

1. Specification

1-1 General

Frequency Range	
Transmitter	: 1850 ~ 1910 MHz
Receiver	: 1930 ~ 1990 MHz
Channel Bandwidth	: CDMA 1.25MHz
Channel Spacing	: 50 KHz
Number of Channels	: 1200
Duplex Separation	: 80 MHz
Type of Emission	: G7 W
Input/Output Impedance	: 50 ohms
Intermediate Frequency	
Transmitter	: 130.38 MHz
Receiver	: 210.38 MHz
Local Frequency	
Transmitter	: 1st (FTX-130.38), 2nd (260.76 MHz)
Receiver	: 1st (FRX-210.38), 2nd (420.76 MHz)
TCXO Frequency	: 19.68 MHz
Frequency Stability	: (FRX - 80 MHz) \pm 150 Hz
Operating Temperature	: -20 $^{\circ}$ C ~ +50 $^{\circ}$ C
Supply Voltage	: 11V nominal @0.8~0.9A / 90~270V AC / 45~70Hz
Current Consumption (Average)	
Standby	: 30 mA (Non-slot mode)
Talk	: 400 mA (at +10 dBm)
Size and Weight	: 218 \times 210 \times 73mm 1183g

1-2 Transmitter

Waveform Quality	: 0.944 or more
Open Loop Power Control Range	
-25 dBm	: -60.5 dBm ~ -41.5 dBm
-65 dBm	: -20.5 dBm ~ -1.5 dBm
-104dBm	: +15.0 dBm ~ +30.0 dBm
Minimum Tx Power Control	: -50 dBm below
Closed Loop Power Control Range	: ± 24 dB
Maximum RF Output Power	: 200 mW (+23 dBm)
Occupied Bandwidth	: 1.23 MHz
Conducted Spurious Emissions @1.25MHz	: -42 dBc/30KHz

1-3 Receiver

Rx Sensitivity and Dynamic Range (Rate Set 1)	: -104 dBm, FER=0.5% or less : -25 dBm, FER=0.5% or less
Conducted Spurious Emission	
1930 ~ 1990 MHz	: <-81 dBm
1850 ~ 1910 MHz	: <-61 dBm
All Other Frequencies	: <-47 dBm
Single Tone Desensitization	: lower than 1%
Rx power=-101 dBm	
Tone power=-30 dBm	
Tone offset from carrier= ± 1.25 MHz	
Intermodulation Spurious Response Attenuation	: lower than 1%
Rx power=-101 dBm	
Tone power 1=-43 dBm	
Tone power 2=-43 dBm	
Tone 1 offset from carrier= ± 1.25 MHz	
Tone 2 offset from carrier= ± 2.05 MHz	

2. Nam Programming

2. NAM Programming

NAM features can be programmed as follows:

Notes:

- If you enter the NAM program mode, each item shows the currently stored data. Go to the next item by pressing **STO**.
- You can modify the data by entering a new data.
- If you enter a wrong digit, press **CLR** to delete the last digit. Press and hold **CLR** to delete all digits.
- To scroll items backwards or forwards, press the **VOLUME** button on the phone.

2-1 General Setup

LCD Display	Key in	Function
	MENU, 5, 0	-selects NAM programming
Enter Lock ???????	6-digit code	-Enter random 6-digit code (MSL)
SVC Menu ↑ ↓ 1:PCS Phone# 2:General	2	-choose 'GENERAL.'
ESN B0000000	Volume ▲	-Electronic Serial Number of the phone is displayed
CAI version 1	Volume ▲	-Common Air Interface version is displayed
VOC13K/8K SO_VOICE_13K	↑ or ↓ STO	-Select vocoder service option -stores it
SCM 00001010	Volume ▲	-Station Class Mark displays the power class, transmission, slotted class, dual mode.
Lock Code 0000	4-digit code STO	Lock code, current status is displayed -to change, enter new code. -stores it.
Slot Mode No	↑ or ↓ STO	Slot mode. 'Yes' indicates the slot mode. -changes the status. -stores it.
Slot Index 2	0 - 7 STO	Slot mode index. The higher, the longer sleeping time. -to change, enter new one. -stores it.

