CHAPTER 5
TROUBLESHOOTING

5.1 An Introduction to Troubleshooting

Troubleshooting is usually to easy; vaned symptoms appear depending on points of failure. This section describes two procedures which may allow easier troubleshooting and subsequent repair:

1. Check-out procedure

   Objective: To guide the user through a problem isolation process when symptoms do not indicate a specific component malfunction.

   Fault isolation level: Repair by unit replacement, repair can be accomplished with a basic knowledge of computer hardware.

2. Unit repair flowchart

   Objective: To guide the user through a component level repair process.

   Allow a component-level repair of an individual faulty unit.

   Fault isolation level: Component level – Requires an advanced knowledge of computer hardware engineering, and electronics.

General troubleshooting procedure

- First, isolate and replace the faulty unit according to the check-out procedure faulty each time a unit is replaced, to make sure the new unit is not faulty. This process will prevent confusion with a problem caused by poor connector contacts.
- Second, isolate and replace the faulty component in the unit according to the appropriate unit flowchart or the trouble table.

Step 1		Step 2
Check-out procedure	→	Unit repair flowchart
Repair by unit replacement		Repair at component level

Note 1) All checks indicated on the flowchart must be made.
Should any unit or component be replaced disregarding any check, the newly installed one might be damaged.

Note 2) Whenever you are lost in the repair procedure, return to the entry and restart the procedure.

Note 3) When no exit is found, during a diagnostic procedure (e.g., the test process has resulted in repeating a diagnostic loop), proceed with the repair according to the trouble table.

5.2 Test Program

A test program is supplied stored in an E-PROM with carrier which can be installed in the computer ROM capsule. The test program provides tests for the ten functions listed in Table 5.1. It allows either one of the following two execution modes

- AUTO Modo

  In this mode, the program automatically performs a six test cycle. If desired, the cycle may be repeated up to 99 times. The number of cycles may be selected after loading the program. This mode is suitable for an aging test after repair or a test on a problem of very low reproducibility.

- MANUAL Mode

The manual mode allows the user to select any one test from those listed in Table 5-1 and is an aid to component level troubleshooting.

Table 5-1 Functions Tested by the Test Program

No.	Tested Functions
1	RAM CHECK
2	BUZZER CHECK
3	RS, SER CHECK
4	LCD CHECK
5	MCMT CHECK
6	DIP-SW READ CHECK
7	KEY BOARD CHECK
8	ANALOG INPUT CHECK
9	BARCODE CHECK
10	CLOCK CHECK

5.2.1 Repairing Tools

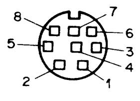
Table 5-2 lists necessary repair tools which are available from EPSON.

Table 5-2 Repaired Repair Tools

	Tool	Q'ty
1	Test program ROM	1
2	RS-232C interface mini-wrapping connector	1
3	Serial interface mini-wrapping connector	1
4	Microcassette tape	1
5	Cable assembly (P/N B778400201)	1
6	DC regulator or dry-cell battery	1
7	Low-resolution barcode reader	1

The wrapping connector, internal pin connections, and the external power supply set-up, etc. are illustrated in Fig. 5-1.

Wrapping connector pin arrangement



Internal pin connections

Serial interface	RS-232C interface
4 ↔ 5	6 ↔ 7
2 ↔ 3	2 ↔ 3
	4 ↔ 5 ↔ 8

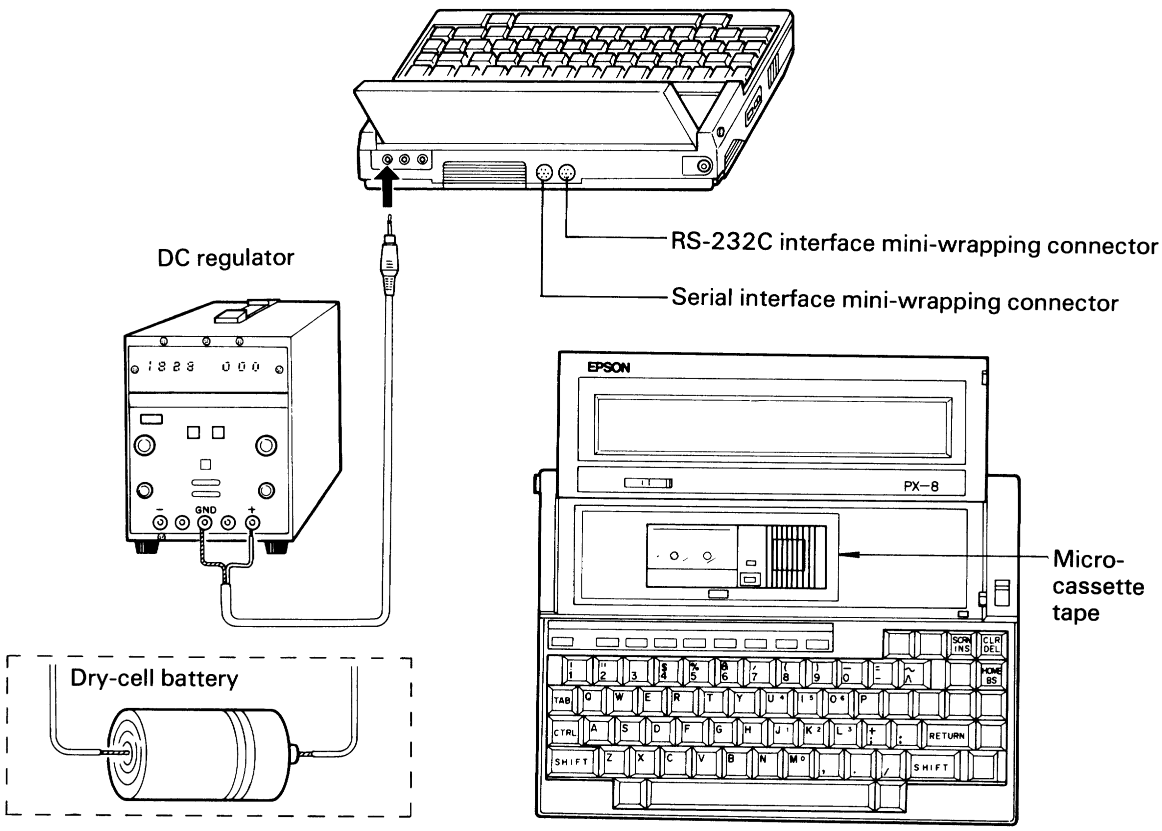


Fig. 5-1 Set-up for Repair

5.2.2 Installing the Test Program ROM

To install the test program ROM in the ROM capsule of the computer, perform the following steps:

Step (1): Reset the POWER switch OFF.

Step (2): Remove the ROM capsule cover from the bottom panel.

Step (3): When two ROMs are already installed in the capsule, remove either one by alternately lifting up on the tabs at both ends of the ROM.

* If the ROM is difficult to remove, alternately raise both the ends with a flat screw driver.

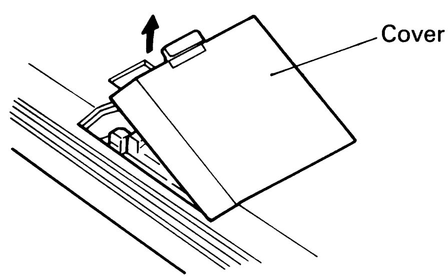


Fig. 5-2 ROM Capsule Cover Removal

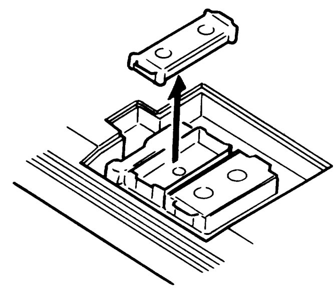


Fig. 5-3 ROM Removal

Step 4: Insert the test program ROM in the capsule. Make sure that the ROM pins are properly inserted into the socket.

Note: When neither ROM capsule is empty, the test program ROM may be inserted in either ROM socket; ROMB or ROMC. When one ROM is already installed, insert the test program ROM in the empty socket.

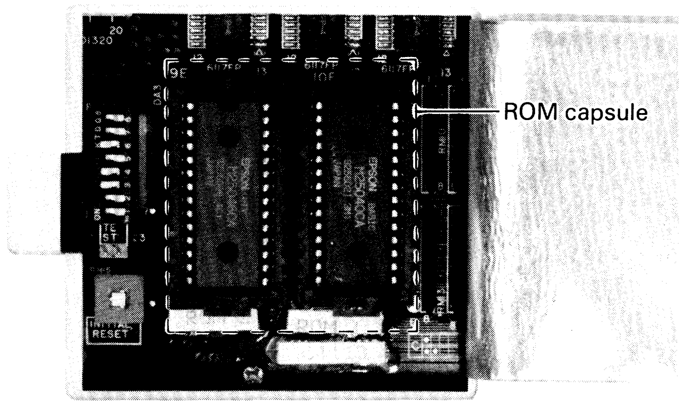


Fig. 5-4 ROM Capsule Sockets

Step 5: Replacethe ROM capsule cover.

5.2.3 Loading the Test Program

Set the POWER switch ON and check to see that the menu shown in Fig. 5-5 appears on the LCD panel. The display varies depending on the inserted ROM. If nothing appears on the panel, press the RESET switch.

```
*** MENU screen ***
B:MAPTST
C:PIP      COM    C:STAT   COM    C:SUBMIT   COM    C:XSUB     COM
C:FILINK   COM    C:TERM   COM    C:CONFIG   COM    D:MAPTST   COM
```

Fig. 5-5 Tet Program Menu

- Move the cursor so that "MAPTST" blinks, and then press the RETURN key.

Note: One of the messages shown in Fig. 5-6 will be displayed, depending on the ROM capsule socket in which the program ROM is inserted.

```
A>B:MAPTST
```

1. Message displayed when test program ROM is inserted in ROM 1 socket.

```
A>C:MAPTST
```

2. Message displayed when test program ROM is inserted in ROM 2 socket.

Fig. 5-6 Test Program ROM Location Information Messages

- After the above preparation, the following menu will appear on the LCD panel.

```
TEST PROGRAM MENU MODE Ver 1.Ø

     1 : AUTO
     2 : MANUAL
```

Fig. 5-7 AUTO and MANUAL Mode Selection Menu

5.2.4 Selecting a Test Mode

In response to the menu in Fig. 5-7, key in "1" or "2", respectively, to select the AUTO or MANUAL test mode.

- <u>AUTO Mode</u>

  When the AUTO mode is selected ("1" is keyed in), the prompt of Fig. 5-8 should appear. Specify a number of test cycles to be run by responding with a number from 1 to 99.
  RAM, buzzer, RS-232C interface, serial interface, LCD unit, microcassette tape drive, and DIP switch tests make up one test cycle. When the AUTO mode is selected, this cycle is repeated according to the number of times specified in response to the prompt.

```
CHECK COUNT ?
```

Fig. 5-8 Prompt for Number of Test Cycles

- <u>MANUAL Mode</u>

```
TEST PROGRAM SELECT
 1.RAM CHECK                2.BUZZER CHECK
 3.RS,SER CHECK             4.LCD CHECK
 5.MCMT CHECK               6.DIP-SW READ CHECK
 7.KEY BOARD CHECK          8.ANALOG INPUT CHECK
 9.BARCODE CHECK           1Ø.CLOCK CHECK
```

Fig. 5-9 Menu for an Individual Test

Select a test by keying in the number preceding the test. When the test is completed, the display stops. To repeat the test again, press the spacebar, otherwise, press the RETURN key.
To stop the test after the keyboard check has been selected, key in "Break".
* If any error message appears, refer to section 5.2.6.

5.2.5 Test Run Procedure and Display Information

This section describes the procedure for running the individual tests and display information given by them.

```
MEMORY & V-RAM CHECK
```

Fig. 5-10 RAM Check Test Information Message

(1) RAM Check

- The information message displayed in Fig. 5-11 appears.
- The RAM and V-RAM check tests are performed in succession and the following messages are displayed when the tests are completed.

```
RAM CHECK END !!
VRAM CHECKING !!
VRAM CHECK END NOW !!
```

Fig. 5-11 RAM Check Test End Messages

(2) Buzzer Check

- The buzzer sounds for approximately three seconds.
- The buzzer further sounds at two different tones and then the following prompt is displayed:

```
BUZZER OK ?
```

Fig. 5-12 Buzzer Check Test Prompt

* Adjust the sound level and do another check.

(3) RS-232C and Serial Interface Check

Step 1: Insert the RS-232C serial interface connector, which is connected according to the instructions in section 5-1. (The RS-232C socket is labeled on the PX-8 case.)

Step 2: Key in "3" for the test menu (TEST PROGRAM SELECT). The RS-232C and Serial Interface Check test will be selected. The program runs the RS-232C interface test first, displaying the following information:

```
RS232C CHECKING
RS232C CHECK END NAW
```

Fig. 5-13 RS-232 Interface Check Phase Information Messages

Step 3: The program then runs the serial interface test the display should appear as in Fig. 5-14.

```
HIGH SPEED SERIALING
HIGH SPEED SERIAL END NOW !!
```

Fig. 5-14 Serial Interface Check Phase Information Messages

Step 4: These messages indicate the end of the test.

(4) LCD Check

- The entire LCD panel display is reversed.
- The LCD panel display is reversed every other dot and then the black and white conbination is reversed.
- The LCD panel display is reversed every four dots and then the black and white conbination is reversed.

  The following character pattern appears (Fig. 5-15) and the test ends.

```
      ******  CHRAGENE TEST  ******

 !"#$%&'()*+,-./0123456789:;<=>?@ABCDEFGHIJKLMNOPQRSTUVWXYZ[¥]^_`abcdefghijklmno
pqrstuvwxyz{|}~
```

Fig. 5-15 LCD Check Test Character Pattern

(5) MCMT (Microcassette Tape Drive) Check

- The following prompt appears:

```
SPEAKER ON ? (Y/N)
```

Fig. 5-16 First MCMT Check Test Prompt

If speaker sound output is desired depress "Y" (YES); if not, press "N" (NO), respond by inputting "Y" (YES) on "N" (NO) as desired.

- The next prompt will appear as follows:

```
IS THIS TEPE INITIALIZE ? (Y/N)
```

Fig. 5-17 Second MCMT Check Test Prompt

Examine the tape and respond with "Y" to this prompt if the tape data may be destroyed. Otherwise, key in "N".

- A Rewind/Fast Feed and Read/Write check tests are performed after the following information message is displayed:

```
MCMT CHECK (REWIND ,F.F & READ/WRITE CHECK)
```

Fig. 5-18 MCMT Check Test Information Message

- The third prompt appears as follows:

```
WRITE TAPE INFMASION TO THIS TAPE ? (Y/N)
```

Fig. 5-19 Third MCMT Check Test Prompt

- The test ends with the following information message:

```
WRITE DATA & STOP
HEAD OFF
```

Fig. 5-20 MCMT Check Test End Message

(6) DIP SW Read Check

- The following information is displayed:

```
        87654321   ← DIP switch SW4 elements 1 through 8
INITIAL=00101111 ┐
        00101111 ┘ ← Element setting
```

Fig. 5-21 DIP SW Read Check Test Data

- Make sure that the DIP switch setting agrees with the following table.

Table 5-3 DIP Switch of Settings

SW4 Setting / Character set specification	SW4							
	1	2	3	4	5	6	7	8
ASCII (USA)	1	1	1	1	0	1	0	0
French	0	1	1	1	0	1	0	0
German	1	0	1	1	0	1	0	0
English	0	0	1	1	0	1	0	0
Danish	1	1	0	1	0	1	0	0
Swedish	0	1	0	1	0	1	0	0
Norwegian	0	1	1	0	0	1	0	0
Italian	1	0	0	1	0	1	0	0
Spanish	0	0	0	1	0	1	0	0
HASCI	0	0	0	0	0	1	1	0
Japanese (Japanese language)	1	0	0	0	0	1	0	0
Japanese (kana)	0	0	0	0	0	0	0	0
Japanese (touch 16)	1	0	0	0	0	0	0	0

(7) Keyboard Check

Step 1: Select your keyboard type by responding with the number following the specification of your unit.
The following display data prompt will appear:

```
THEN DSP DATA KEY-IN !!
```

Fig. 5-22 Keyboard Test Display Data Prompt

Step 2: In response to the above prompt, key in characters to be displayed in the following order:

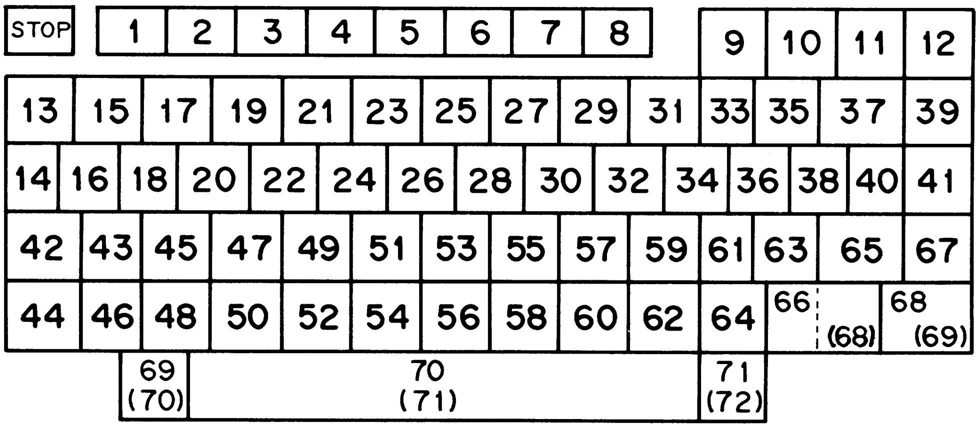


Fig. 5-23 Keyboard Check Test Character Data Entry

* The numbers within the parentheses are for a 73-key keyboard.

● When the key data entry ends, the following prompt appears.

```
ONCE MORE KEY-BOARD CHECK ? (Y/N)
```

Fig. 5-24 Keyboard Check Part 2 Test Entry Prompt

Step 3: If the keyboard check, part 2, test is desired, respond with "N" to this prompt. Otherwise, key in "Y". The above part 1 test will be repeated.

● The program enters the part 2 test and displays the following prompt:

```
KEY-BOARD CHECK Part 2
      PUSH KEY-IN !!
```

Fig. 5-25 Keyboard Check Part 2 Test Prompt

Step 4: Key in the same characters as randomly displayed, following the above prompt.

Step 5: To terminate the test, key in "Break". The program will end the test leaving the following information message:

```
KEY-BOARD CHEK Part 2 END !!
```

Fig. 5-26 Keyboard Check Test End Message

(8) Analog Input Check

Step 1: Connect a DC voltage regulator (output voltage range should be from 0V to +2.0V) and a dry-cell battery. Use the cable assembly P/N B778400201 according to the instructions in section 5.1.

- The program displays the connected voltage at an accuracy of $\pm$0.02V.

Step 2: When a DC voltage regulator is used, compare the displayed value with the reading. If a dry-cell battery is used, measure and compare its voltage.

(9) Barcode Check

- The following is displayed:

```
INPUT
```

Fig. 5-27 Barcode Check Test Prompt

Step 1: Read the barcode pattern using a reader.

- If the pattern and read data agree, "OK" appears on the LCD panel.

(10) Clock Check

- The following prompt appears:

```
TIME SET ? (Y/N)
```

Fig. 5-28 Time Setting Prompt

Step 1: If you would like to seft the time, respond with "Y" to this prompt; otherwise, key in "N".

- When "Y" is keyed in above, the time setting guide message is displayed:

```
INPUT DATA  Year/ Month/ Day/ Hour: Minute: Sec / Week
Week Data Code
         Sun:00 Mon:01 Tue:02 Wed:03 Thu:04 Fri:05 Sta:06
```

Fig. 5-29 Time Setting Guide Message

Step 2: Key in the date and time as follows: year, month, day, week day, hour, minute, and second.

- The set time should be updated every one second.

5.2.6 Test Program Messages

The test program displays a message on the LCD panel when it terminates normally terminates. When any malfunction is found, a diagnostic code indicates the problem area.

Major error messages are explained in the following:

(1) Return codes from slave CPU 6303

The slave CPU operation being performed when an error occurs is indicated on the LCD panel as a one-byte return code as shown in Fig. 5-30. Table 5-4 lists all the available return codes and summarizes their meaning.

```
EPSP ERROR !! **
```

Fig. 5-30 Error Message Format

Table 5-4 Slave CPU Return Codes and Their Meaning

Device	Code	Meaning
SYS	00	Normal processing termination
SYS	01	Break ACK – Indicates that a break took place.
SYS	02	Command error – Indicates that a command has been input which is not included in the de- fined system
SYS	03	Communication error – Indicates that a command is received when data was to be recei- ved/sent or vice versa.
2CD	11	Illegal size – Indicates that a screen-over occured which is attributable to an illegal size specification.
2CD	12	An undefined graphic alphabetic character was used.
2CD	13	An alphabetic character code was used. Or, an attempt was made to define any other than that for alphabetic character.
MCT	41	Head error – Indicates that the head failed to operate normally.
MCT	42	The tape stopped during processing.
MCT	43	Write protect error – An attempt was made to write a tape with no write protect pin.
MCT	44	Data error – Indicates that the data could not be determined to be either 1 or 0 because the data pulse is wider or narrower than the standard value.
MCT	45	CRC error
ESPS	61	A linkage failed.
ESPS	62	Communication error – Overrun or framing error.
ESPS	63	Timer over
BEEP	71	BEEP already in progress – Indicates that a BEEP or MELODY was attempted when another BEEP or MELODY was already in progress.
MCT	46	Block mode error – A block whose identifier is other than that specified.

(2) RAM error messages

```
ERROR !! ADDRESS  ****H
         WRITE DATA  **H READ DATA  **H
```

Fig. 5-31

D-RAM compare error – Written and read-back data did not agree.

```
ERROR !! BEFORE ADDRESS  ****H
          SAVE DATA  ** READ DATA   **H
```

Fig. 5-32

D-RAM compare error – The RAM test was attempted on a program area (including OS, TPA, and RAM files) where no read/write test is allowed.

```
VRAM EERROR ADDRESS  ****H
         WRITE  **H READ  **H
```

Fig. 5-33

V-RAM compare error – Written and read-back data did not agree.

