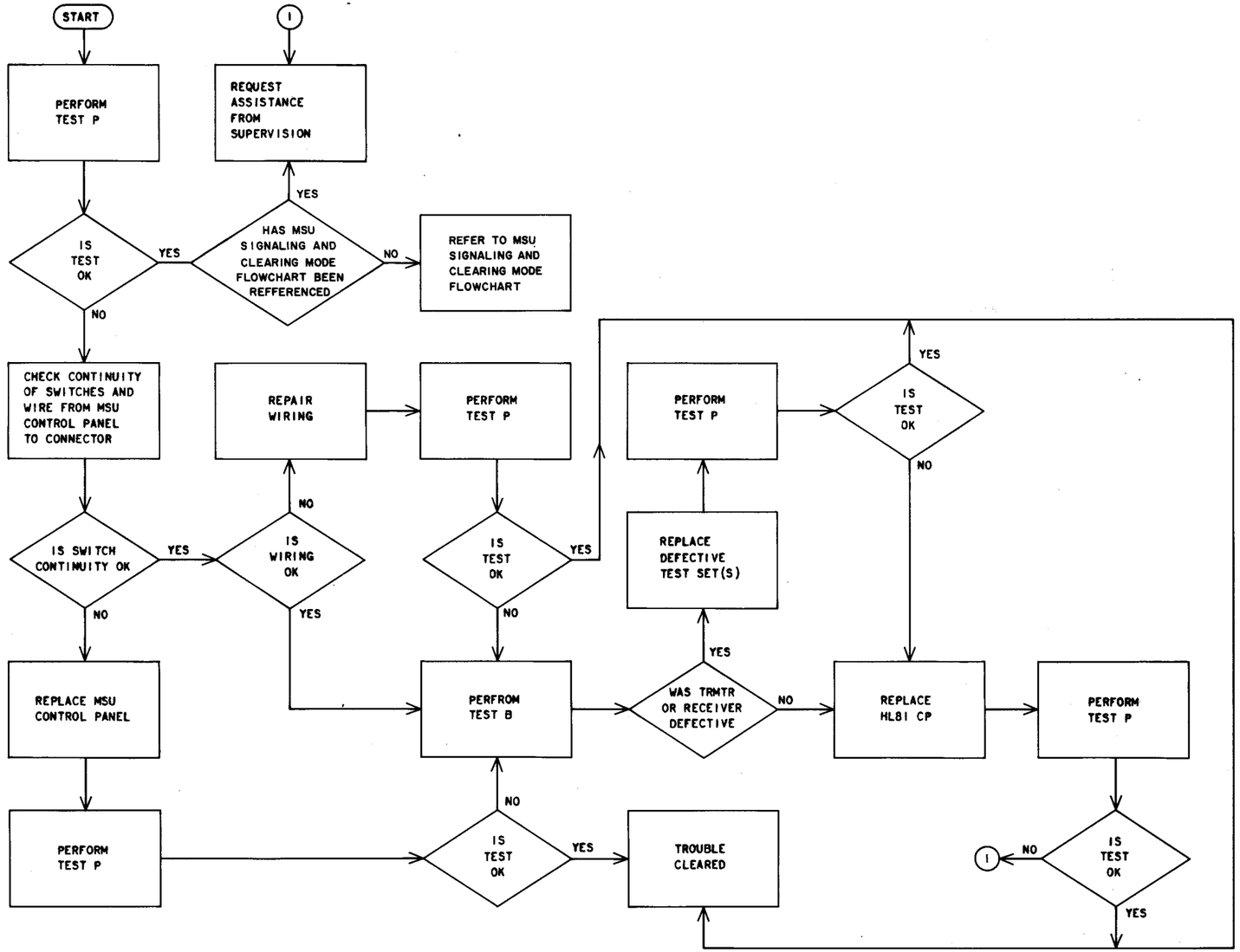

Fig. 12—Troubleshooting Flowchart for MSU Testing Mode