2-2 Setting Up NAM

LCD Display	Key in	Function
SVC Menu ↑ ↓ 1:PCS Phone # 2:General	Volume ▲	-NAM Programming Menu is displayed
SVC Menu ↑ ↓ 3:NAM	3	-choose 'Setup NAM'
IMSI_MCC 310	number STO	IMSI Mobile Country Code, current code is displayed. -to change, enter new one. -stores it.
IMSI_MNC 00	number STO	IMSI Mobile Network Code, current code is displayed. -to change, enter new one. -stores it.
CDMA ACCOLC 0	class number STO	CDMA Access Over load Class, current status is displayed. -to change, enter new one. -stores it.
CDMA HomeSID Yes	↑ or ↓ STO	CDMA Home system ID, current status is displayed. -changes the status. -stores it.
CDMA fSID Yes	↑ or ↓ STO	CDMA foreign SID, current status is displayed. -changes the status. -stores it.
CDMA fNID Yes	↑ or ↓ STO	CDMA foreign NID, current status is displayed. -changes the system. -stores it.
SID 4120	number STO	first SID written in the list, current status is displayed. -to change, enter new one. -stores it.
NID 65535	number STO	first NID written in the list, current status is displayed. -to change, enter new one. -stores it.

4. Test Procedure

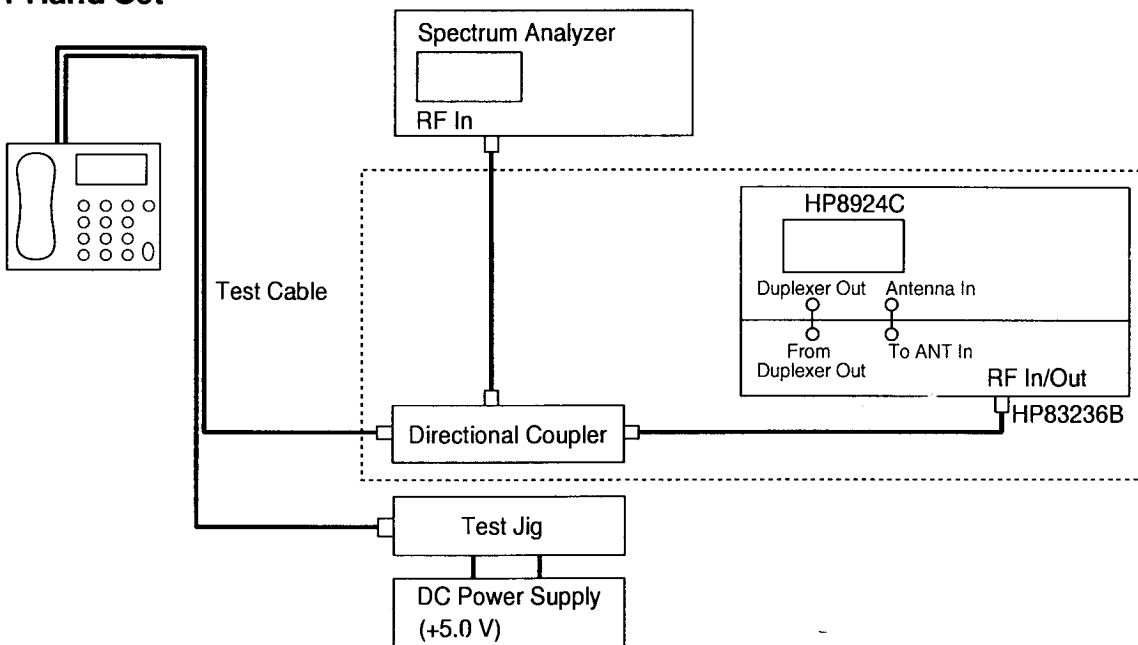
4. Test Procedure

4-1 List of Equipment

- DC Power Supply
- Test Jig
- Test Cable
- CDMA Mobile Station Test Set HP8924C, HP83236B, CMD-80, etc
- Spectrum Analyzer (include CDMA test mode) HP8596E

4-2 Configuration of Test

4-2-1 Hand Set



4-3 Test Procedure

4-3-1 Change to Test Mode

1. To change the phone from Normal Mode to test Mode, You should enter the following keys.
" 4 7 * 8 6 9 # 1 2 3 5 "
2. The command "0 1"(Suspend) is entered to start test.
3. To finish the Test Mode, You should enter the command "0 2".