(3) RS-232C and Serial Interface error messages

```
RS232C CHECK TIME OUT !!
```

Fig. 5-34

RS-232C transmission/reception failure – DIR → DSR, RTS → CTS → CD, TXD → RXD

```
RS232C ERROR TRNSMIT  ****H RECIVE  ****H
```

Fig. 5-35

RS-232C transmitted/received data failed to agree.

```
ERROR CODE **
```

Fig. 5-36

An RS-232C error code XX –
- 08: Parity error
- 10: Overrun error
- 20: Framing error

```
HIGH SPEED SERIAL I/O ERROR !!
     TRANSMIT DATA  ****H RECIVE DATA  ****H
```

Fig. 5-37

Data transmitted/received via the serial interface failed to agree.

(4) Microcassette tape drive error messages

```
MCMT INITIALIZE (READ ERROR) TIME UP !!
```

Fig. 5-38

Microcassette tape initialization failure – possibly a mechanical fault.

```
MCMT WIND &F.F TEST CHECK COUNT   ****
                   RESULT COUNT   ****
```

Fig. 5-39

Tape count (photo-reflector output) error during rewind/fast feed.

```
MCMT READ/WRITE CHECK HEAD ERROR !!
```

Fig. 5-40

Read/write head loading/unloading failure.

```
MCMT READ/WRITE CHECK TAPE STOP ERROR !!
```

Fig. 5-41

Tape feed failure during read/write – the reel stops rotating.

```
MCMT READ/WRITE CHECK ERROR !!
 RDC ERROR !! CODE   **
```

Fig. 5-42

Read/write error – possibly an abnormal tape feed speed or improper read/write pulse width.

```
MCMT READ/WRITE CHECK READ ERROR !!
READ   **      WRITE E5
BLOCK COUNT  ****   TO   ****
```

Fig. 5-43

Compare error – written and read-back data failed to agree.

```
THIS TAPE CAN'T WRITE
  CHANGE ANOTHER TAPE !!
```

Fig. 5-44

Write failure.

```
LET'S CHAGE THE MC-TAPE !!
```

Fig. 5-45

Read failure.

(5) Keyboard error message

```
ONCE MORE KEY-IN !!
KEY-CODE ERROR !!
```

Fig. 5-46

Key entry code mismatch – a key code other than the specified one was input. Up to five key entry retrials are allowed.

(6) Barcode error message

```
FOUND    ******
BARCODE ERROR CHECK ERROR
TRY ONCE MORE !!
```

Fig. 5-47

Barcode pattern read failure.

Unit Level Troubleshooting

When trouble-shooting a faulty unit, first find the entry routine for that unit from the entry table. In such a case where there are more than one symptom is observed and symptoms vary during the course of troubleshooting, make it a practice to enter the troubleshooting procedures according to the symptom that occurred first.

Notes on using the flowcharts

1) The troubleshooting flowcharts do not necessarily include all information required for troubleshooting such as check modes, etc. Thus, the flowchart context and trouble symptoms should be closely examined.
2) If the troubleshooting flowchart instructions lead you into a loop or to the end of a procedure and the problem is not resolved, refer to the schematic drawings or proceed by troubles shooting according to the following procedure:

Step 1: Replace the faulty unit with a good one and make sure that the faulty unit is really malfunctioning.

Step 2: If the problem is difficult to reproduce or occurs so briefly that it is hard to examine the symptom, vary the supply voltage according to the following instructions:
- (a) Disconnect the battery from the battery connector CN2.
- (b) Prepare a variable (0 – 10) DC voltage regulator and make sure that the output is turned off.
- (c) Connect the regulator to the CN2 connector in place of the battery.
- (d) Adjust the regulator output voltage to +5V.
- (e) Turn the regulator output on.

After the above setup is completed, vary the regulator output in a range from 4.8V to 6.0V and examine the unit operation at each voltage level. If this voltage margin test is successful maintain the voltage and proceed with troubleshooting, using tne check-out procedure and troubleshooting flowchart.

5.3 Check-out Procedure

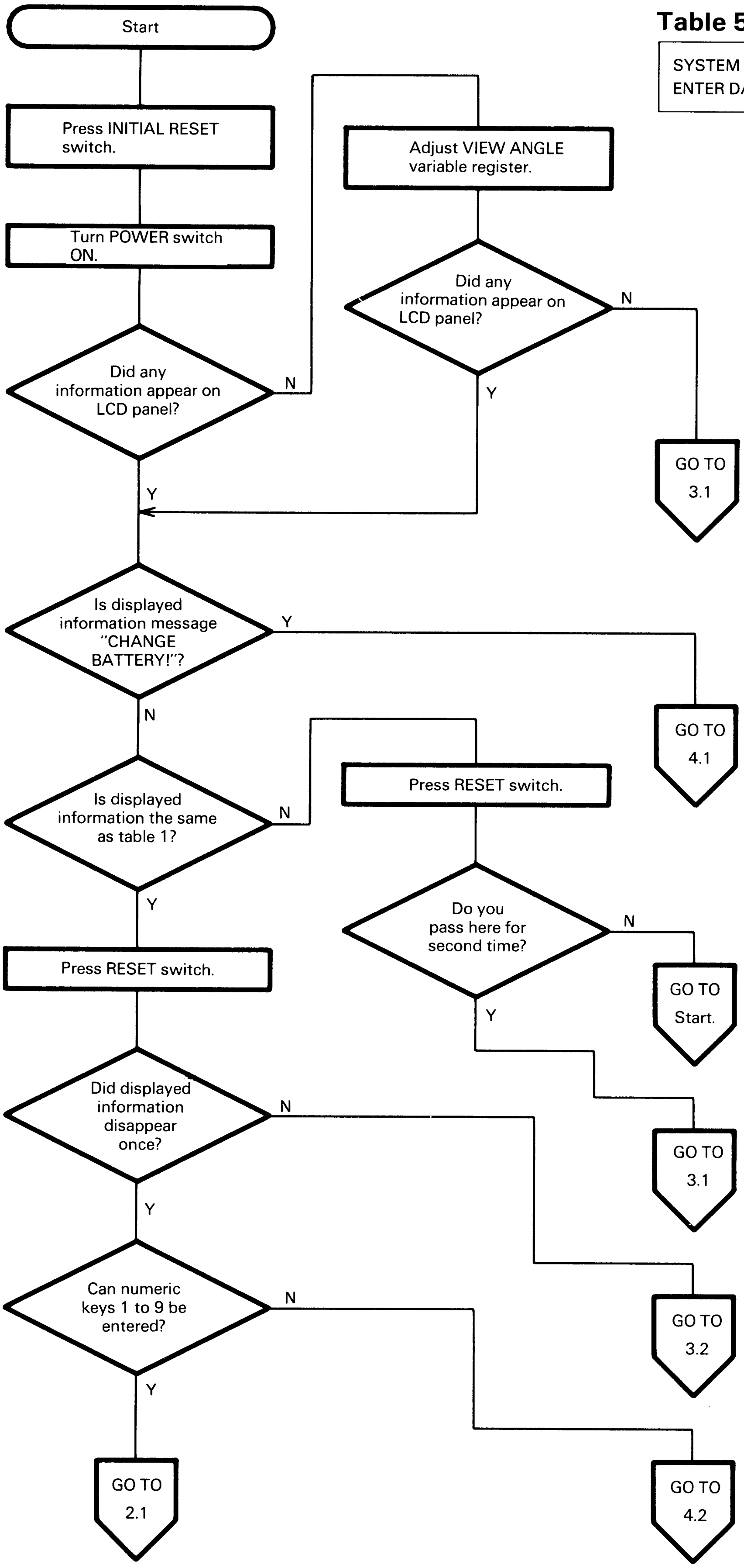
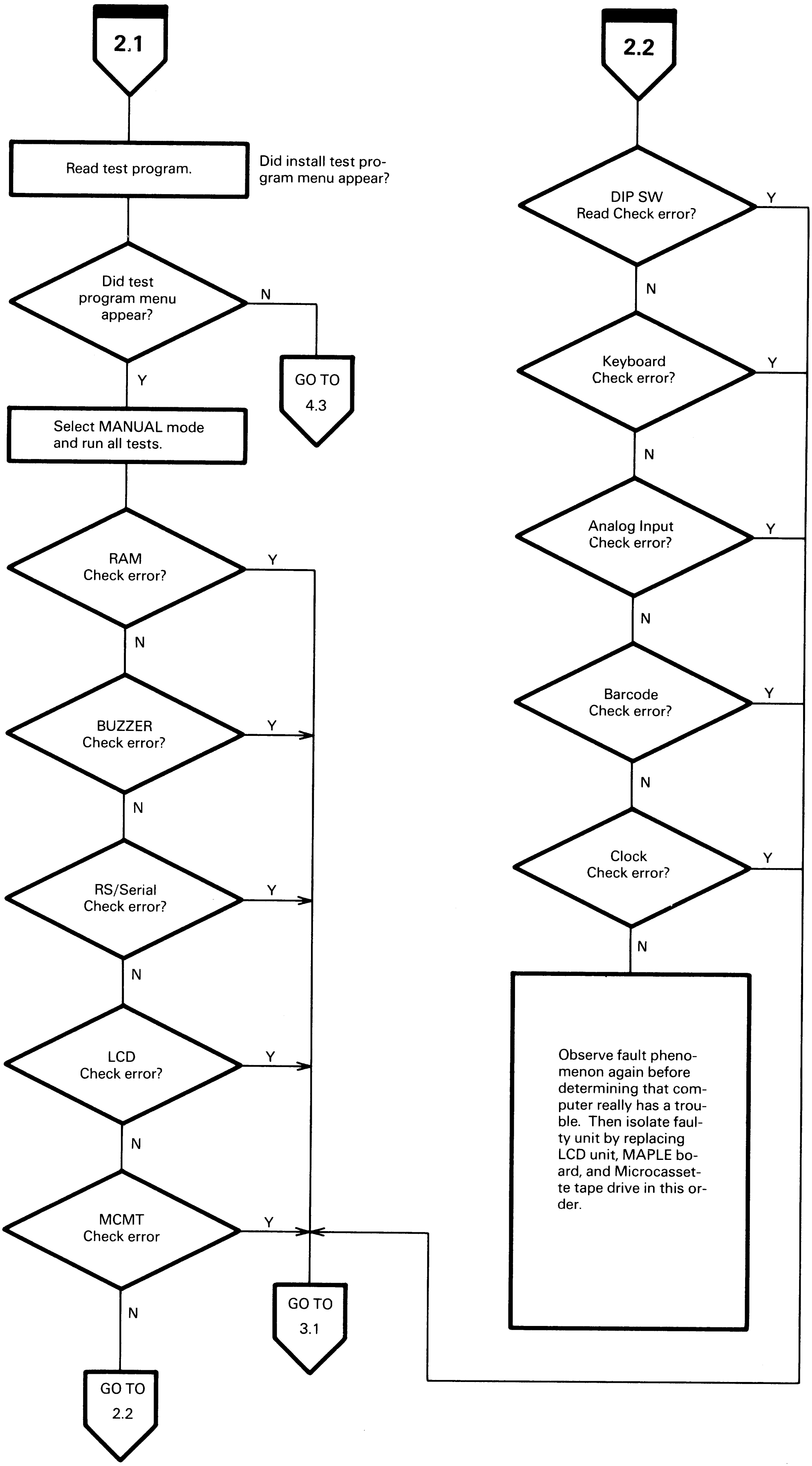
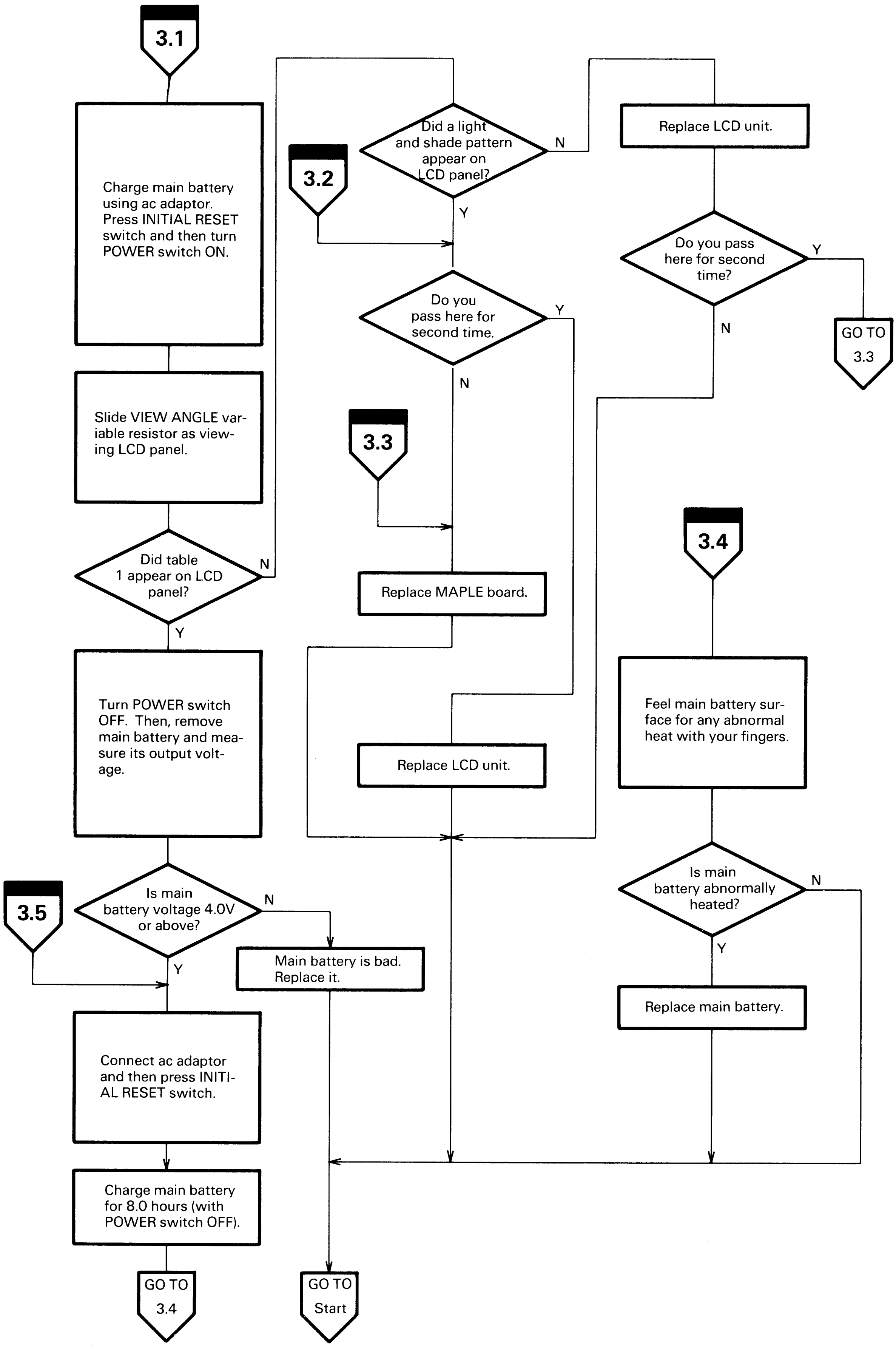


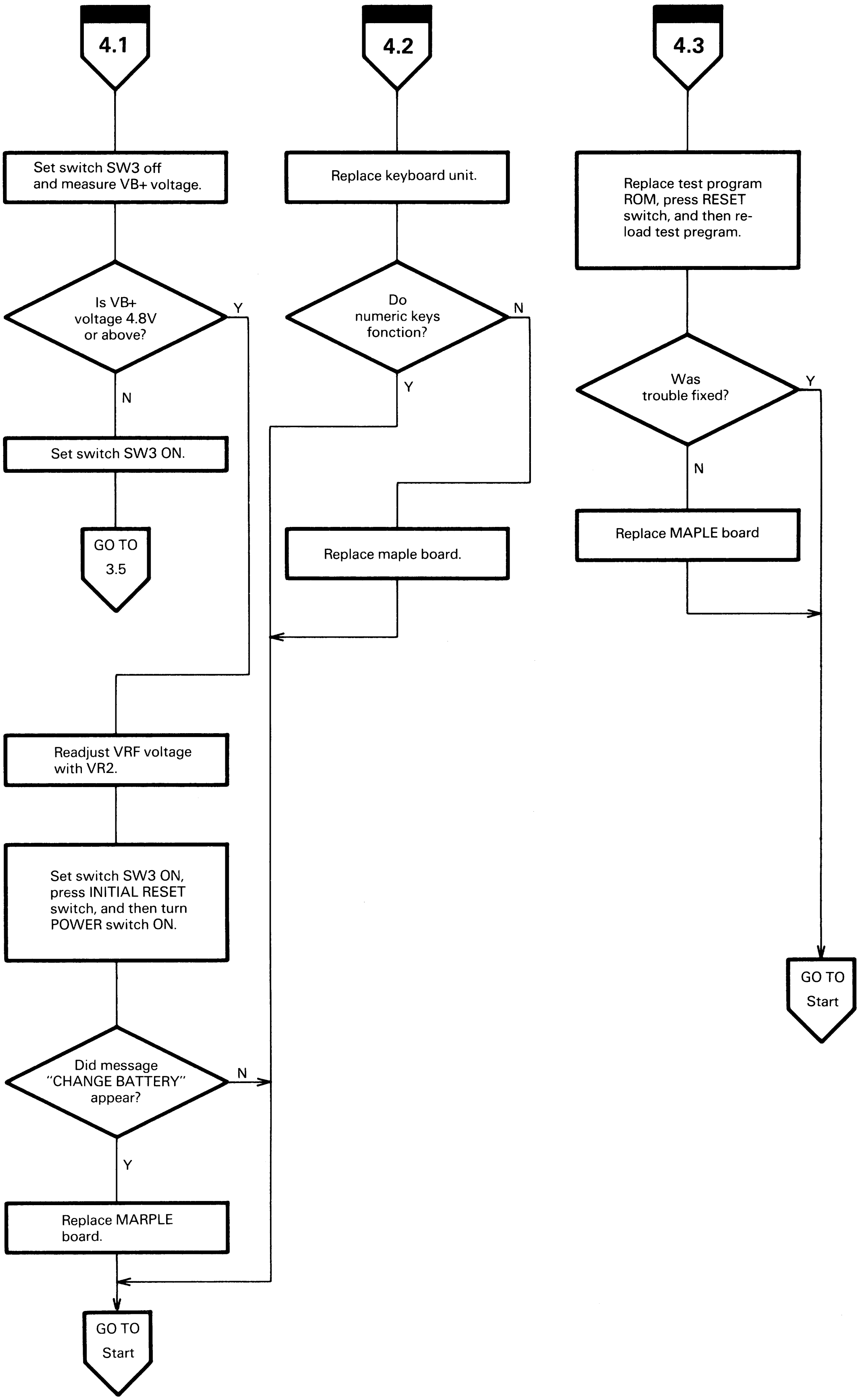
Table 5-1

SYSTEM INITIALIZE	
ENTER DATE TIME (YYMMDDhhmmss)	000000000000



2.1
Read test program.
Did install test program menu appear?
Did test program menu appear?
N
GO TO 4.3
Y
Select MANUAL mode and run all tests.
RAM Check error?
Y
N
BUZZER Check error?
RS/Serial Check error?
LCD Check error?
MCMT Check error
GO TO 3.1
GO TO 2.2
2.2
DIP SW Read Check error?
Keyboard Check error?
Analog Input Check error?
Barcode Check error?
Clock Check error?
Observe fault phenomenon again before determining that computer really has a trouble. Then isolate faulty unit by replacing LCD unit, MAPLE board, and Microcassette tape drive in this order.


3.1
Charge main battery using ac adaptor. Press INITIAL RESET switch and then turn POWER switch ON.
Slide VIEW ANGLE variable resistor as viewing LCD panel.
Did table 1 appear on LCD panel?
N
Y
Turn POWER switch OFF. Then, remove main battery and measure its output voltage.
3.5
Is main battery voltage 4.0V or above?
N
Y
Main battery is bad. Replace it.
Connect ac adaptor and then press INITIAL RESET switch.
Charge main battery for 8.0 hours (with POWER switch OFF).
GO TO 3.4
GO TO Start
Did a light and shade pattern appear on LCD panel?
N
Y
3.2
Do you pass here for second time.
Y
N
3.3
Replace MAPLE board.
Replace LCD unit.
Replace LCD unit.
Do you pass here for second time?
Y
N
GO TO 3.3
3.4
Feel main battery surface for any abnormal heat with your fingers.
Is main battery abnormally heated?
N
Y
Replace main battery.