4-3-2 Channel Selection and Tx Power Output level Control

1. You should change the phone from Normal Mode to Test mode
2. The command "0 1"(Suspend) is entered to start test.

3. You should enter the following keys.
" 0 9, 0 5 2 5, #, 0 7, 3 4, 7 1, 4 7 5, #"

- If you enter the command "0 9", You can select the channel
ex) 0 9 X X X X (means channel number)
- The command "0 7" means Carrier On (Carrier Off : "0 8")
- If you enter the command "3 4", You can spread the carrier.
- If you enter the command "7 1", You can control the power output level. Following under-bar means AGC code. And you can control the power output level using Volume Up/Down Keys.
ex) 7 1 X X X

4. After enter the command "7 4" and control the Tx Power Output Level to be 0.0dBm using Volume Up/Down keys, press "STO" key to store Data in EEPROM.

4-4 Test Command Table

Command No. (OP, AB, RB)	Test Command	Description
01(1F, 0, 0)	T_SUSPEND_I	Terminate the normal mode, enter to the test mode.
02(3F, 0, 0)	T_RESTART_I	Terminate the test mode, enter to the normal mode.
03(FD, 0, 0)	T_SAVE_VAL_I	Save value in EEPROM. (Only for Auto test)
04(1D, 0, 1)	T_GET_MODE_I	Get mode. (CDMA or FM)
05(1C, 1, 0)	T_SET_MODE_I	Set mode to CDMA or FM. (Only for Auto test)
06(1E, 0, 0)	T_WRITE_NV_I	Write an EEPROM item. (one of the NV items)
07(81, 0, 0)	T_CARRIERON_I	Turn the carrier on.
08(82, 0, 0)	T_CARRIEROFF_I	Turn the carrier off.
09(83, 4, 0)	T_LOADSYN_I	Set the synthesizer to the channel specified by ch_ data.
10(84, 1, 0)	T_PWRLEVEL_I	Set the RF power attenuation to the specified value.
11(85, 0, 0)	T_RXMUTE_I	Mute the receive-audio signal.
12(86, 0, 0)	T_RXUNMUTE_I	Unmute the receive-audio signal.
13(87, 0, 0)	T_TXMUTE_I	Mute the transmit-audio signal.
14(88, 0, 0)	T_TXUNMUTE_I	Unmute the transmit-audio signal.
16(8F, 0, 0)	T_STON_I	Turn on ST.
17(90, 0, 0)	T_STOFF_I	Turn off ST.
22(91,96,96)	T_SNDNAM_I	Display and send NAM information.
23(95, 3, 4)	T_SNDVERSION_I	Display and return S/W version.
24(9F, 7, 8)	T_SNDESN_I	Display and return ESN.
25(92, 0, 0)	T_BACKLIGHT_ON_I	Turn on the backlight.
26(93, 0, 0)	T_BACKLIGHT_OFF_I	Turn off the backlight.
27(96, 0, 0)	T_LAMP_ON_I	Turn on the LAMP.
28(97, 0, 0)	T_LAMP_OFF_I	Turn off the LAMP.
29(9A, 0, 0)	T_REBUILD_I	Rebuild EEPROM.
30(9D,15, 0)	T_PLINE_I	Display and return production date.
32(A0, 1, 0)	T_SATON_I	Turn on SAT.
33(A1, 0, 0)	T_SATOFF_I	Turn off SAT.
34(A2, 0, 0)	T_CDATA_I	Continuously send TX control data.
35(A3, 0, 0)	T_VOLUME_UP_I	Increase value of the last command. (Only for autotest)
36(A4, 0, 0)	T_VOLUME_DOWN_I	Decrease value of the last command. (Only for autotest)
42(AA, 1, 0)	T_DTMFON_I	Activate dtmf generator with keycode.
43(AB, 0, 0)	T_DTMFOFF_I	Deactivate DTMF generator.
44(B0, 0, 0)	T_COMPANDORON_I	Turn on compandor.
45(B1, 0, 0)	T_COMPANDOROFF_I	Turn off compandor.
50(B6, 4, 0)	T_H_LIST_I	History Channel.
57(BC, 0, 0)	T_MIC_ON_I	Mic path on.
58(BD, 0, 0)	T_MIC_OFF_I	Mic path off.
59(BE, 0, 0)	T_ALLPATH_I	Set RX Path, TX Path Unmute to Earpiece.
67(C6, 3, 6)	T_READ_BATT_I	Reads Low-Battery in the standby, talk.

Command No. (OP, AB, RB)	Signal Name	Description
68(C8, 0, 3)	T_VBATT1_I	Set the low battery position in the standby.
69(C9, 0, 3)	T_VBATT2_I	Set the low battery position in the talking.
70(CA, 3, 0)	T_WRITE_BATT_I	Write low battery level value to NVM.
71(D1, 3, 0)	T_CDMA_TXADJ_I	Change PDM TX AGC in CDMA.
72(D2, 3, 0)	T_FM_TXADJ_I	Change PDM TX AGC in FM.
73(D3, 1, 0)	T_SET_PA_R_I	Set PA R1, R0 in CDMA.
74(D4, 3, 0)	T_TXADJ_0DBM_I	Set TX AGC ADJ for 0dBm power.
75(D5, 0, 3)	T_READ_RSSI_I	Read a RSSI.
76(D6, 3, 0)	T_WRITE_RSSI_I	Writes RSSI.
77(D7, 0, 3)	T_READ_TEMP_I	Read Temp.
79(D9, 1, 0)	T_BUZZER_ON_I	Buzzer On at DTMF 0 key.
80(DA, 0, 0)	T_BUZZER_OFF_I	Buzzer off.
81(E3, 0, 0)	T_VOC_PCMLPON_I	Play a PCM LOOP BACK.
82(E4, 0, 0)	T_VOC_PCMLPOFF_I	Play off a PCM LOOP BACK.
84(E6, 3, 0)	T_CD_MAX_LIMIT_I	CDMA MAX limit.
85(E7, 0, 0)	T_SPEAKER_ON_I	Turn on the speaker path.
86(E8, 0, 0)	T_SPEAKER_OFF_I	Turn off the speaker path.
87(E9, 0, 0)	T_FM_LOOP-TEST_I	Play a PCM FM loopback.
88(EA, 3, 0)	T_TRK_ADK_I	TRK LOCAL ADJUST.
89(EB, 3, 0)	T_CD_TRK_ADJ_I	CDMA TRK LOCAL ADJUST.
90(F0, 3, 0)	T_CDMA_LOW_CH_HIPWR_I	Setting the volume for LOW CH highpwr. (+18dBm)
91(F1, 3, 0)	T_CDMA_LOWMID_CH_HIPWR_I	Setting the volume for LOWMID CH highpwr. (+18dBm)
92(F2, 3, 0)	T_CDMA_MIDDLE_CH_HIPWR_I	Setting the volume for MIDDLE CH highpwr. (+18dBm)
93(F3, 3, 0)	T_CDMA_LOW_CH_LOPWR_I	Setting the volume for LOW CH lowpwr. (-41dBm)
94(F4, 3, 0)	T_CDMA_LOWMID_CH_LOPWR_I	Setting the volume for LOWMID CH lowpwr. (-41dBm)
95(F5, 3, 0)	T_CDMA_MIDDLE_CH_LOPWR_I	Setting the volume for MIDDLE CH lowpwr. (-41dBm)
96(F6, 3, 0)	T_CDMA_HIGHMID_CH_LOPWR_I	Setting the volume for HIGHMID CH lowpwr. (-41dBm)
97(F7, 3, 0)	T_CDMA_HIGH_CH_LOPWR_I	Setting the volume for HIGH CH lowpwr. (-41dBm)
98(F8, 3, 0)	T_CDMA_HIGHMID_CH_HIPWR_I	Setting the volume for HIGHMID CH highpwr. (+18dBm)
99(F9, 3, 0)	T_CDMA_HIGH_CH_HIPWR_I	Setting the volume for HIGH CH highpwr. (+18dBm)