4.1
Set switch SW3 off and measure VB+ voltage.
Is VB+ voltage 4.8V or above?
Y
N
Set switch SW3 ON.
GO TO 3.5
Readjust VRF voltage with VR2.
Set switch SW3 ON, press INITIAL RESET switch, and then turn POWER switch ON.
Did message "CHANGE BATTERY" appear?
N
Y
Replace MARPLE board.
GO TO Start
4.2
Replace keyboard unit.
Do numeric keys fonction?
N
Y
Replace maple board.
4.3
Replace test program ROM, press RESET switch, and then re-load test pregram.
Was trouble fixed?
Y
N
Replace MAPLE board
GO TO Start

5.4 Unit Troubleshooting

5.4.1 Repairing The MAPLE Board

The following should be noted when repairing the MAPLE board:

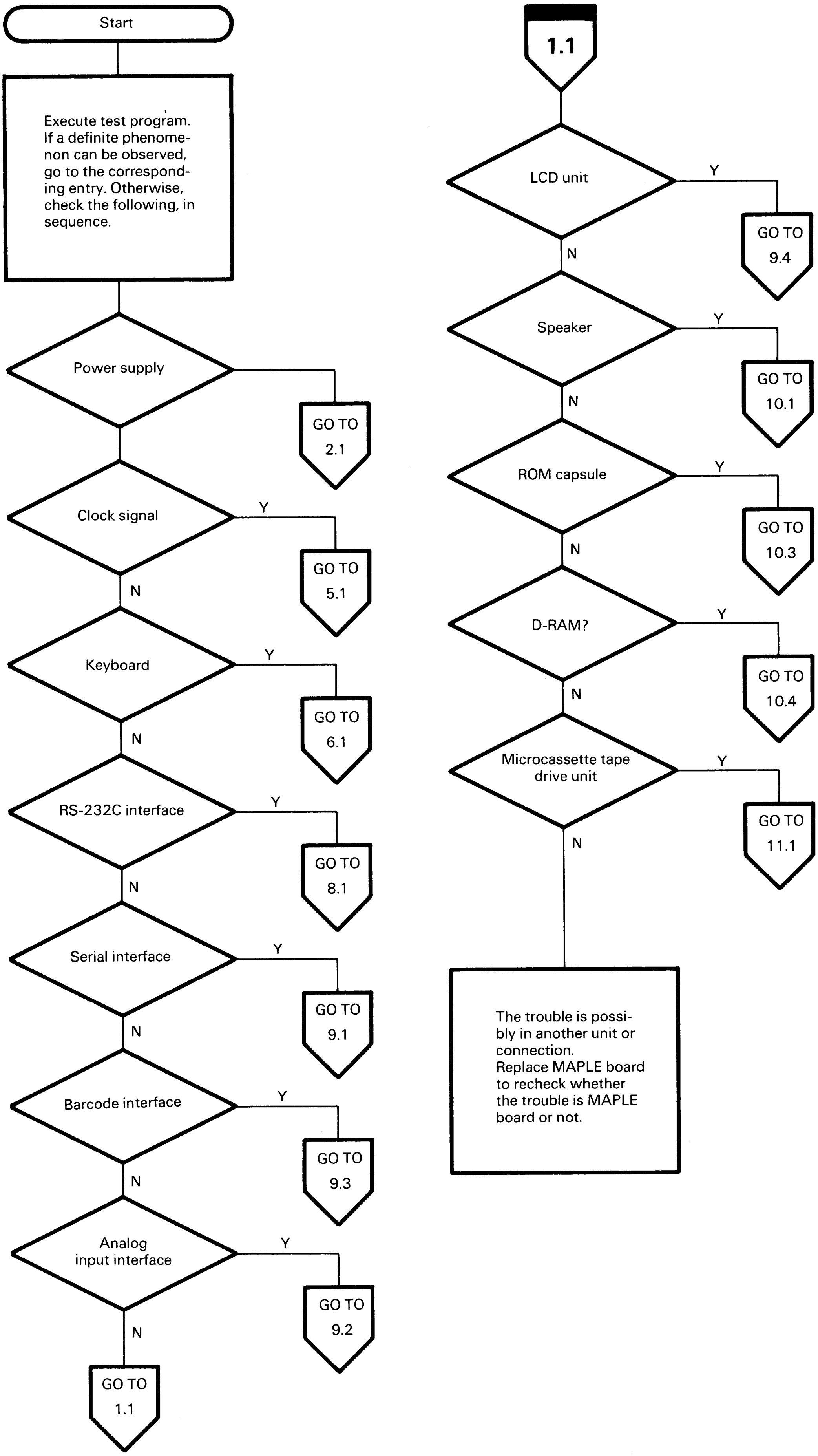
1) Check to see that the jumpers and switches are correctly set before proceeding with the repair.
2) Measure the voltage of the main and auxiliary batteries and verify whether the trouble is caused by insufficient voltage.
3) Care must be used to avoid short circuits on either side of the board. Any short circuit will short circuit the auxiliary battery resolting in damage to other circuits.
4) Before testing circuit continuity or element function with a circuit tester, make sure that the line or element to be tested is not backed up by battery. Whenever the battery backed-up line has to be checked, remove the auxiliary battery from the board before the test.

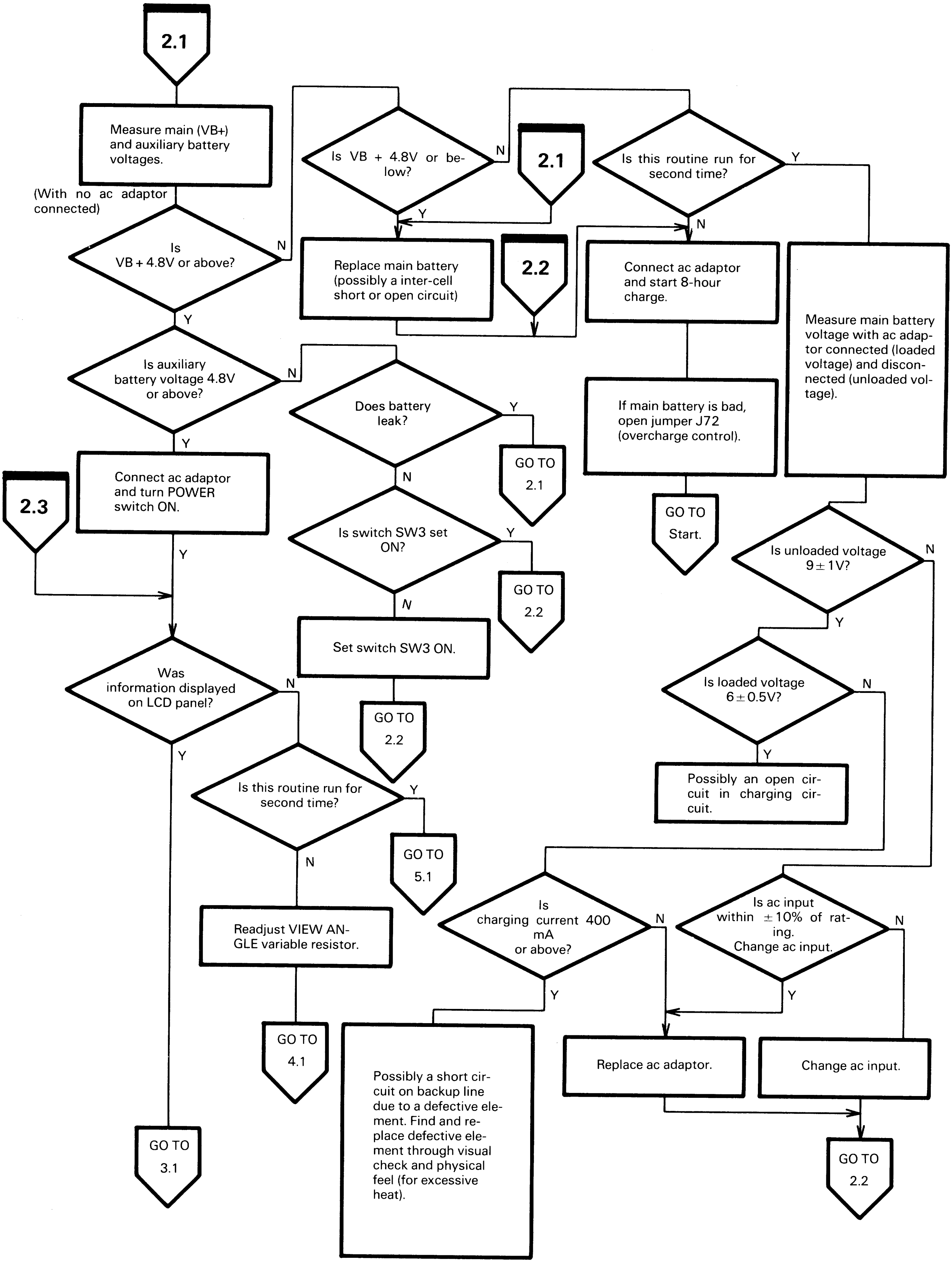
(Others)

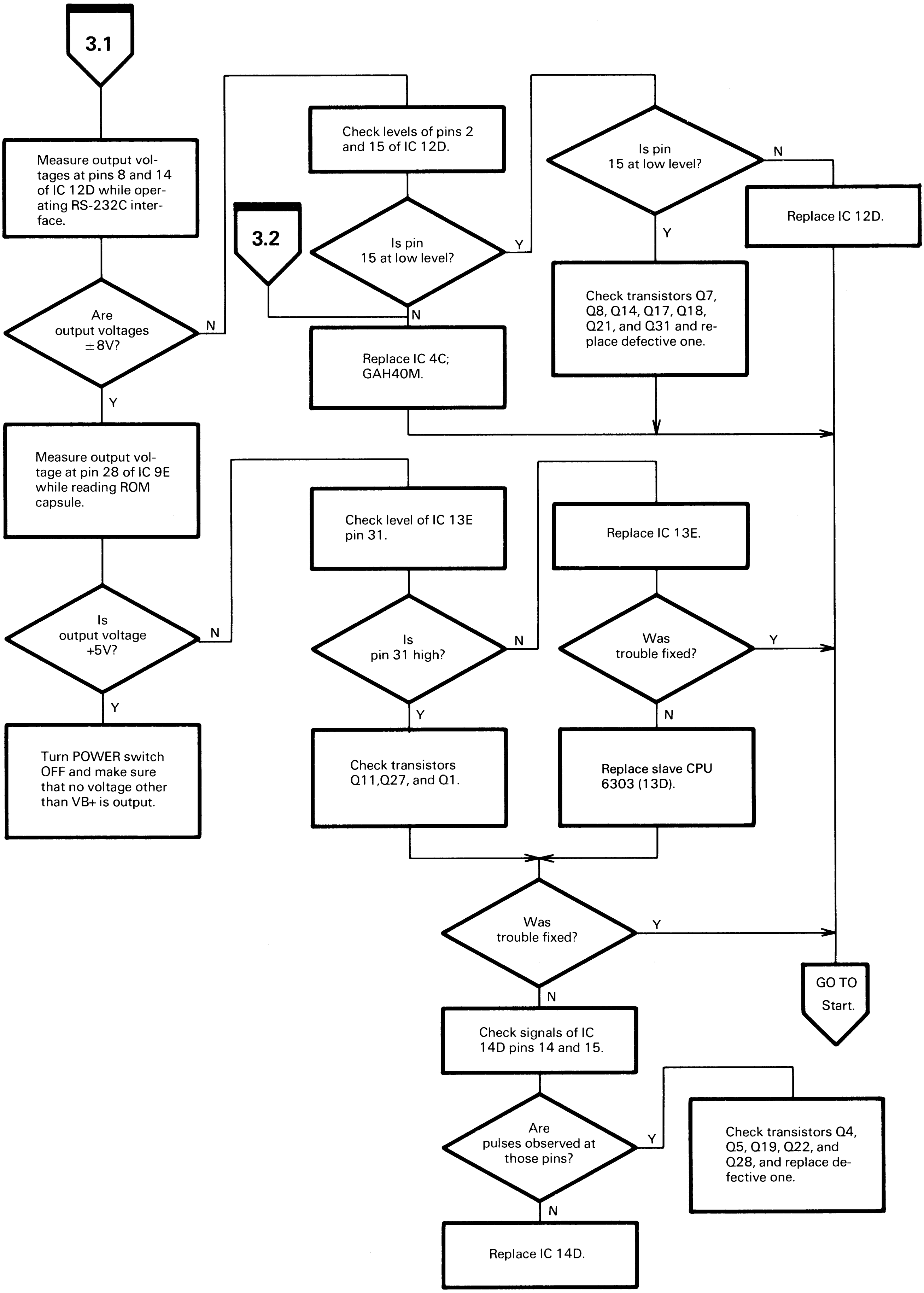
Depending on location of the problem, a MAPLE board failure may present various symptoms and troubleshooting is harder. Check the computer for any basic problem according to the procedure below, first. If no problem is found by these checks, use the troubleshooting and repair the test program and repair flowchart.

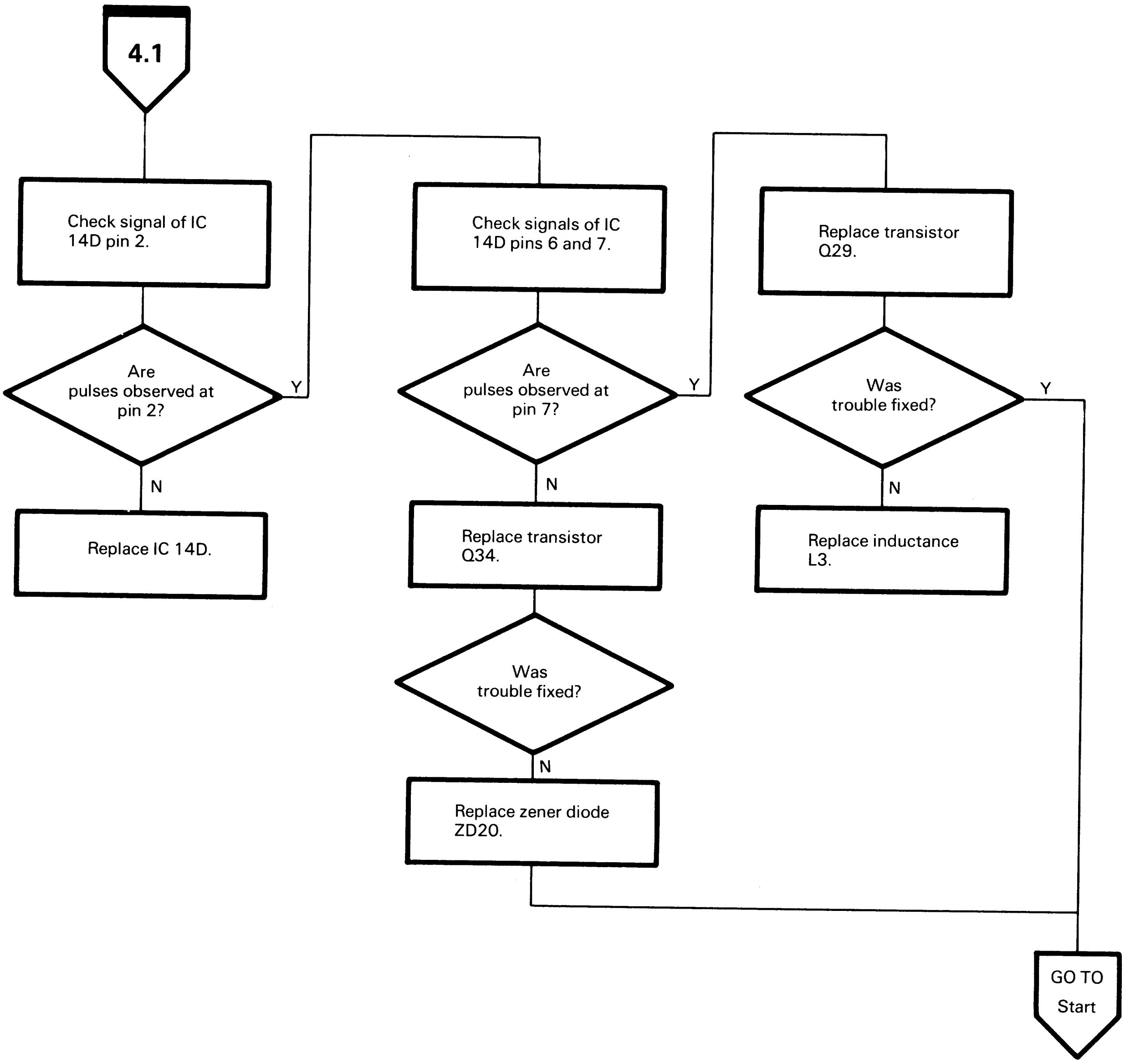
(1) Check the jumpers and switches for any improper setting.
(2) Check the logic circuit voltage and clock signal. (Also check fuse F1).
(3) Check the connectors for any imperfect contact.