* OP: Operation Command Number

AB: Input Argument Byte Number

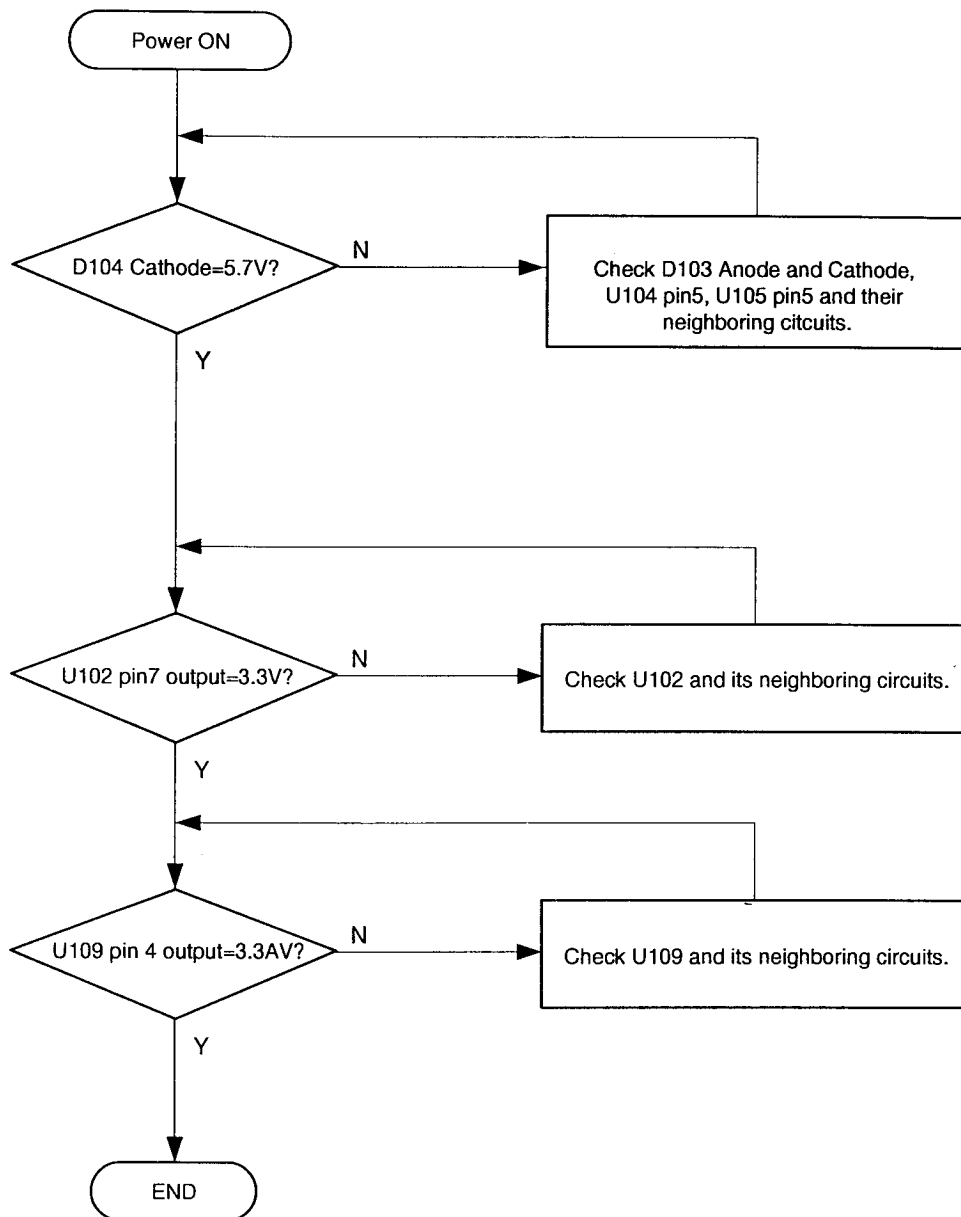