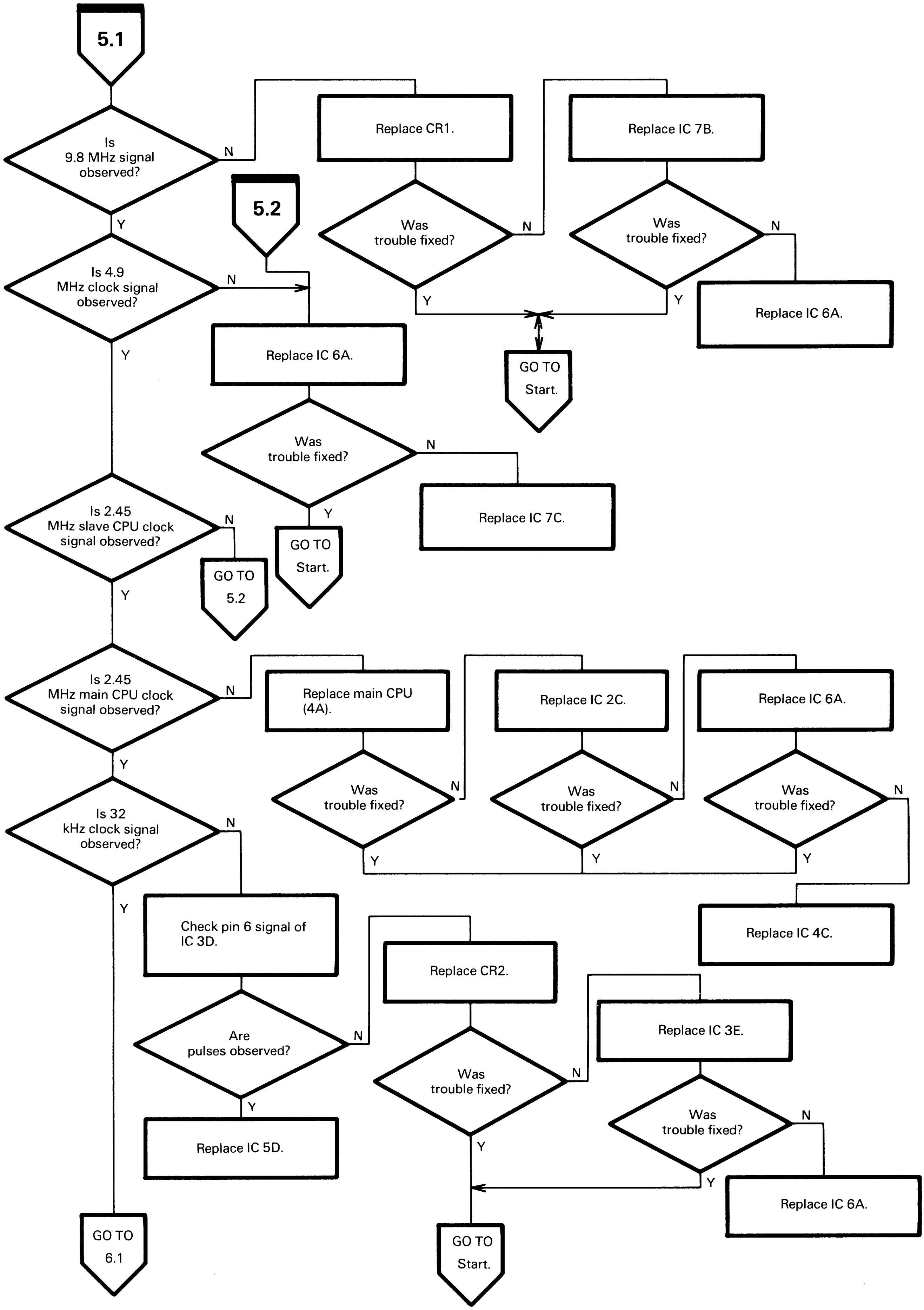
MAPLE BOARD REPAIR ENTRY TABLE

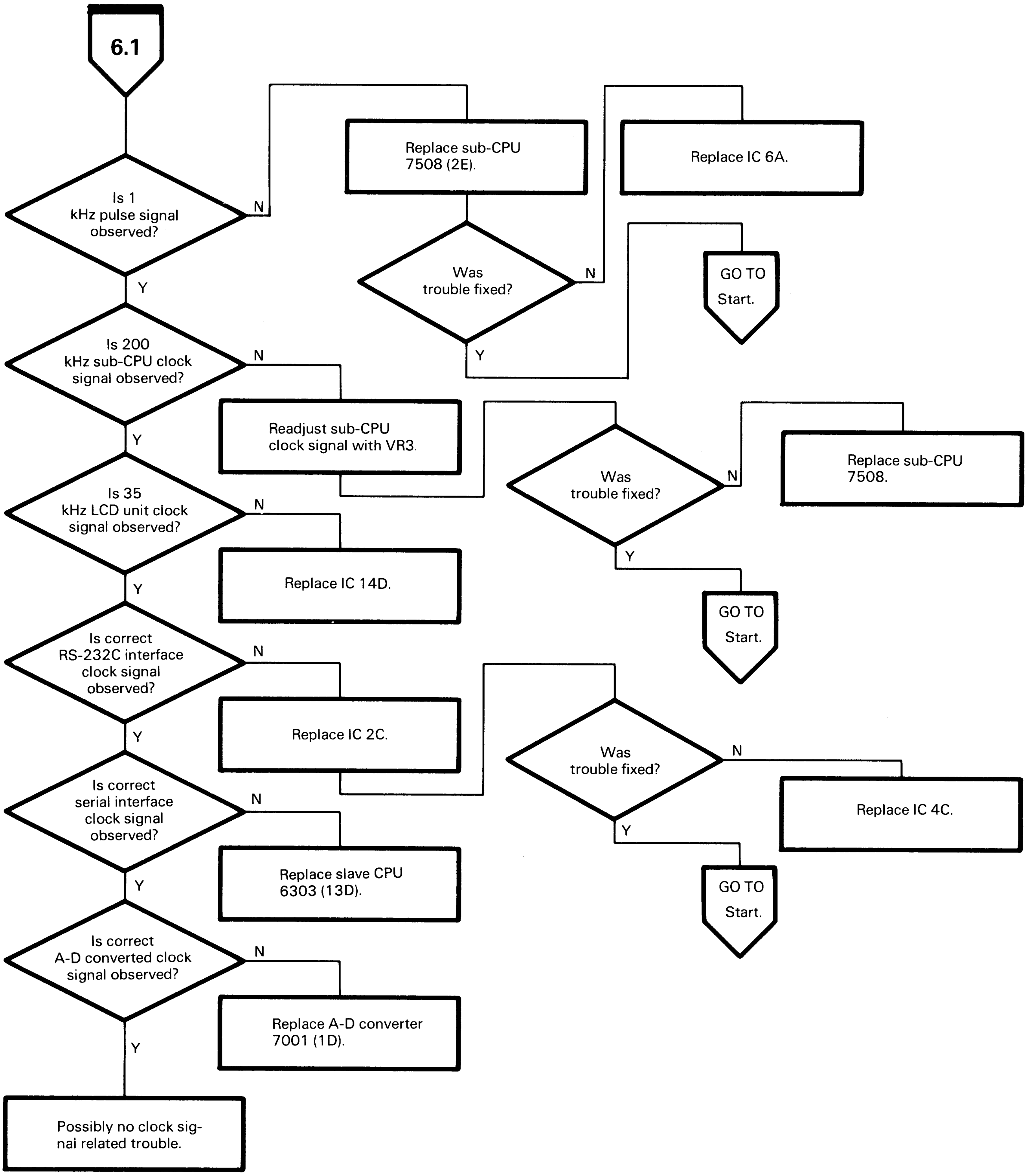


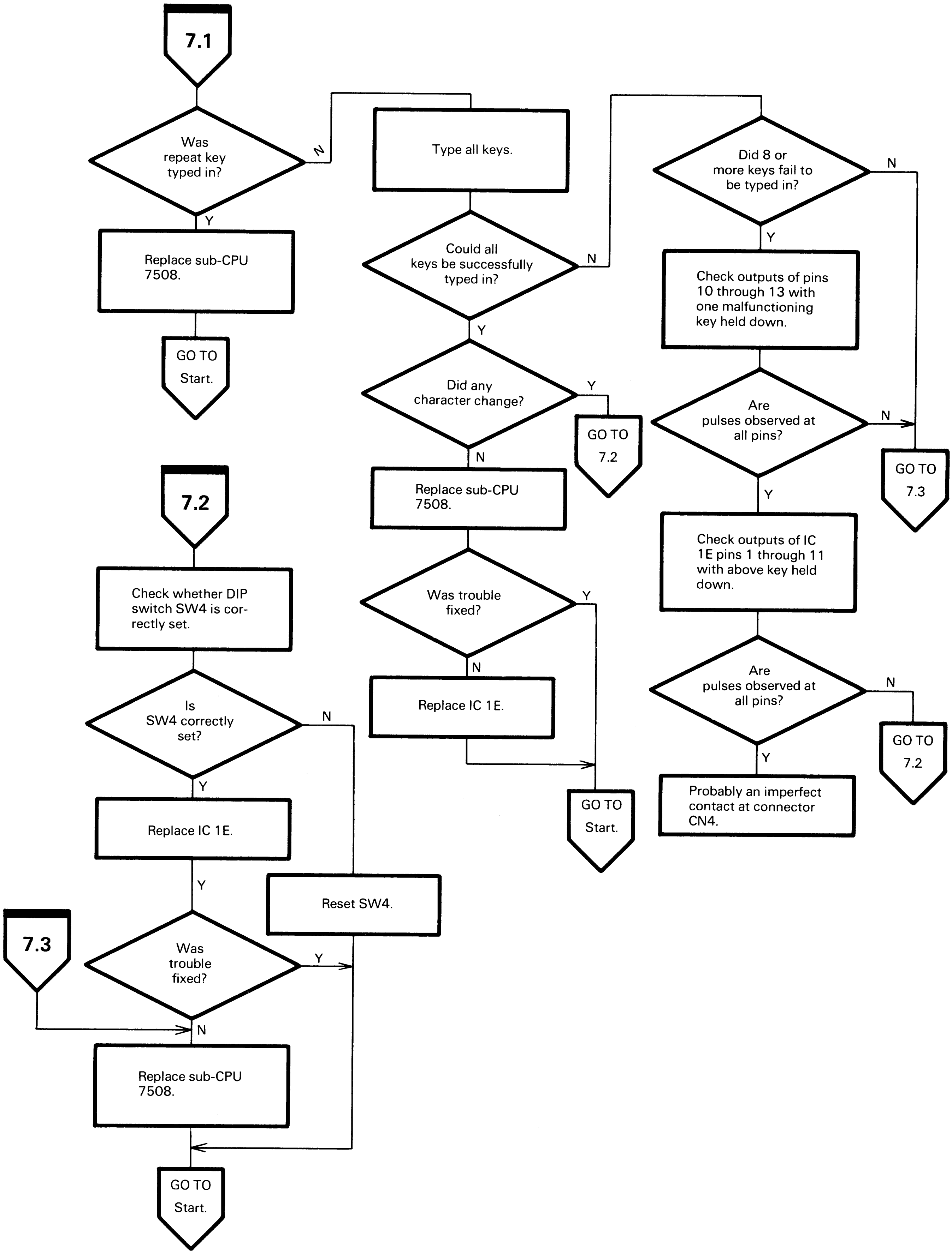

2.1
Measure main (VB+) and auxiliary battery voltages.
(With no ac adaptor connected)
Is VB + 4.8V or above?
N
Y
Is auxiliary battery voltage 4.8V or above?
N
Y
Connect ac adaptor and turn POWER switch ON.
Y
2.3
Was information displayed on LCD panel?
N
Y
GO TO 3.1
Is this routine run for second time?
Y
GO TO 5.1
N
Readjust VIEW ANGLE variable resistor.
GO TO 4.1
Is VB + 4.8V or below?
N
Y
2.1
Replace main battery (possibly a inter-cell short or open circuit)
2.2
Does battery leak?
Y
GO TO 2.1
N
Is switch SW3 set ON?
Y
GO TO 2.2
N
Set switch SW3 ON.
GO TO 2.2
Is this routine run for second time?
Y
N
Connect ac adaptor and start 8-hour charge.
If main battery is bad, open jumper J72 (overcharge control).
GO TO Start.
Measure main battery voltage with ac adaptor connected (loaded voltage) and disconnected (unloaded voltage).
Is unloaded voltage 9±1V?
N
Y
Is loaded voltage 6±0.5V?
N
Y
Possibly an open circuit in charging circuit.
Is charging current 400 mA or above?
N
Y
Possibly a short circuit on backup line due to a defective element. Find and replace defective element through visual check and physical feel (for excessive heat).
Is ac input within ±10% of rating. Change ac input.
N
Y
Replace ac adaptor.
Change ac input.
GO TO 2.2

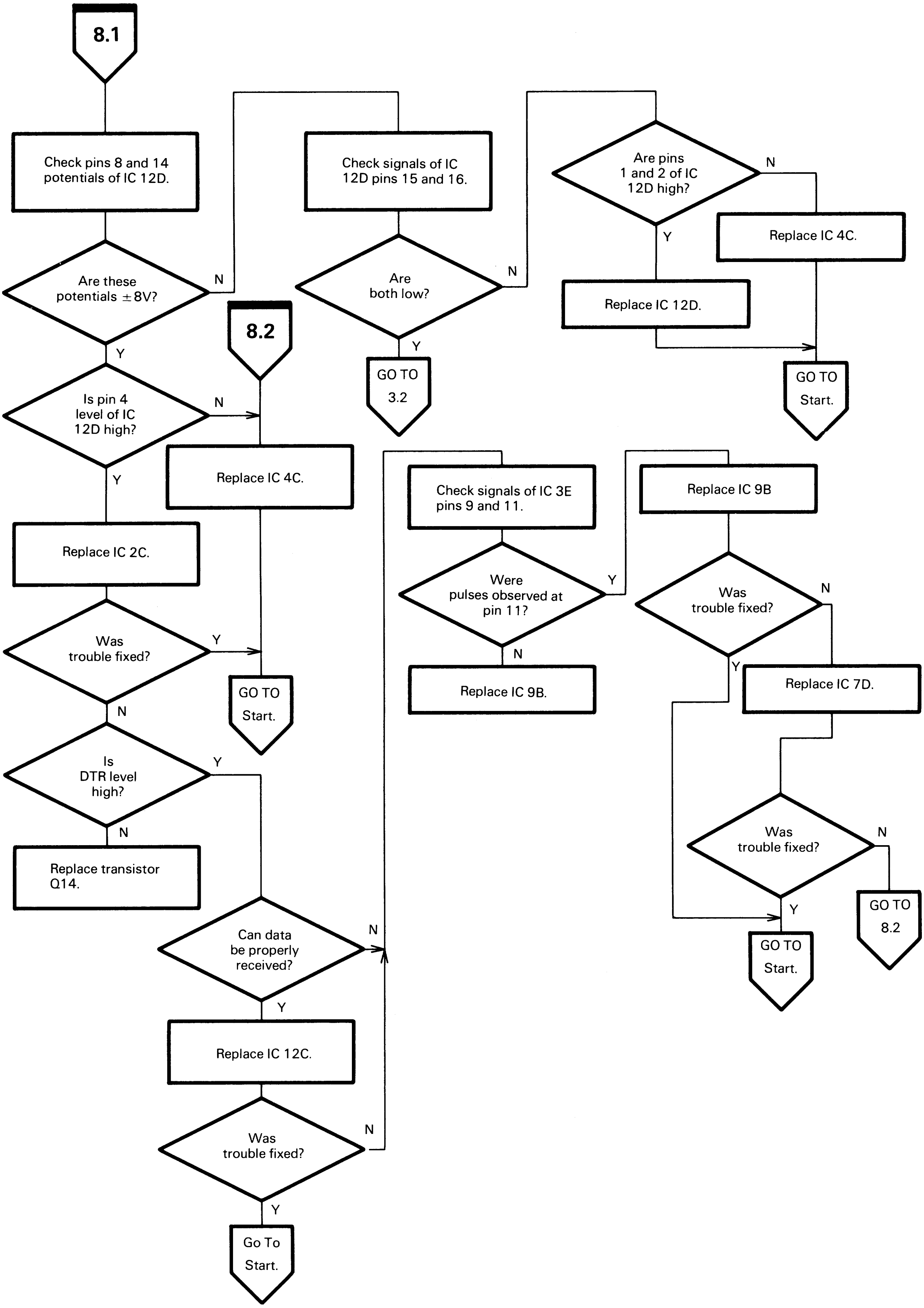

3.1
Measure output voltages at pins 8 and 14 of IC 12D while operating RS-232C interface.
Are output voltages ±8V?
N
Y
Check levels of pins 2 and 15 of IC 12D.
3.2
Is pin 15 at low level?
Y
N
Replace IC 4C; GAH40M.
Is pin 15 at low level?
N
Y
Replace IC 12D.
Check transistors Q7, Q8, Q14, Q17, Q18, Q21, and Q31 and replace defective one.
Measure output voltage at pin 28 of IC 9E while reading ROM capsule.
Is output voltage +5V?
N
Y
Turn POWER switch OFF and make sure that no voltage other than VB+ is output.
Check level of IC 13E pin 31.
Is pin 31 high?
N
Y
Check transistors Q11,Q27, and Q1.
Replace IC 13E.
Was trouble fixed?
Y
N
Replace slave CPU 6303 (13D).
Was trouble fixed?
Y
N
GO TO Start.
Check signals of IC 14D pins 14 and 15.
Are pulses observed at those pins?
Y
N
Check transistors Q4, Q5, Q19, Q22, and Q28, and replace defective one.
Replace IC 14D.

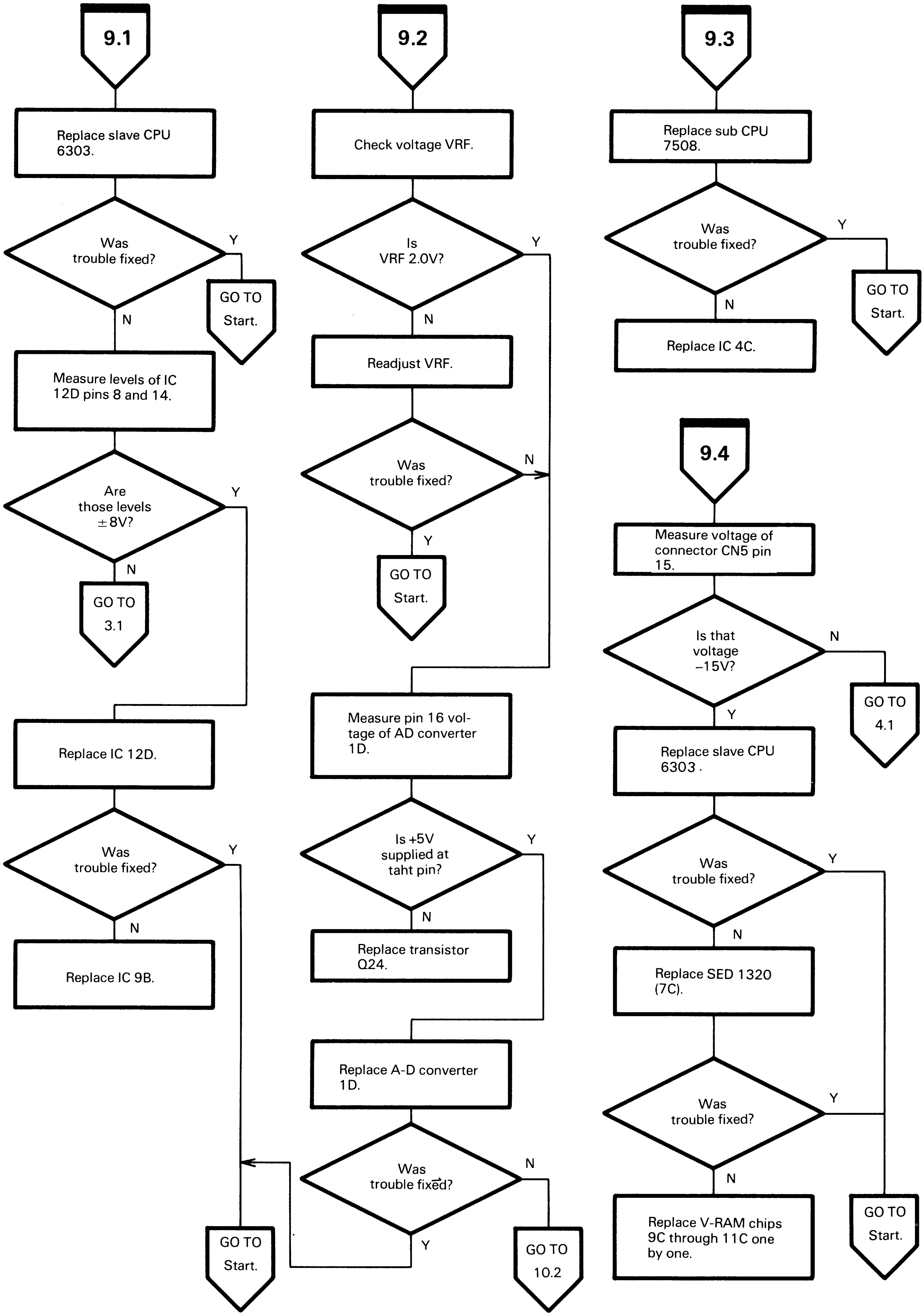

4.1
Check signal of IC 14D pin 2.
Are pulses observed at pin 2?
Y
N
Replace IC 14D.
Check signals of IC 14D pins 6 and 7.
Are pulses observed at pin 7?
Y
N
Replace transistor Q34.
Was trouble fixed?
N
Replace zener diode ZD20.
Replace transistor Q29.
Was trouble fixed?
Y
N
Replace inductance L3.
GO TO Start

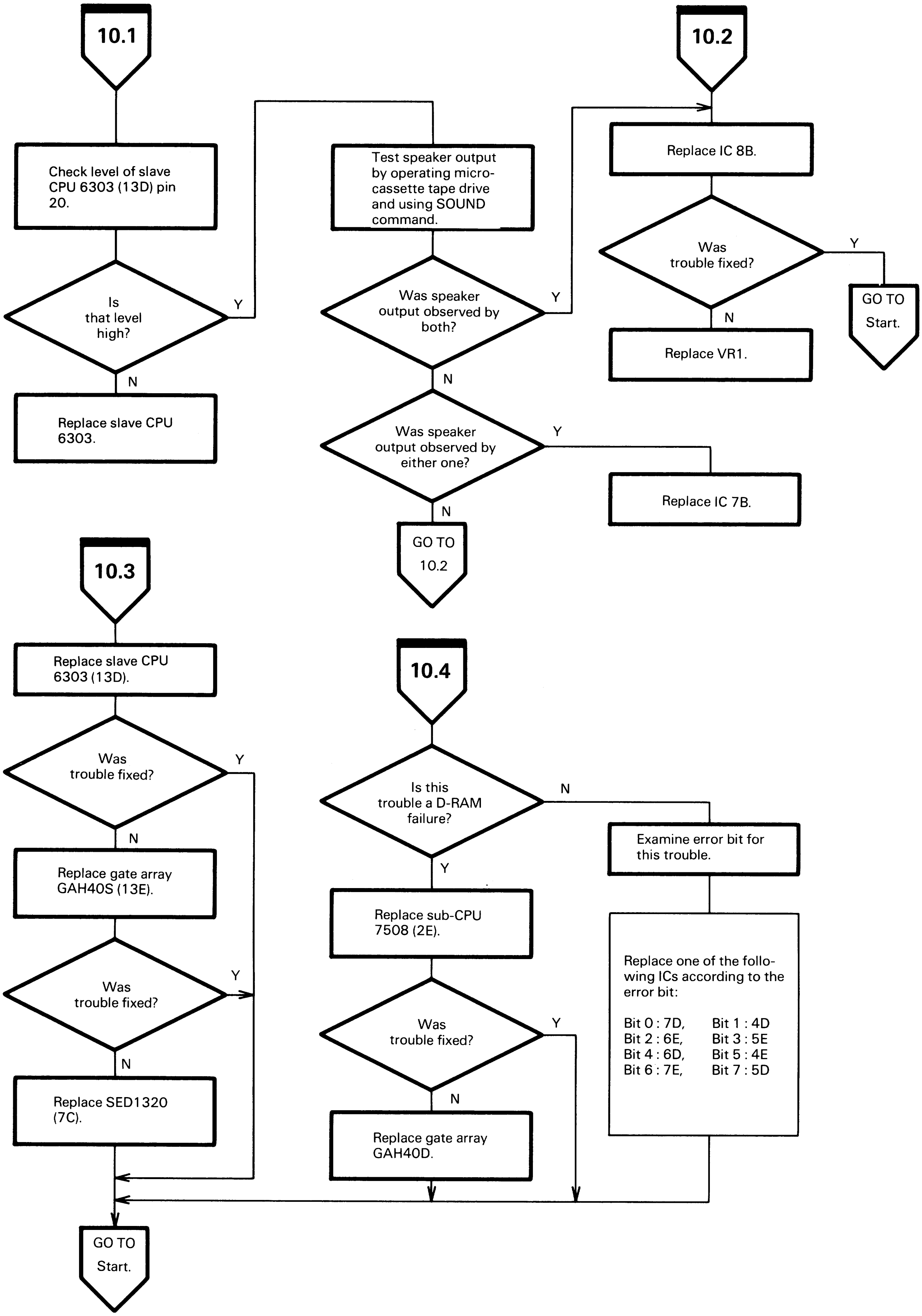

5.1
Is 9.8 MHz signal observed?
N
Y
Replace CR1.
Was trouble fixed?
N
Y
Replace IC 7B.
Was trouble fixed?
N
Y
Replace IC 6A.
GO TO Start.
5.2
Is 4.9 MHz clock signal observed?
N
Y
Replace IC 6A.
Was trouble fixed?
N
Y
GO TO Start.
Replace IC 7C.
Is 2.45 MHz slave CPU clock signal observed?
N
Y
GO TO 5.2
Is 2.45 MHz main CPU clock signal observed?
N
Y
Replace main CPU (4A).
Was trouble fixed?
N
Y
Replace IC 2C.
Was trouble fixed?
N
Y
Replace IC 6A.
Was trouble fixed?
N
Y
Replace IC 4C.
Is 32 kHz clock signal observed?
N
Y
Check pin 6 signal of IC 3D.
Are pulses observed?
N
Y
Replace IC 5D.
Replace CR2.
Was trouble fixed?
N
Y
Replace IC 3E.
Was trouble fixed?
N
Y
Replace IC 6A.
GO TO 6.1
GO TO Start.

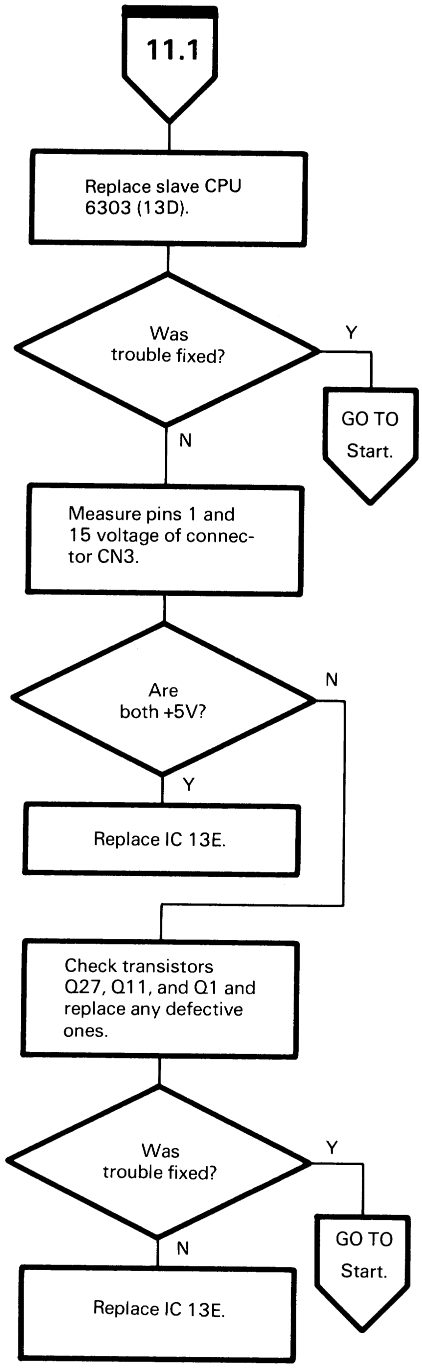

6.1
Is 1 kHz pulse signal observed?
N
Y
Replace sub-CPU 7508 (2E).
Was trouble fixed?
N
Y
Replace IC 6A.
GO TO Start.
Is 200 kHz sub-CPU clock signal observed?
N
Y
Readjust sub-CPU clock signal with VR3.
Was trouble fixed?
N
Y
Replace sub-CPU 7508.
GO TO Start.
Is 35 kHz LCD unit clock signal observed?
N
Y
Replace IC 14D.
Is correct RS-232C interface clock signal observed?
N
Y
Replace IC 2C.
Was trouble fixed?
N
Y
Replace IC 4C.
GO TO Start.
Is correct serial interface clock signal observed?
N
Y
Replace slave CPU 6303 (13D).
Is correct A-D converted clock signal observed?
N
Y
Replace A-D converter 7001 (1D).
Possibly no clock signal related trouble.


7.1
Was repeat key typed in?
N
Y
Replace sub-CPU 7508.
GO TO Start.
Type all keys.
Could all keys be successfully typed in?
N
Y
Did any character change?
Y
GO TO 7.2
N
Replace sub-CPU 7508.
Was trouble fixed?
Y
N
Replace IC 1E.
GO TO Start.
Did 8 or more keys fail to be typed in?
N
Y
Check outputs of pins 10 through 13 with one malfunctioning key held down.
Are pulses observed at all pins?
N
GO TO 7.3
Y
Check outputs of IC 1E pins 1 through 11 with above key held down.
Are pulses observed at all pins?
N
GO TO 7.2
Y
Probably an imperfect contact at connector CN4.
7.2
Check whether DIP switch SW4 is correctly set.
Is SW4 correctly set?
N
Y
Replace IC 1E.
Reset SW4.
Y
Was trouble fixed?
Y
7.3
N
Replace sub-CPU 7508.
GO TO Start.


8.1
Check pins 8 and 14 potentials of IC 12D.
Are these potentials ±8V?
N
Y
Is pin 4 level of IC 12D high?
N
Y
Replace IC 2C.
Was trouble fixed?
Y
N
Is DTR level high?
Y
N
Replace transistor Q14.
8.2
Replace IC 4C.
GO TO Start.
Can data be properly received?
N
Y
Replace IC 12C.
Was trouble fixed?
N
Y
Go To Start.
Check signals of IC 12D pins 15 and 16.
Are both low?
N
Y
GO TO 3.2
Are pins 1 and 2 of IC 12D high?
N
Y
Replace IC 4C.
Replace IC 12D.
GO TO Start.
Check signals of IC 3E pins 9 and 11.
Were pulses observed at pin 11?
Y
N
Replace IC 9B.
Replace IC 9B
Was trouble fixed?
N
Y
Replace IC 7D.
Was trouble fixed?
N
Y
GO TO Start.
GO TO 8.2


9.1
Replace slave CPU 6303.
Was trouble fixed?
Y
GO TO Start.
N
Measure levels of IC 12D pins 8 and 14.
Are those levels ±8V?
Y
N
GO TO 3.1
Replace IC 12D.
Was trouble fixed?
Y
N
Replace IC 9B.
GO TO Start.
9.2
Check voltage VRF.
Is VRF 2.0V?
Y
N
Readjust VRF.
Was trouble fixed?
N
Y
GO TO Start.
Measure pin 16 voltage of AD converter 1D.
Is +5V supplied at taht pin?
Y
N
Replace transistor Q24.
Replace A-D converter 1D.
Was trouble fixed?
N
Y
GO TO 10.2
9.3
Replace sub CPU 7508.
Was trouble fixed?
Y
GO TO Start.
N
Replace IC 4C.
9.4
Measure voltage of connector CN5 pin 15.
Is that voltage −15V?
N
GO TO 4.1
Y
Replace slave CPU 6303.
Was trouble fixed?
Y
N
Replace SED 1320 (7C).
Was trouble fixed?
Y
N
Replace V-RAM chips 9C through 11C one by one.
GO TO Start.


10.1
Check level of slave CPU 6303 (13D) pin 20.
Is that level high?
Y
N
Replace slave CPU 6303.
Test speaker output by operating micro-cassette tape drive and using SOUND command.
Was speaker output observed by both?
Y
N
Was speaker output observed by either one?
Y
N
GO TO 10.2
Replace IC 7B.
10.2
Replace IC 8B.
Was trouble fixed?
Y
N
GO TO Start.
Replace VR1.
10.3
Replace slave CPU 6303 (13D).
Was trouble fixed?
Y
N
Replace gate array GAH40S (13E).
Was trouble fixed?
Y
N
Replace SED1320 (7C).
GO TO Start.
10.4
Is this trouble a D-RAM failure?
N
Y
Examine error bit for this trouble.
Replace one of the following ICs according to the error bit:
Bit 0 : 7D, Bit 1 : 4D
Bit 2 : 6E, Bit 3 : 5E
Bit 4 : 6D, Bit 5 : 4E
Bit 6 : 7E, Bit 7 : 5D
Replace sub-CPU 7508 (2E).
Was trouble fixed?
Y
N
Replace gate array GAH40D.


11.1
Replace slave CPU 6303 (13D).
Was trouble fixed?
Y
GO TO Start.
N
Measure pins 1 and 15 voltage of connector CN3.
Are both +5V?
N
Y
Replace IC 13E.
Check transistors Q27, Q11, and Q1 and replace any defective ones.
Was trouble fixed?
Y
GO TO Start.
N
Replace IC 13E.

5.4.2 Repairing The LCD Unit

Before repairing the LCD unit, check the following:

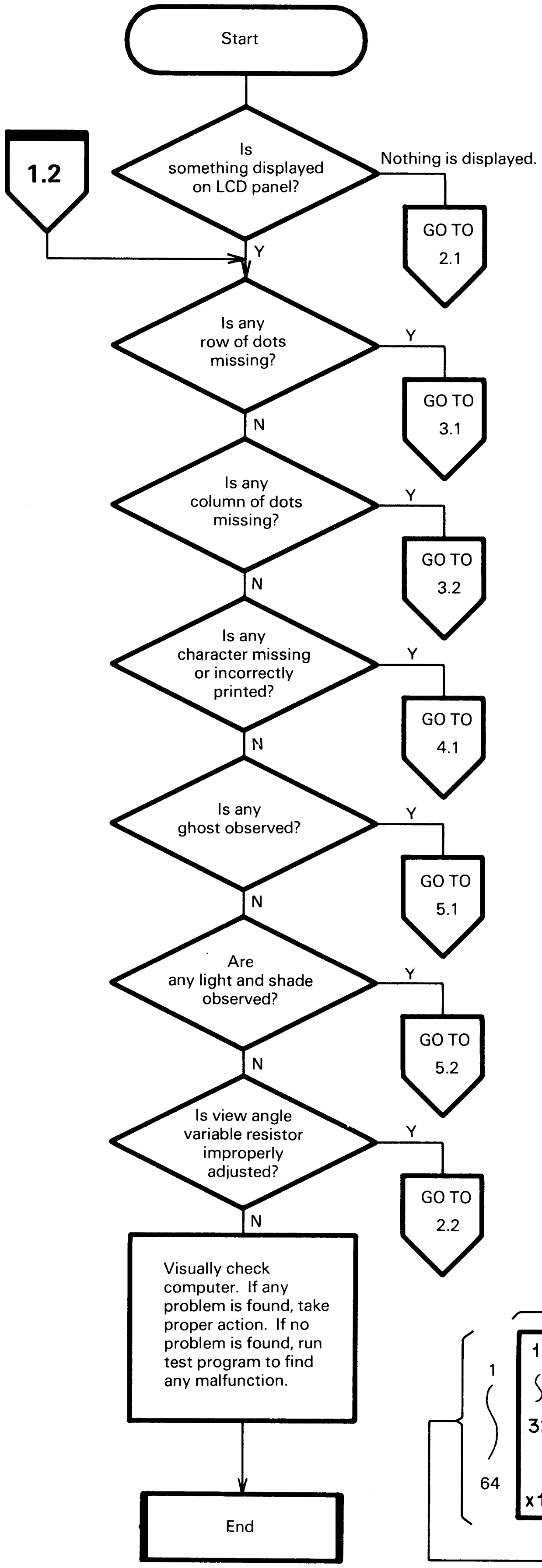
1) Check the LCD panel surface for damage.
2) Check for any shade on the LCD panel when power is off.
3) Check the LCD board for any damage.

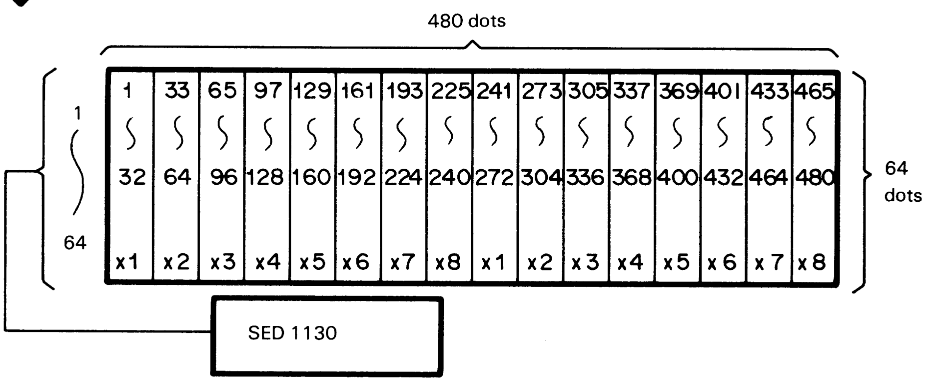
If a defect is found during the above checks, the LCD unit cannot be repaired. Replace the unit.

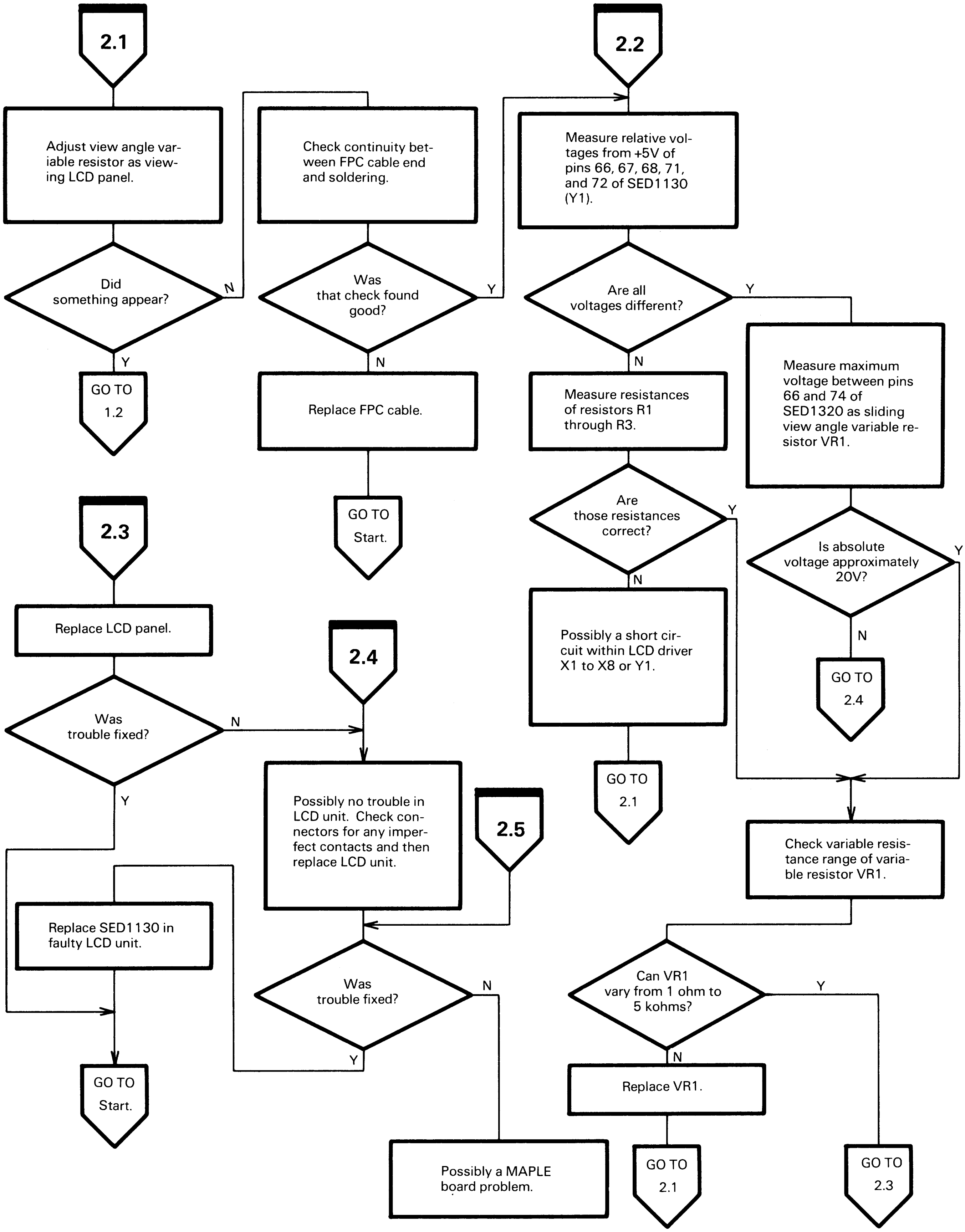
* When replacing a flat-package IC, follow the procedure below.

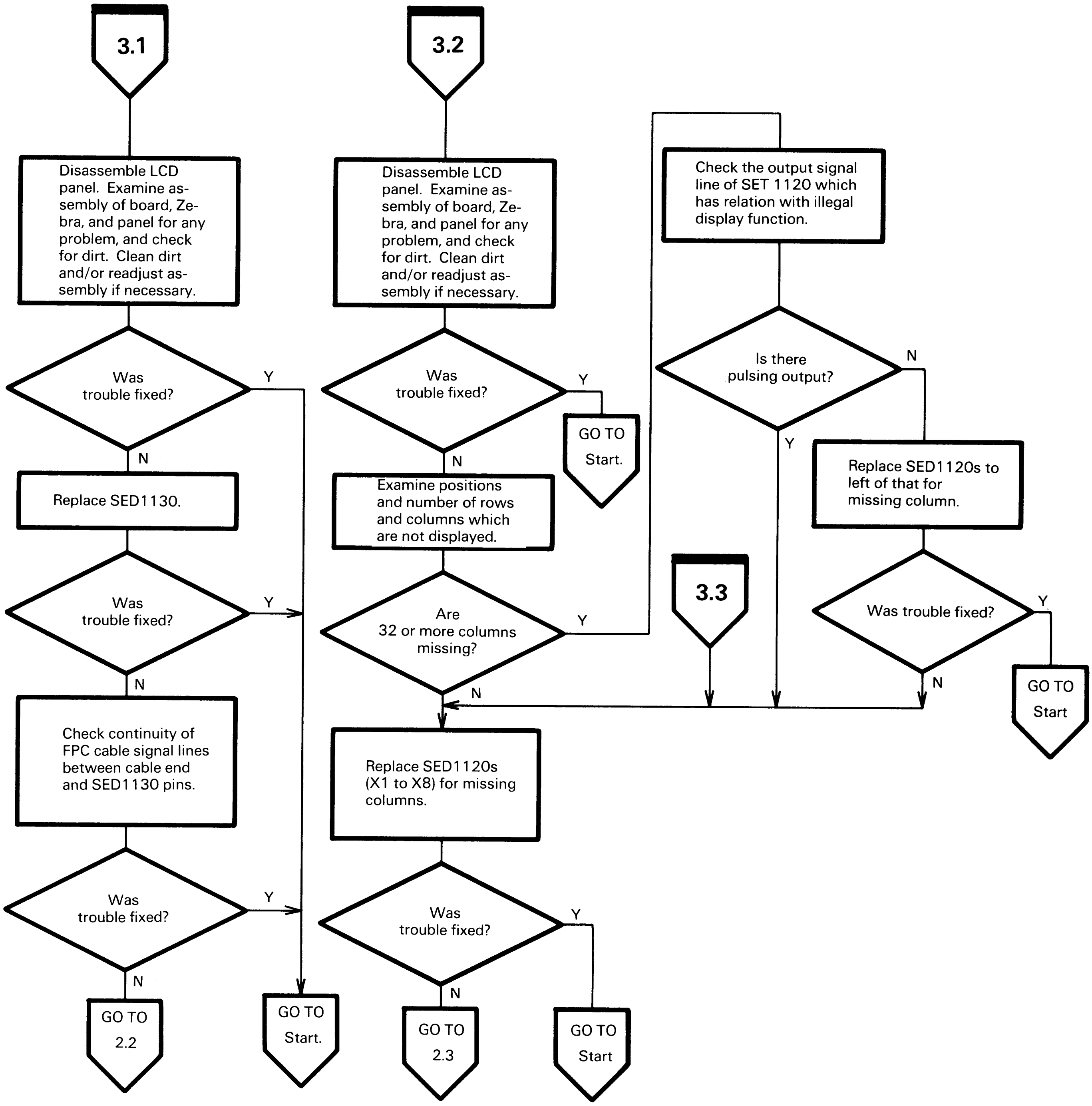
(1) Remove the solder from the IC terminal leads with a Solderwick.
(2) Lightly push the IC up with a precision screw driver.
    (Do not force the IC; otherwise, the printed circuit pattern may come off the board and the repair may become impossible).
(3) Remove the IC and remove the reamining solder from the pattern with the solder-wick.
(4) Bend the new IC terminal leads so that they fit to the pattern holes.
    (The terminal leads are bent downward when the IC is mounted on the head of the board and upward when mounted on the tail.)
(5) Resolder the new IC terminal leads.
(6) Remove the flux from the soldered area.

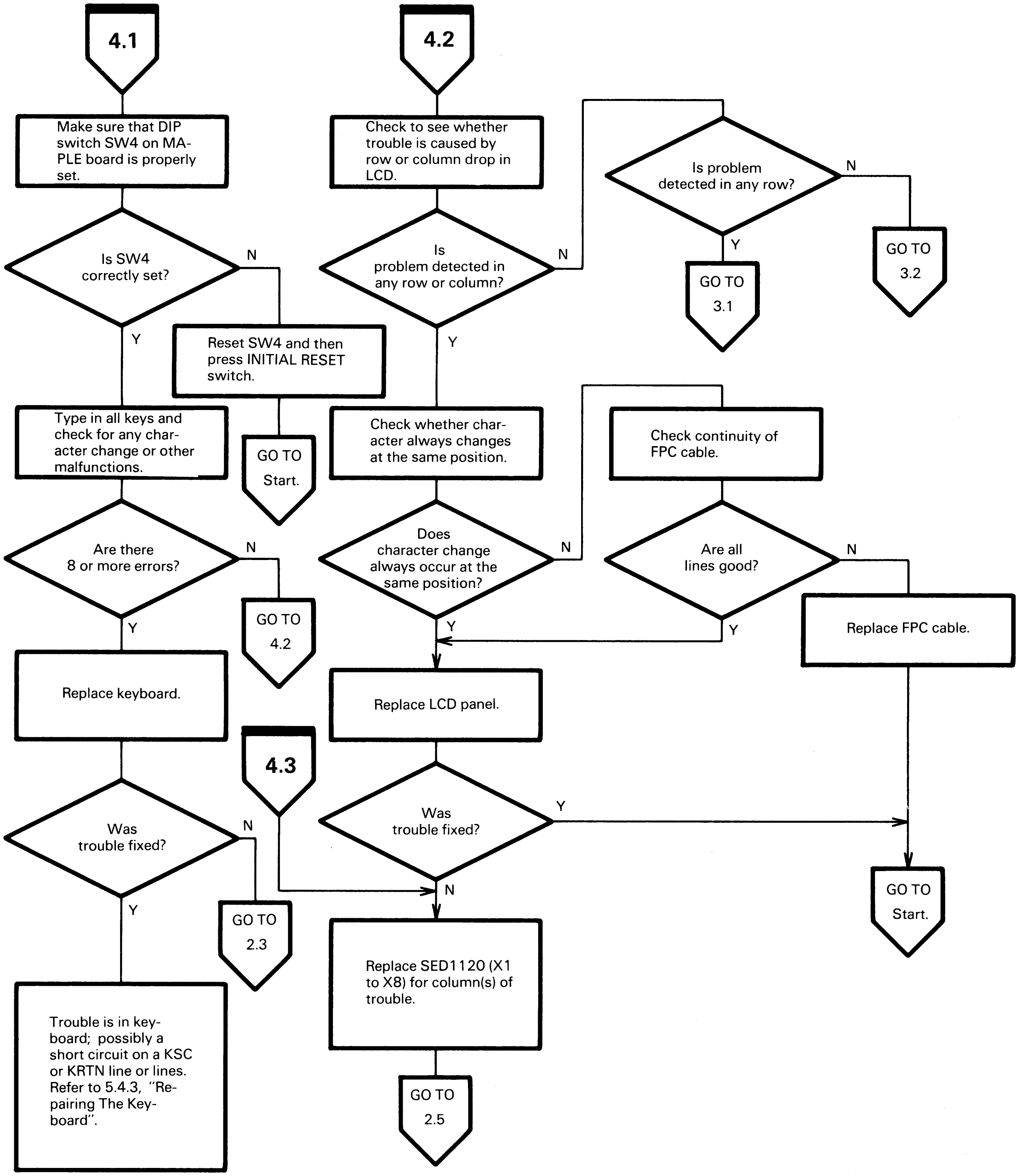
LCD UNIT REPAIR ENTRY TABLE

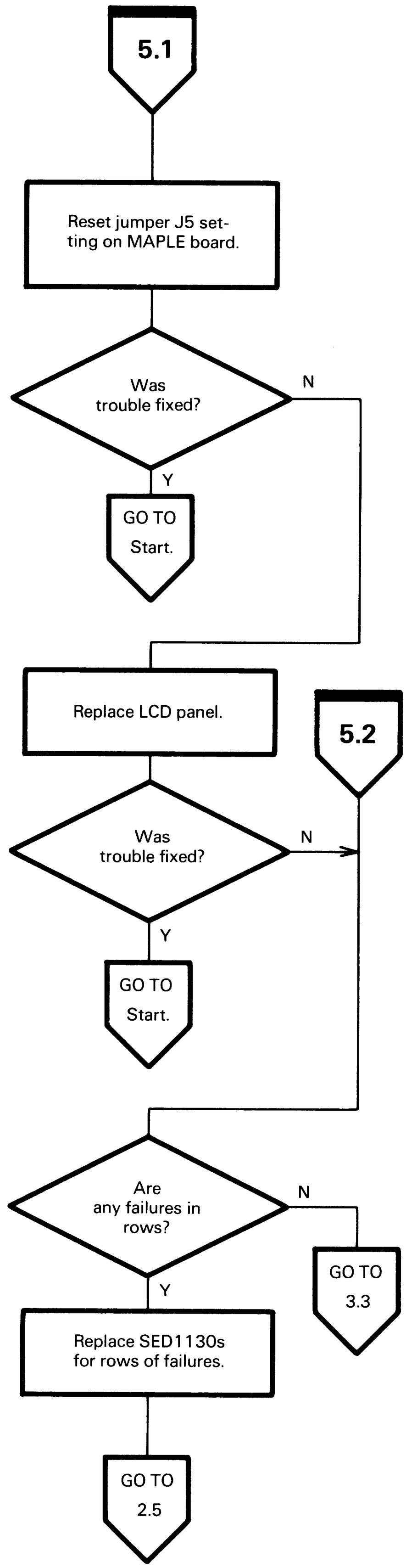





2.1
Adjust view angle variable resistor as viewing LCD panel.
Did something appear?
N
Y
GO TO 1.2
Check continuity between FPC cable end and soldering.
Was that check found good?
Y
N
Replace FPC cable.
GO TO Start.
2.2
Measure relative voltages from +5V of pins 66, 67, 68, 71, and 72 of SED1130 (Y1).
Are all voltages different?
Y
N
Measure resistances of resistors R1 through R3.
Are those resistances correct?
Y
N
Possibly a short circuit within LCD driver X1 to X8 or Y1.
GO TO 2.1
Measure maximum voltage between pins 66 and 74 of SED1320 as sliding view angle variable resistor VR1.
Is absolute voltage approximately 20V?
Y
N
GO TO 2.4
Check variable resistance range of variable resistor VR1.
Can VR1 vary from 1 ohm to 5 kohms?
Y
N
Replace VR1.
GO TO 2.1
GO TO 2.3
2.3
Replace LCD panel.
Was trouble fixed?
N
Y
Replace SED1130 in faulty LCD unit.
GO TO Start.
2.4
Possibly no trouble in LCD unit. Check connectors for any imperfect contacts and then replace LCD unit.
2.5
Was trouble fixed?
N
Y
Possibly a MAPLE board problem.


3.1
Disassemble LCD panel. Examine assembly of board, Zebra, and panel for any problem, and check for dirt. Clean dirt and/or readjust assembly if necessary.
Was trouble fixed?
Y
N
Replace SED1130.
Was trouble fixed?
Y
N
Check continuity of FPC cable signal lines between cable end and SED1130 pins.
Was trouble fixed?
Y
N
GO TO 2.2
GO TO Start.
3.2
Disassemble LCD panel. Examine assembly of board, Zebra, and panel for any problem, and check for dirt. Clean dirt and/or readjust assembly if necessary.
Was trouble fixed?
Y
GO TO Start.
N
Examine positions and number of rows and columns which are not displayed.
Are 32 or more columns missing?
Y
N
Replace SED1120s (X1 to X8) for missing columns.
Was trouble fixed?
Y
N
GO TO 2.3
GO TO Start
Check the output signal line of SET 1120 which has relation with illegal display function.
Is there pulsing output?
N
Y
Replace SED1120s to left of that for missing column.
Was trouble fixed?
Y
N
GO TO Start
3.3


4.1
Make sure that DIP switch SW4 on MAPLE board is properly set.
Is SW4 correctly set?
N
Reset SW4 and then press INITIAL RESET switch.
GO TO Start.
Y
Type in all keys and check for any character change or other malfunctions.
Are there 8 or more errors?
N
GO TO 4.2
Y
Replace keyboard.
Was trouble fixed?
N
GO TO 2.3
Y
Trouble is in keyboard; possibly a short circuit on a KSC or KRTN line or lines. Refer to 5.4.3, "Repairing The Keyboard".
4.2
Check to see whether trouble is caused by row or column drop in LCD.
Is problem detected in any row or column?
N
Is problem detected in any row?
Y
GO TO 3.1
N
GO TO 3.2
Y
Check whether character always changes at the same position.
Does character change always occur at the same position?
N
Check continuity of FPC cable.
Are all lines good?
N
Replace FPC cable.
Y
Y
Replace LCD panel.
4.3
Was trouble fixed?
Y
GO TO Start.
N
Replace SED1120 (X1 to X8) for column(s) of trouble.
GO TO 2.5


5.1
Reset jumper J5 setting on MAPLE board.
Was trouble fixed?
N
Y
GO TO Start.
Replace LCD panel.
5.2
Was trouble fixed?
N
Y
GO TO Start.
Are any failures in rows?
N
Y
GO TO 3.3
Replace SED1130s for rows of failures.
GO TO 2.5

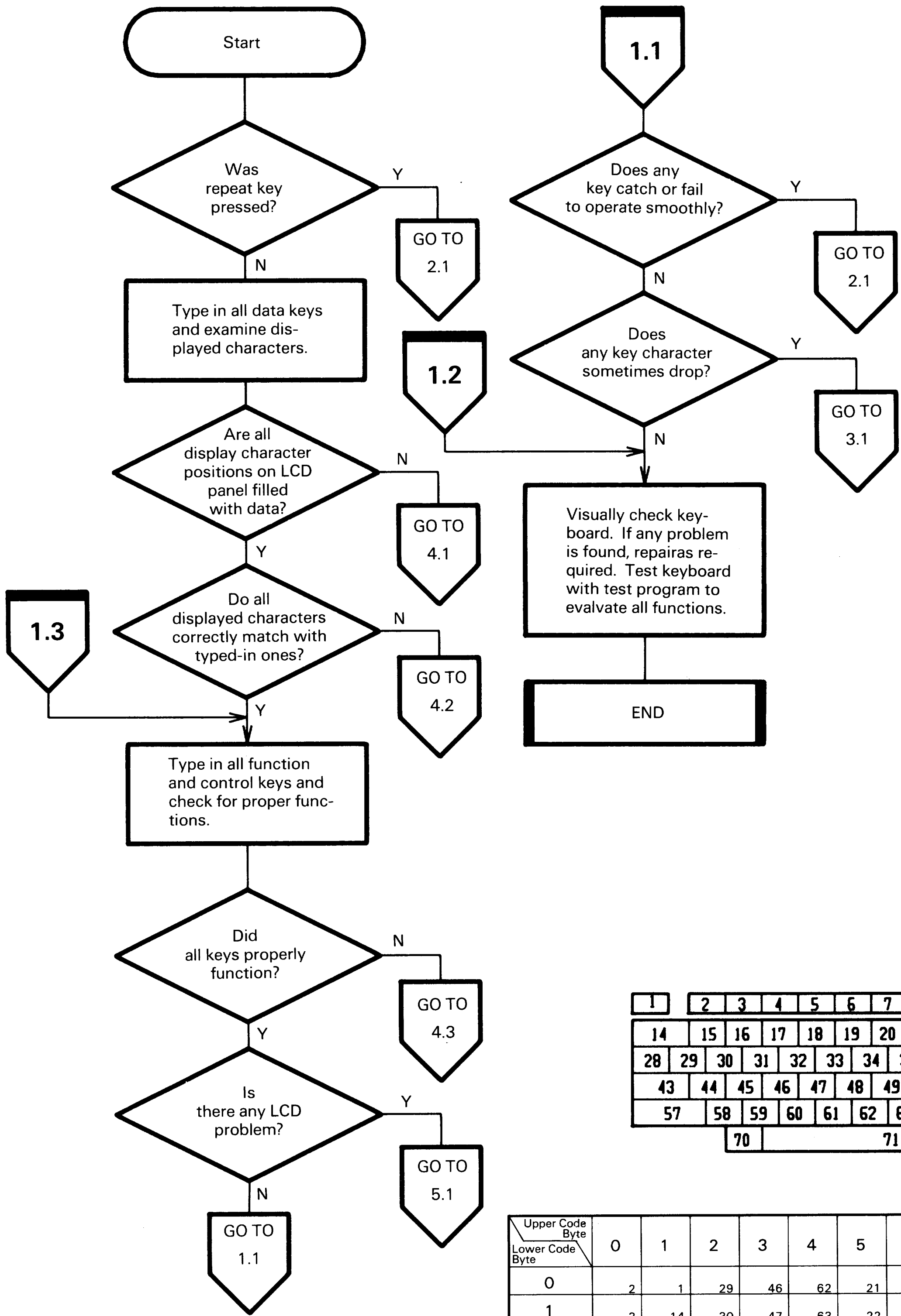
5.4.3 Repairing The Keyboard

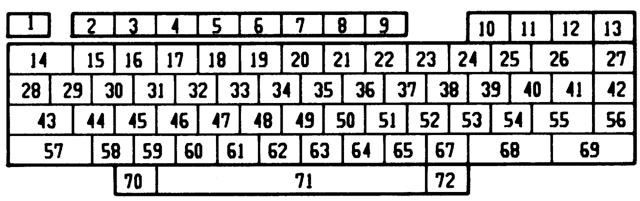
Before repairing the keyboard, perform the following checkes:

1) Visually check the keyboard circuit board for any damage.
2) Visually check the keyboard information cable connectors for any damage.
3) Visually check the keyboard's internal components such as the circuit board, FPC pattern, and switches, for any foreign matter such as water drops.
4) Visually check the circuit board for any FPC pattern separation.

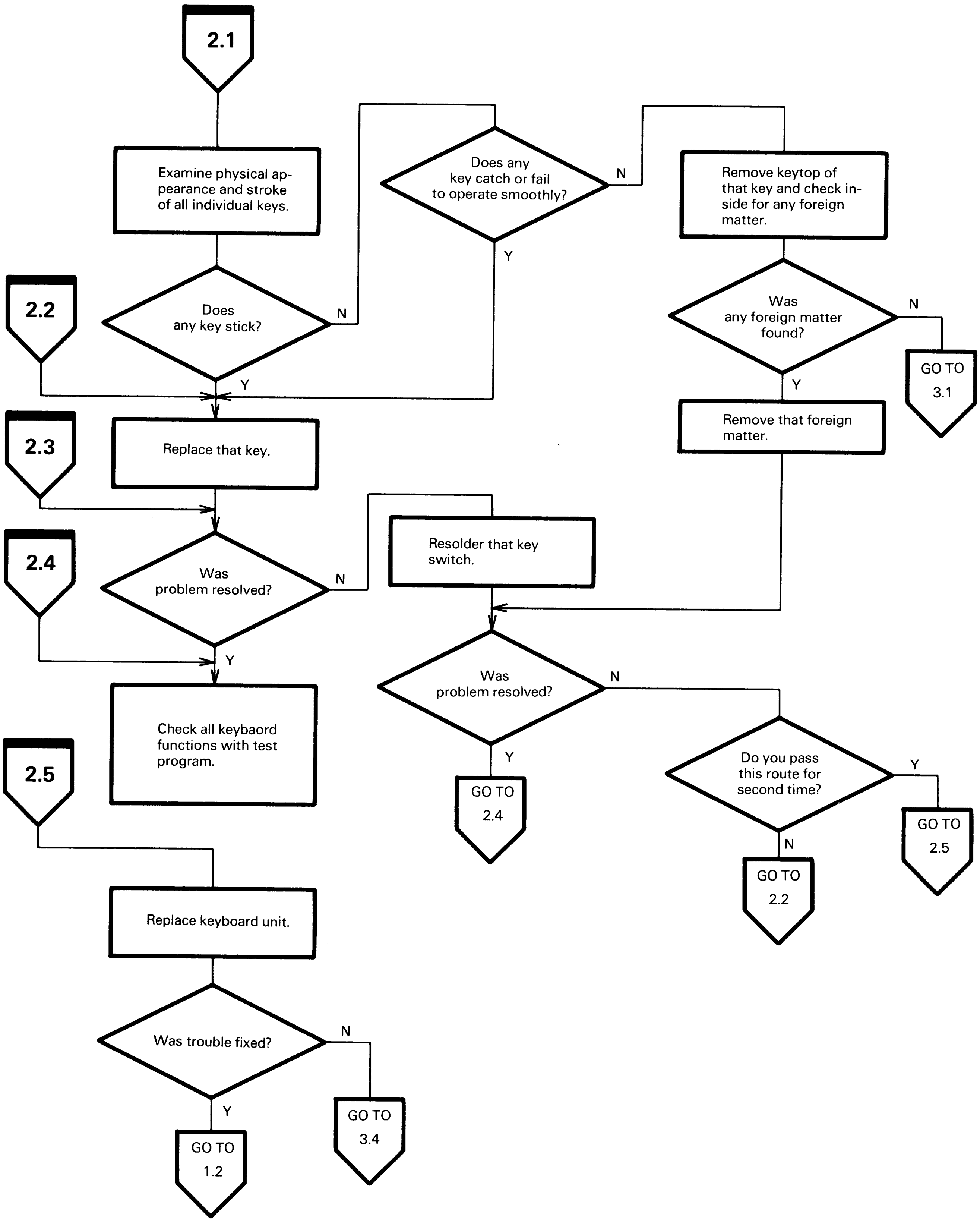
If damaged components which cannot be repaired are found in steps 1 or 2, replace the keyboard. If any foreign matter was found in check 3), clean and dry the components at the normal temperature. After components are dry, test the keyboard functions again.
If a problem still exists, replace the keyboard.
(Even if the trouble disappears, it is possible that it may reoccur at another time due to oxidation of the circuit board patterns. If this occurs the keyboard may have to be replaced.
Printed circuit pattern separations may be fixed by a combination of a hot press and adhesive. If unrepairable, replace the unit.

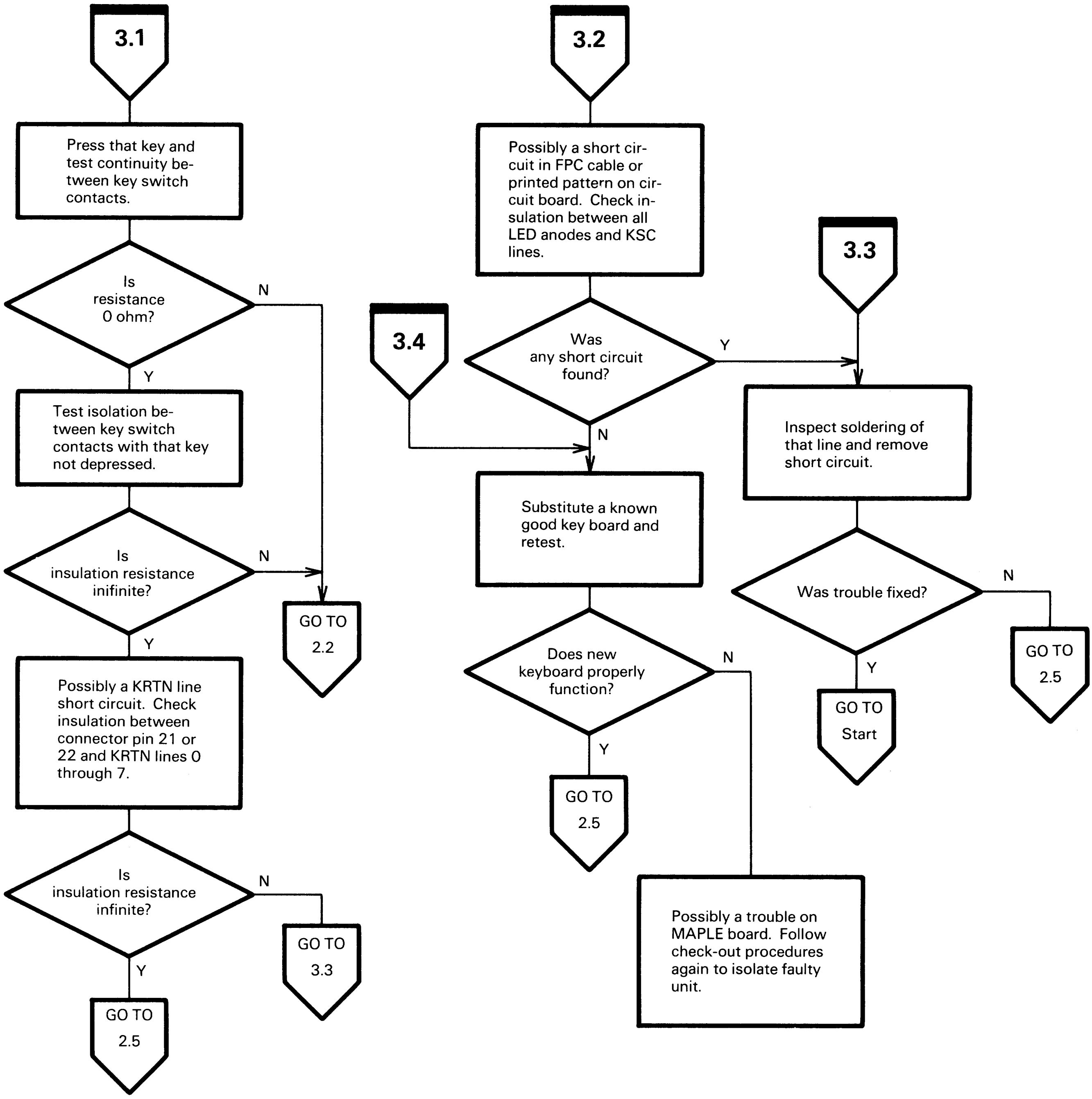
KEYBOARD UNIT REPAIR ENTRY TABLE

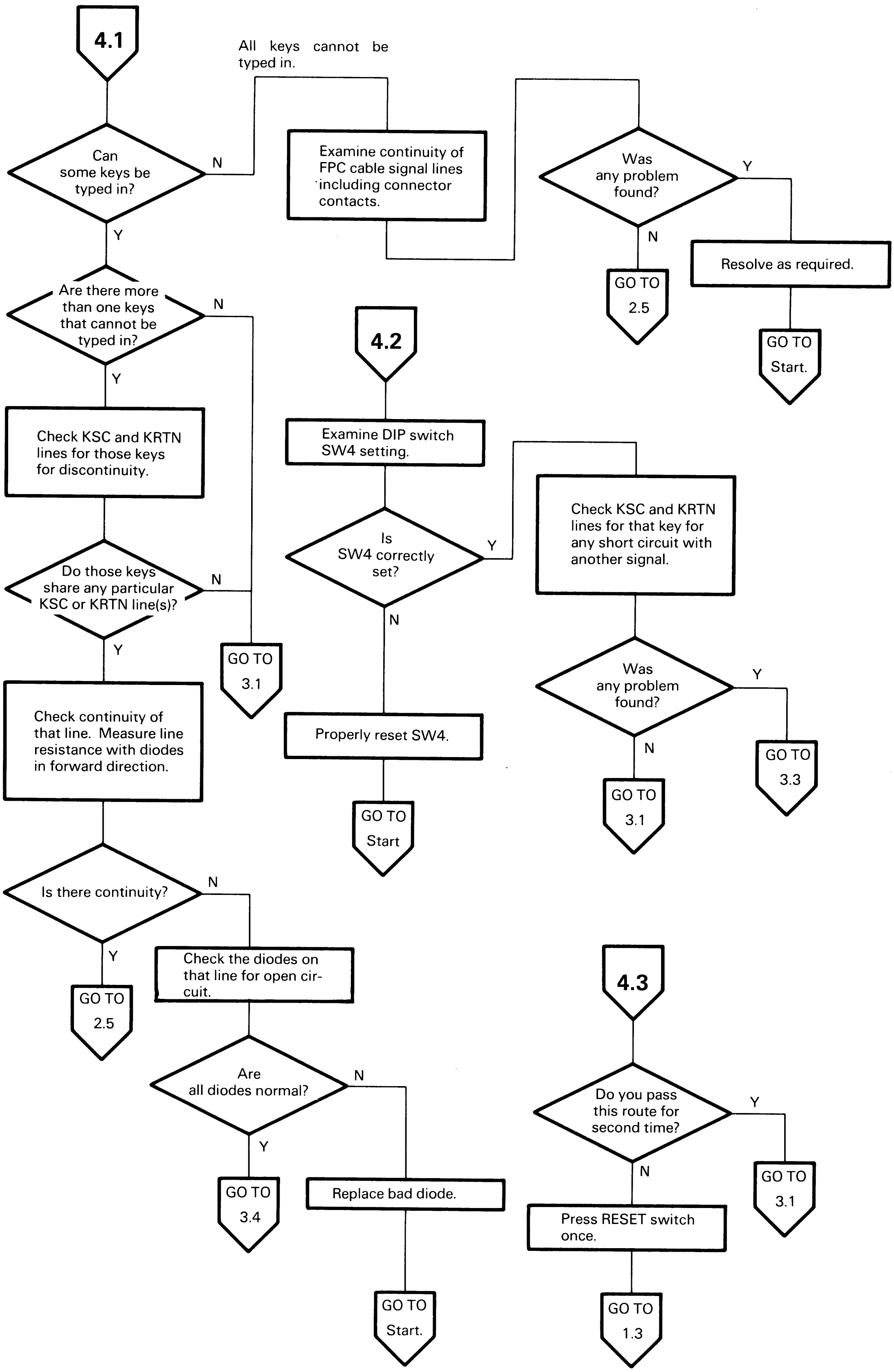


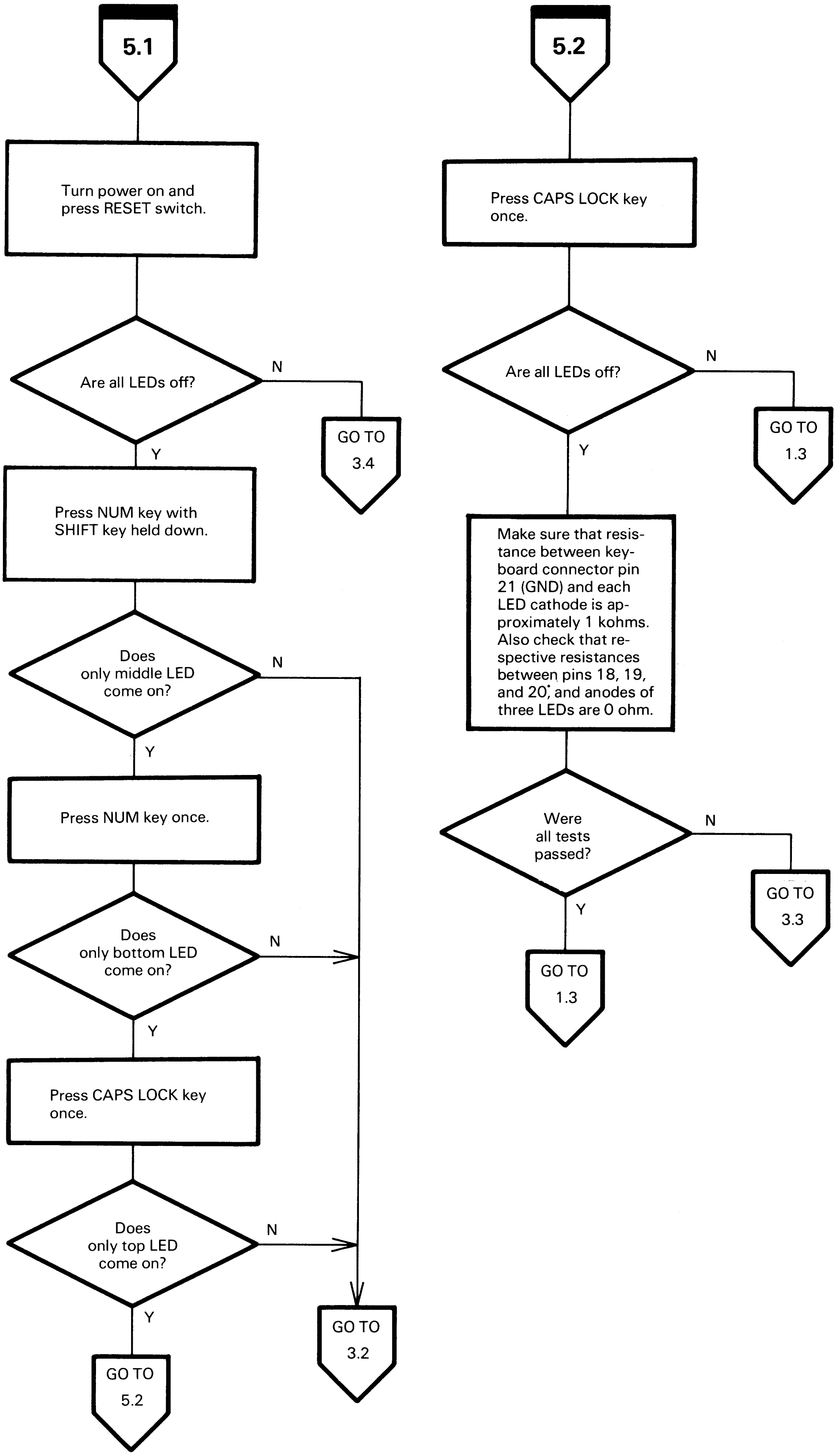


Upper Code Byte / Lower Code Byte	0	1	2	3	4	5	6	7	8	9	A	B
0	2	1	29	46	62	21	37	54	12			
1	3	14	30	47	63	22	38	55	13			
2	4	15	31	48	64	23	39	56			OFF 43	ON 43
3	5	16	32	49	65	24	40	71			OFF 57	ON 57
4	6	17	33	50	66	25	41	58			OFF 70	ON 70
5	7	18	34	51	67	26	42	59			OFF 72	ON 72
6	8	19	35	52	10	27	44	60			OFF 68	ON 68
7	9	20	36	53	11	28	45	61			OFF 69	ON 69
8												
9												


2.1
Examine physical appearance and stroke of all individual keys.
Does any key stick?
N
Y
Does any key catch or fail to operate smoothly?
N
Y
Remove keytop of that key and check inside for any foreign matter.
Was any foreign matter found?
N
GO TO 3.1
Y
Remove that foreign matter.
2.2
2.3
Replace that key.
2.4
Was problem resolved?
N
Y
Resolder that key switch.
Was problem resolved?
N
Y
GO TO 2.4
Do you pass this route for second time?
Y
GO TO 2.5
N
GO TO 2.2
Check all keybaord functions with test program.
2.5
Replace keyboard unit.
Was trouble fixed?
N
GO TO 3.4
Y
GO TO 1.2


3.1
Press that key and test continuity between key switch contacts.
Is resistance 0 ohm?
N
Y
Test isolation between key switch contacts with that key not depressed.
Is insulation resistance inifinite?
N
Y
GO TO 2.2
Possibly a KRTN line short circuit. Check insulation between connector pin 21 or 22 and KRTN lines 0 through 7.
Is insulation resistance infinite?
N
Y
GO TO 3.3
GO TO 2.5
3.2
Possibly a short circuit in FPC cable or printed pattern on circuit board. Check insulation between all LED anodes and KSC lines.
3.4
Was any short circuit found?
Y
N
Substitute a known good key board and retest.
Does new keyboard properly function?
N
Y
GO TO 2.5
Possibly a trouble on MAPLE board. Follow check-out procedures again to isolate faulty unit.
3.3
Inspect soldering of that line and remove short circuit.
Was trouble fixed?
N
Y
GO TO 2.5
GO TO Start


4.1
Can some keys be typed in?
N
All keys cannot be typed in.
Examine continuity of FPC cable signal lines including connector contacts.
Was any problem found?
Y
Resolve as required.
GO TO Start.
N
GO TO 2.5
Y
Are there more than one keys that cannot be typed in?
N
Y
Check KSC and KRTN lines for those keys for discontinuity.
Do those keys share any particular KSC or KRTN line(s)?
N
GO TO 3.1
Y
Check continuity of that line. Measure line resistance with diodes in forward direction.
Is there continuity?
Y
GO TO 2.5
N
Check the diodes on that line for open circuit.
Are all diodes normal?
Y
GO TO 3.4
N
Replace bad diode.
GO TO Start.
4.2
Examine DIP switch SW4 setting.
Is SW4 correctly set?
N
Properly reset SW4.
GO TO Start
Y
Check KSC and KRTN lines for that key for any short circuit with another signal.
Was any problem found?
N
GO TO 3.1
Y
GO TO 3.3
4.3
Do you pass this route for second time?
N
Press RESET switch once.
GO TO 1.3
Y
GO TO 3.1


5.1
Turn power on and press RESET switch.
Are all LEDs off?
N
GO TO 3.4
Y
Press NUM key with SHIFT key held down.
Does only middle LED come on?
N
Y
Press NUM key once.
Does only bottom LED come on?
N
Y
Press CAPS LOCK key once.
Does only top LED come on?
N
Y
GO TO 5.2
GO TO 3.2
5.2
Press CAPS LOCK key once.
Are all LEDs off?
N
GO TO 1.3
Y
Make sure that resistance between keyboard connector pin 21 (GND) and each LED cathode is approximately 1 kohms. Also check that respective resistances between pins 18, 19, and 20, and anodes of three LEDs are 0 ohm.
Were all tests passed?
N
GO TO 3.3
Y
GO TO 1.3

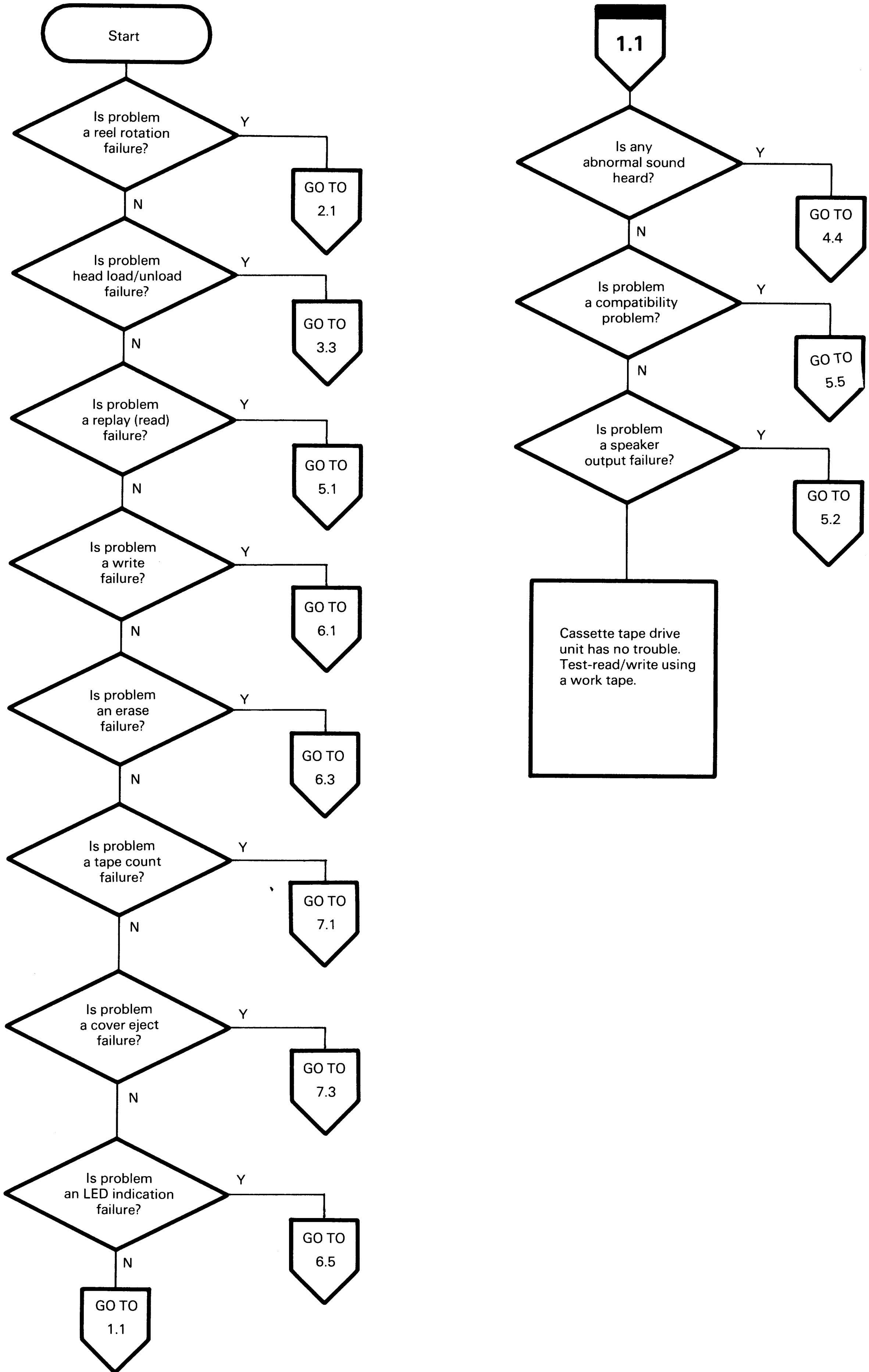
5.4.4 Repairing The Microcassette Tape Drive Unit

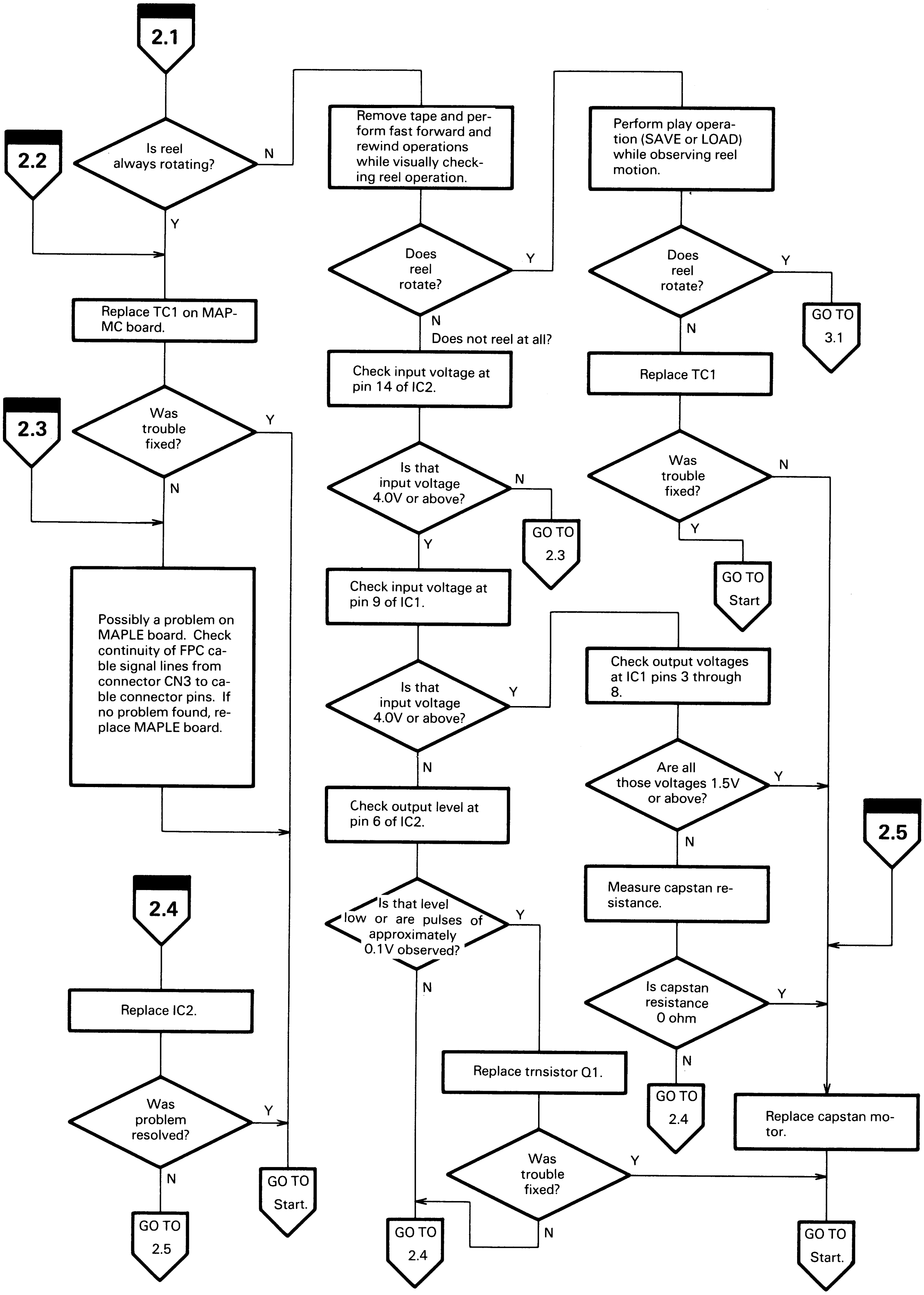
Before repairing the microcassette tape drive unit, check the following:

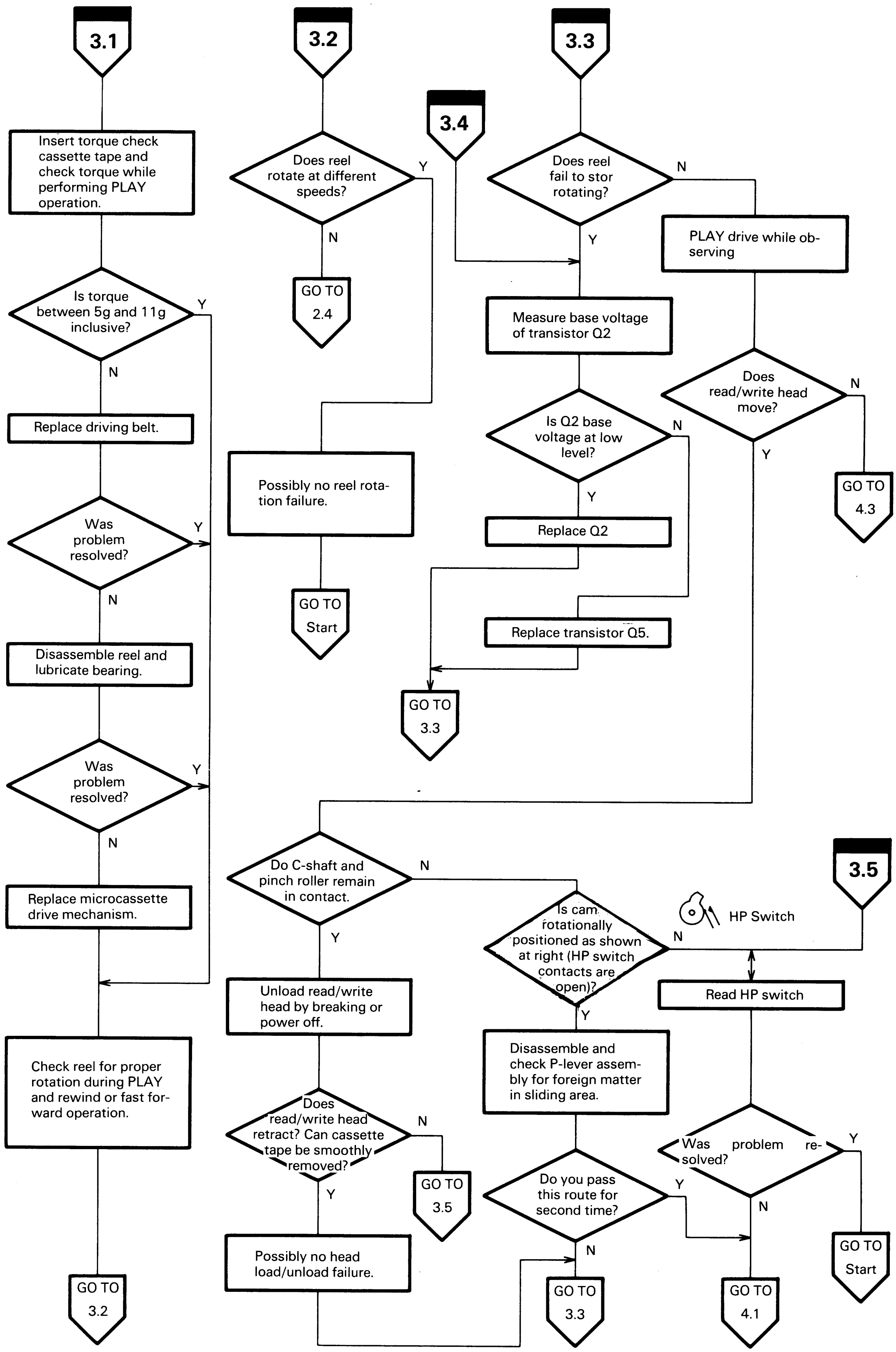
1) Check the read/write and pinch roller for dirts.
2) Exchange the microcassette tape for known good one and test to make sure malfunction is not due to a damaged tape.
3) Make sure that the lead wires from the mechanical section are perfectly soldered.
4) Examine the error message on the LCD panel to find whether the trouble is a directory-related problem. Tapes written by other computers may contain no directory and cannot be read by this computer.

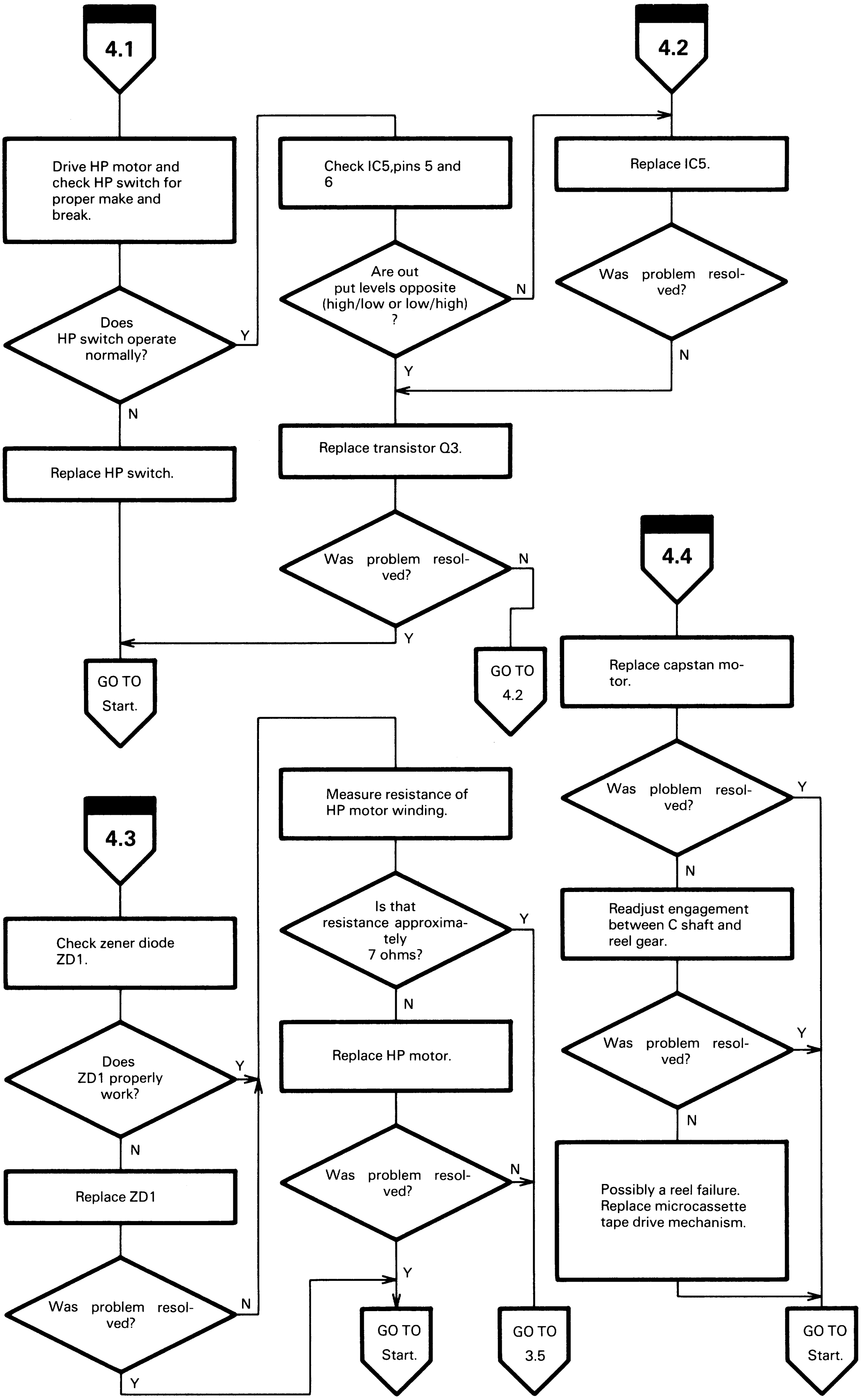
Problems 1) and 2), above, are interrelated so that both the checks should be performed at the same time.

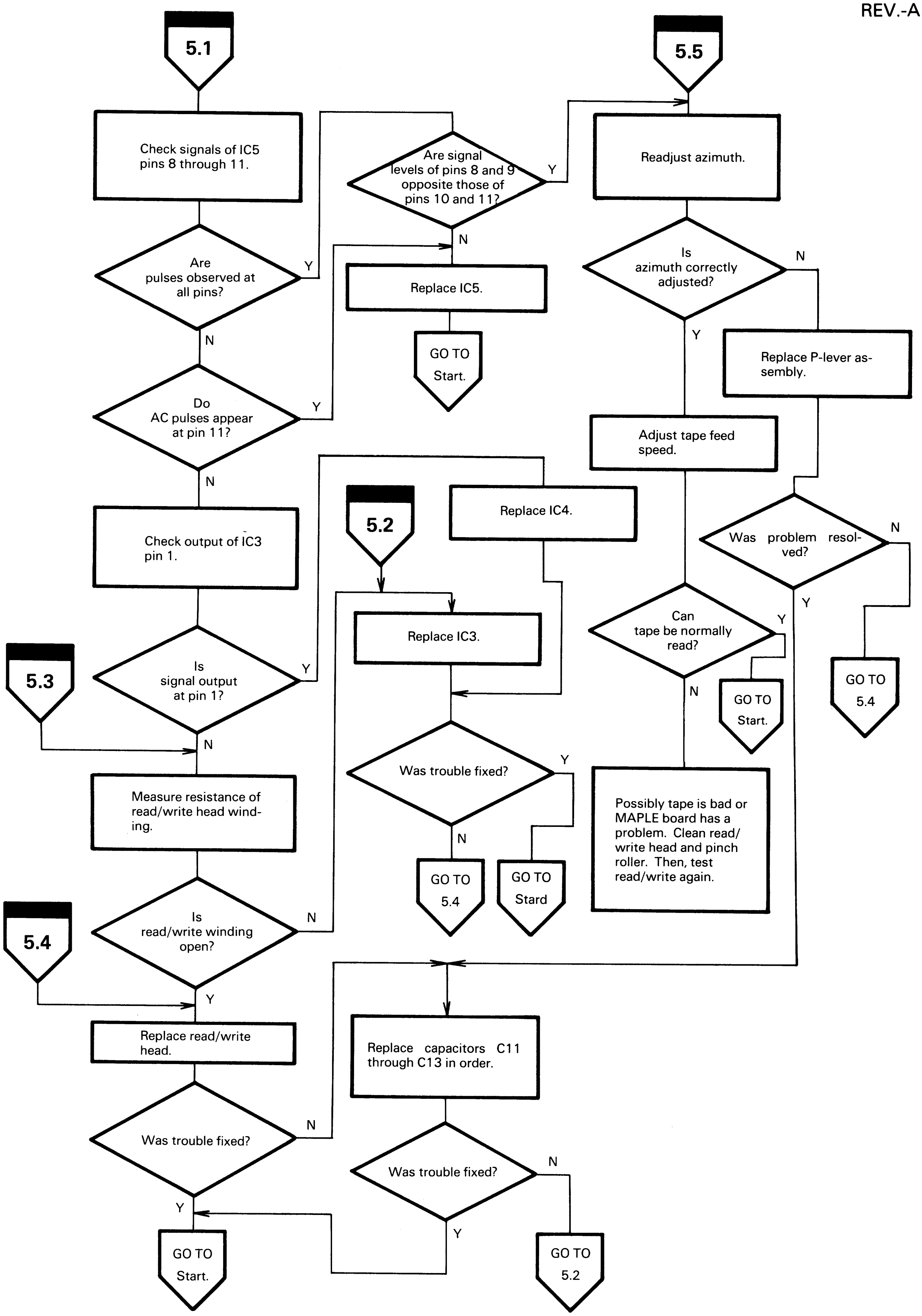
MICRO CASSETTE UNIT REPAIR ENTRY TABLE

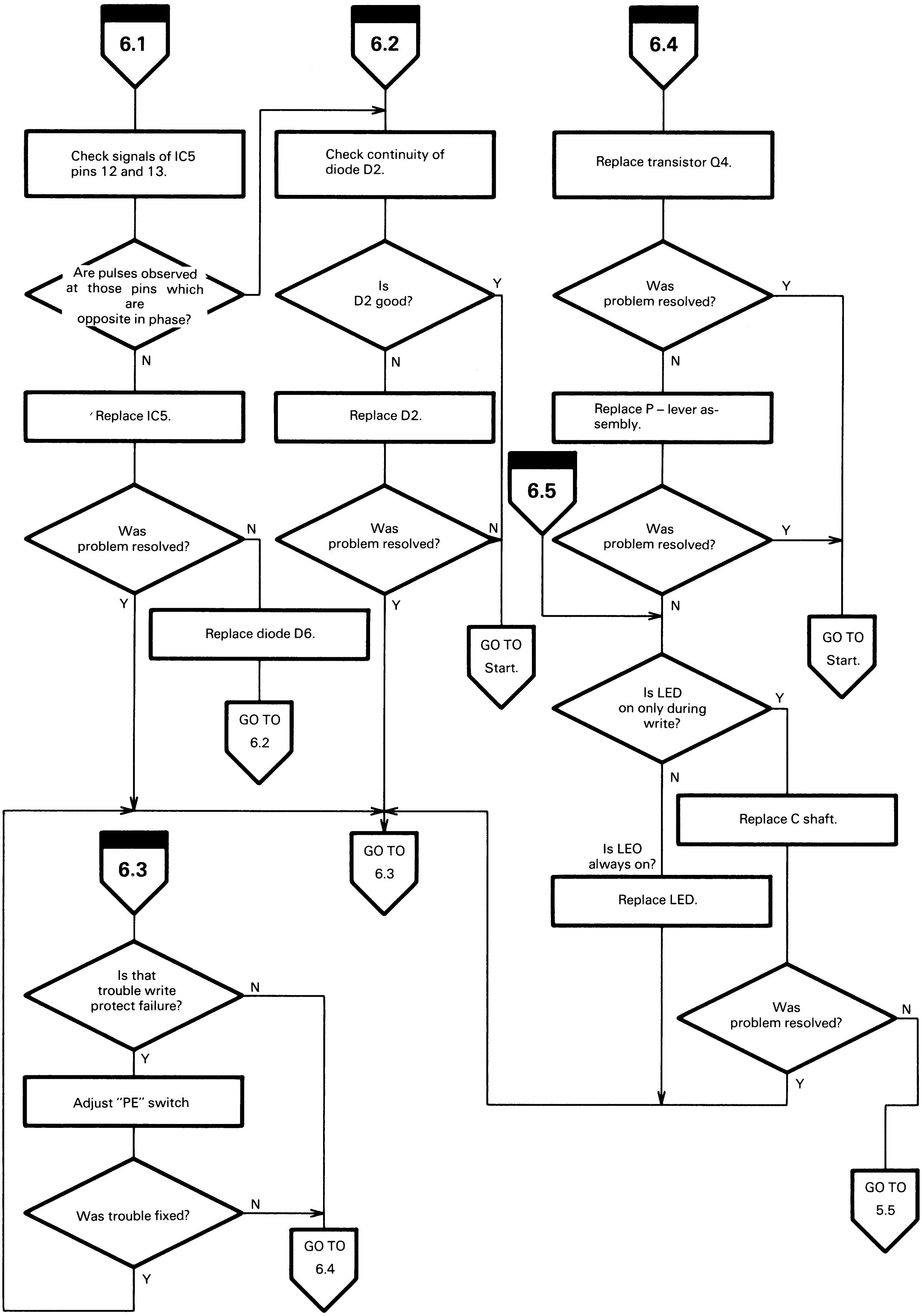


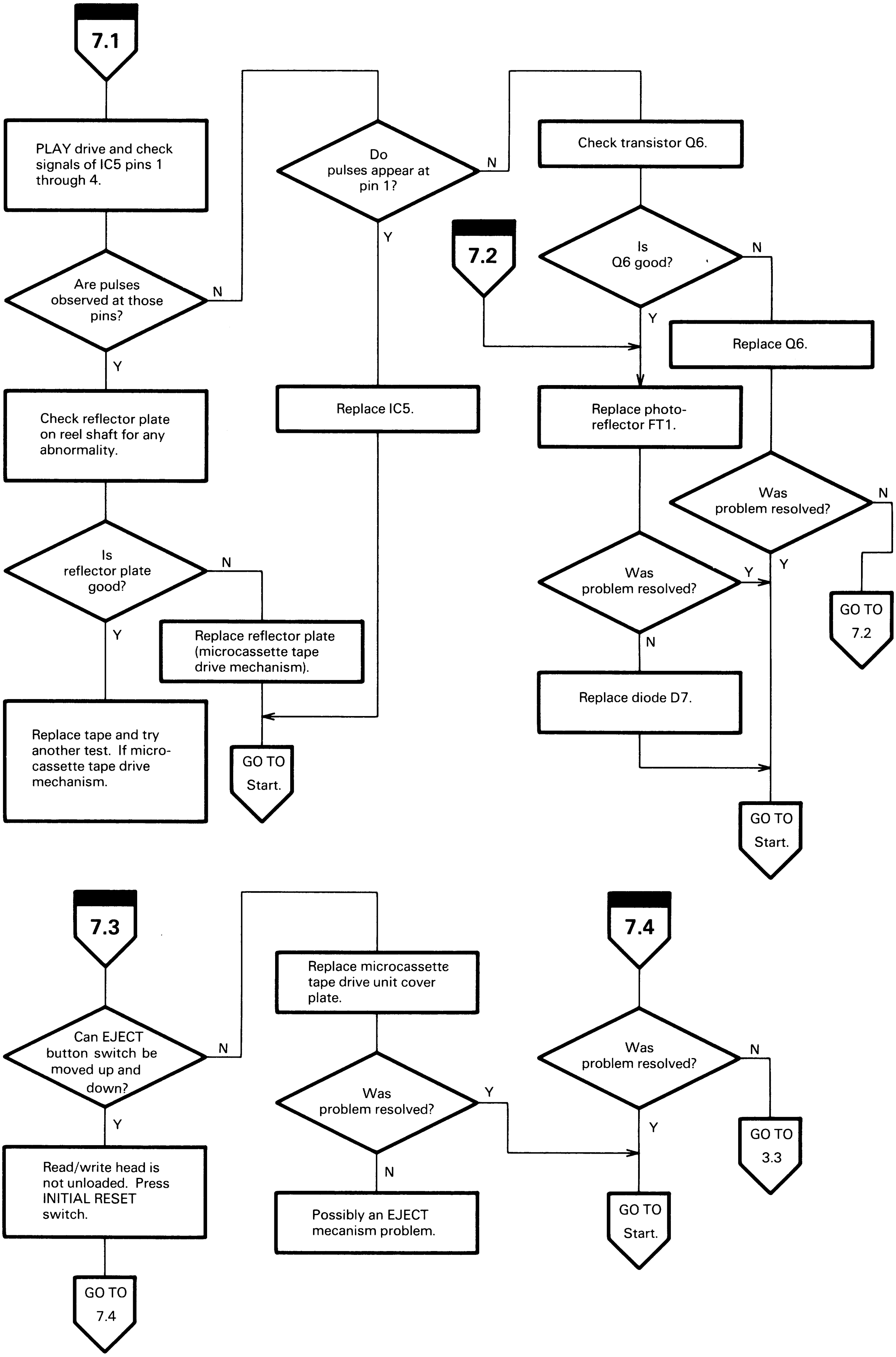

2.1
Is reel always rotating?
N
Y
2.2
Replace TC1 on MAP-MC board.
2.3
Was trouble fixed?
Y
N
Possibly a problem on MAPLE board. Check continuity of FPC cable signal lines from connector CN3 to cable connector pins. If no problem found, replace MAPLE board.
2.4
Replace IC2.
Was problem resolved?
Y
N
GO TO 2.5
GO TO Start.
Remove tape and perform fast forward and rewind operations while visually checking reel operation.
Does reel rotate?
Y
N
Does not reel at all?
Check input voltage at pin 14 of IC2.
Is that input voltage 4.0V or above?
N
GO TO 2.3
Y
Check input voltage at pin 9 of IC1.
Is that input voltage 4.0V or above?
Y
N
Check output level at pin 6 of IC2.
Is that level low or are pulses of approximately 0.1V observed?
Y
N
Replace trnsistor Q1.
Was trouble fixed?
Y
N
GO TO 2.4
Perform play operation (SAVE or LOAD) while observing reel motion.
Does reel rotate?
Y
GO TO 3.1
N
Replace TC1
Was trouble fixed?
N
Y
GO TO Start
Check output voltages at IC1 pins 3 through 8.
Are all those voltages 1.5V or above?
Y
N
Measure capstan resistance.
Is capstan resistance 0 ohm
Y
N
GO TO 2.4
2.5
Replace capstan motor.
GO TO Start.


3.1
Insert torque check cassette tape and check torque while performing PLAY operation.
Is torque between 5g and 11g inclusive?
Y
N
Replace driving belt.
Was problem resolved?
Y
N
Disassemble reel and lubricate bearing.
Was problem resolved?
Y
N
Replace microcassette drive mechanism.
Check reel for proper rotation during PLAY and rewind or fast forward operation.
GO TO 3.2
3.2
Does reel rotate at different speeds?
Y
N
GO TO 2.4
Possibly no reel rotation failure.
GO TO Start
3.4
3.3
Does reel fail to stor rotating?
N
Y
PLAY drive while observing
Measure base voltage of transistor Q2
Is Q2 base voltage at low level?
N
Y
Replace Q2
Replace transistor Q5.
GO TO 3.3
Does read/write head move?
N
Y
GO TO 4.3
Do C-shaft and pinch roller remain in contact.
N
Y
Unload read/write head by breaking or power off.
Does read/write head retract? Can cassette tape be smoothly removed?
N
Y
GO TO 3.5
Possibly no head load/unload failure.
Is cam rotationally positioned as shown at right (HP switch contacts are open)?
N
Y
HP Switch
3.5
Read HP switch
Disassemble and check P-lever assembly for foreign matter in sliding area.
Do you pass this route for second time?
Y
N
GO TO 3.3
Was problem resolved?
Y
N
GO TO 4.1
GO TO Start


4.1
Drive HP motor and check HP switch for proper make and break.
Does HP switch operate normally?
Y
N
Replace HP switch.
GO TO Start.
Check IC5,pins 5 and 6
Are out put levels opposite (high/low or low/high) ?
N
Y
Replace transistor Q3.
Was problem resolved?
N
Y
GO TO 4.2
4.2
Replace IC5.
Was problem resolved?
N
4.4
Replace capstan motor.
Was ploblem resolved?
Y
N
Readjust engagement between C shaft and reel gear.
Was problem resolved?
Y
N
Possibly a reel failure. Replace microcassette tape drive mechanism.
GO TO Start.
4.3
Check zener diode ZD1.
Does ZD1 properly work?
Y
N
Replace ZD1
Was problem resolved?
N
Y
Measure resistance of HP motor winding.
Is that resistance approximately 7 ohms?
Y
N
Replace HP motor.
Was problem resolved?
N
Y
GO TO Start.
GO TO 3.5


5.1
Check signals of IC5 pins 8 through 11.
Are pulses observed at all pins?
Y
N
Are signal levels of pins 8 and 9 opposite those of pins 10 and 11?
Y
N
Replace IC5.
GO TO Start.
Do AC pulses appear at pin 11?
Y
N
Check output of IC3 pin 1.
Is signal output at pin 1?
Y
N
Replace IC4.
5.2
Replace IC3.
Was trouble fixed?
Y
N
GO TO 5.4
GO TO Stard
5.3
Measure resistance of read/write head winding.
Is read/write winding open?
N
Y
5.4
Replace read/write head.
Was trouble fixed?
N
Y
GO TO Start.
Replace capacitors C11 through C13 in order.
Was trouble fixed?
N
Y
GO TO 5.2
5.5
Readjust azimuth.
Is azimuth correctly adjusted?
N
Y
Replace P-lever assembly.
Adjust tape feed speed.
Was problem resolved?
N
Y
GO TO 5.4
Can tape be normally read?
Y
N
GO TO Start.
Possibly tape is bad or MAPLE board has a problem. Clean read/write head and pinch roller. Then, test read/write again.

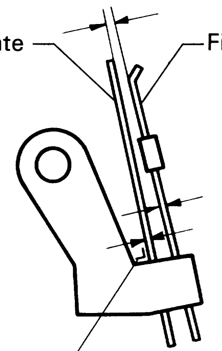

6.1
Check signals of IC5 pins 12 and 13.
Are pulses observed at those pins which are opposite in phase?
N
Replace IC5.
Was problem resolved?
N
Y
Replace diode D6.
GO TO 6.2
6.2
Check continuity of diode D2.
Is D2 good?
Y
N
Replace D2.
Was problem resolved?
N
Y
GO TO Start.
GO TO 6.3
6.3
Is that trouble write protect failure?
N
Y
Adjust "PE" switch
Was trouble fixed?
N
Y
GO TO 6.4
6.4
Replace transistor Q4.
Was problem resolved?
Y
N
Replace P – lever assembly.
6.5
Was problem resolved?
Y
N
GO TO Start.
Is LED on only during write?
Y
N
Replace C shaft.
Is LEO always on?
Replace LED.
Was problem resolved?
N
Y
GO TO 5.5


7.1
PLAY drive and check signals of IC5 pins 1 through 4.
Are pulses observed at those pins?
N
Y
Check reflector plate on reel shaft for any abnormality.
Is reflector plate good?
N
Y
Replace reflector plate (microcassette tape drive mechanism).
Replace tape and try another test. If micro-cassette tape drive mechanism.
Do pulses appear at pin 1?
N
Y
Replace IC5.
GO TO Start.
Check transistor Q6.
7.2
Is Q6 good?
N
Y
Replace Q6.
Replace photo-reflector FT1.
Was problem resolved?
N
Y
GO TO 7.2
Was problem resolved?
Y
N
Replace diode D7.
GO TO Start.
7.3
Can EJECT button switch be moved up and down?
N
Y
Read/write head is not unloaded. Press INITIAL RESET switch.
GO TO 7.4
Replace microcassette tape drive unit cover plate.
Was problem resolved?
Y
N
Possibly an EJECT mecanism problem.
7.4
Was problem resolved?
N
Y
GO TO 3.3
GO TO Start.

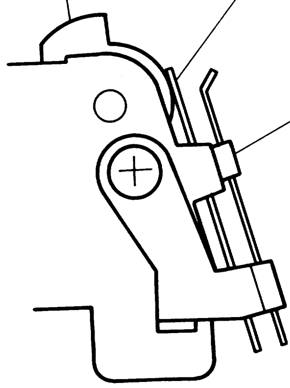
How to adjust the HP switch

Before mounted

1. Nominal separation: approximately twice the fixed spring plate thickness – 0.35 ± 0.1 (Unit: mm)

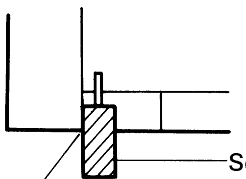


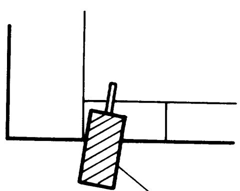
After mounted

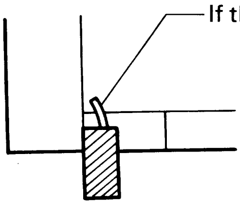


How to adjust the PE switch

(1) Mounting position



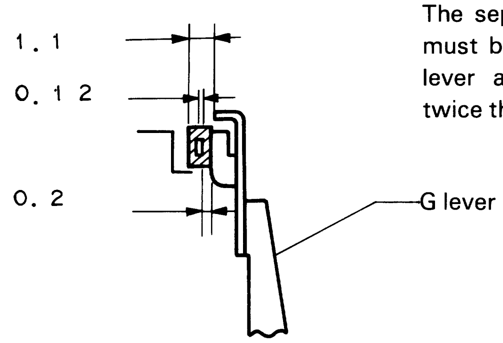




(2) Inspection

(a) When a MIN cassette tape is inserted.

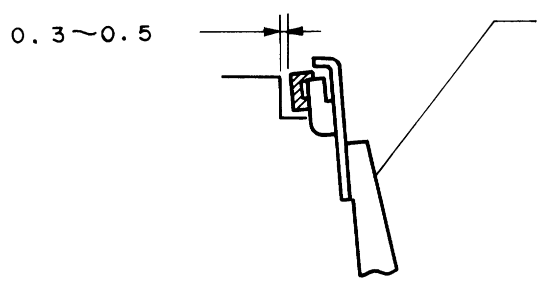
(Unit: mm)



The separator must rest on the base plate and there must be a separation of 0.2 or more between the G lever and the switch contact plate (approximately twice the switch contact plate thickness which is 0.12.)

(b) When a rug-bent cassette tape is inserted.

(Unit: mm)



The separation between the separator and base plate must be from 0.3 to 0.5 (approximately half or one third of the separator thickness.)