RB: Return Byte Number

5. Troubleshooting

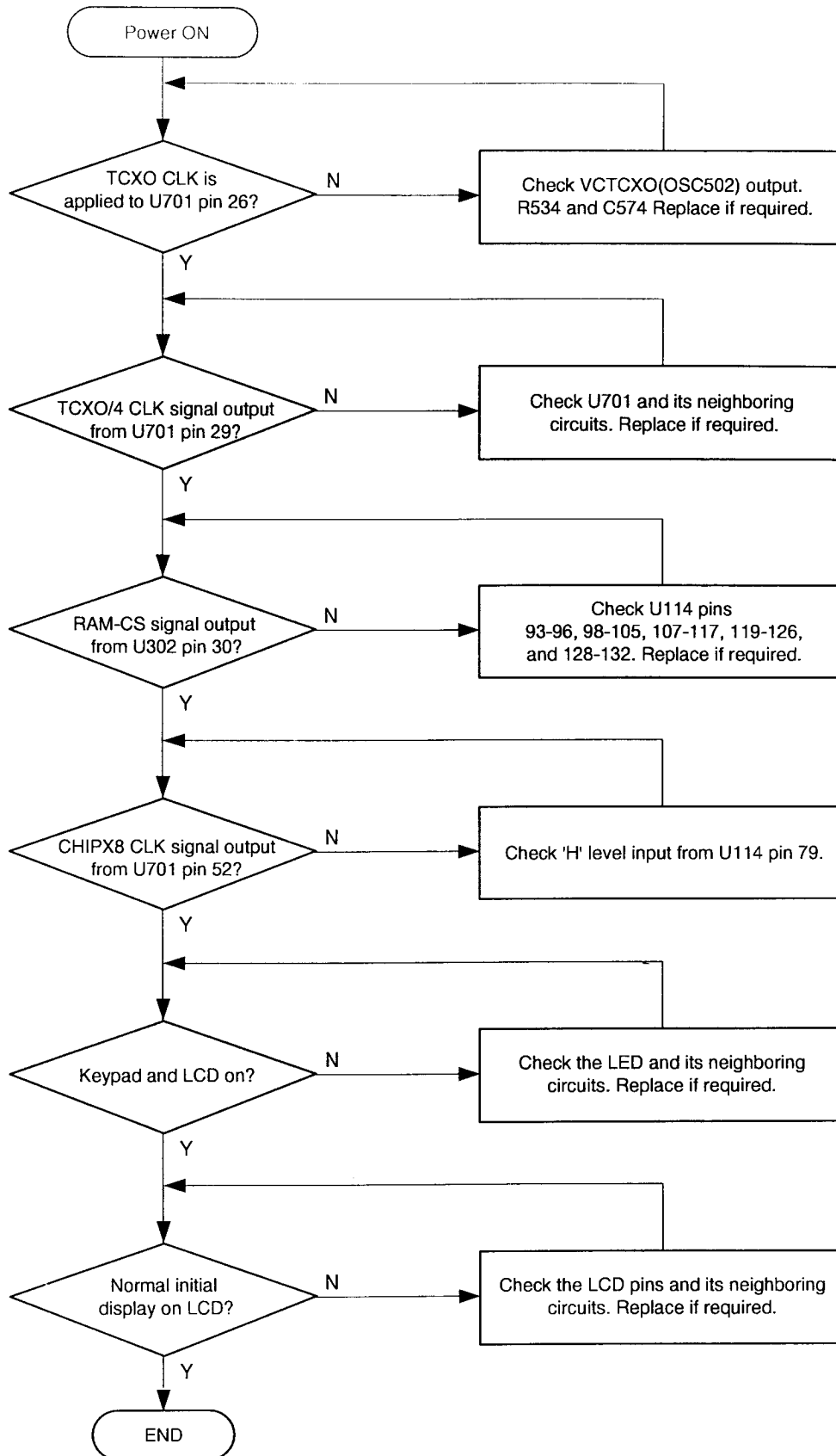
5. Troubleshooting

5-1 Logic Section

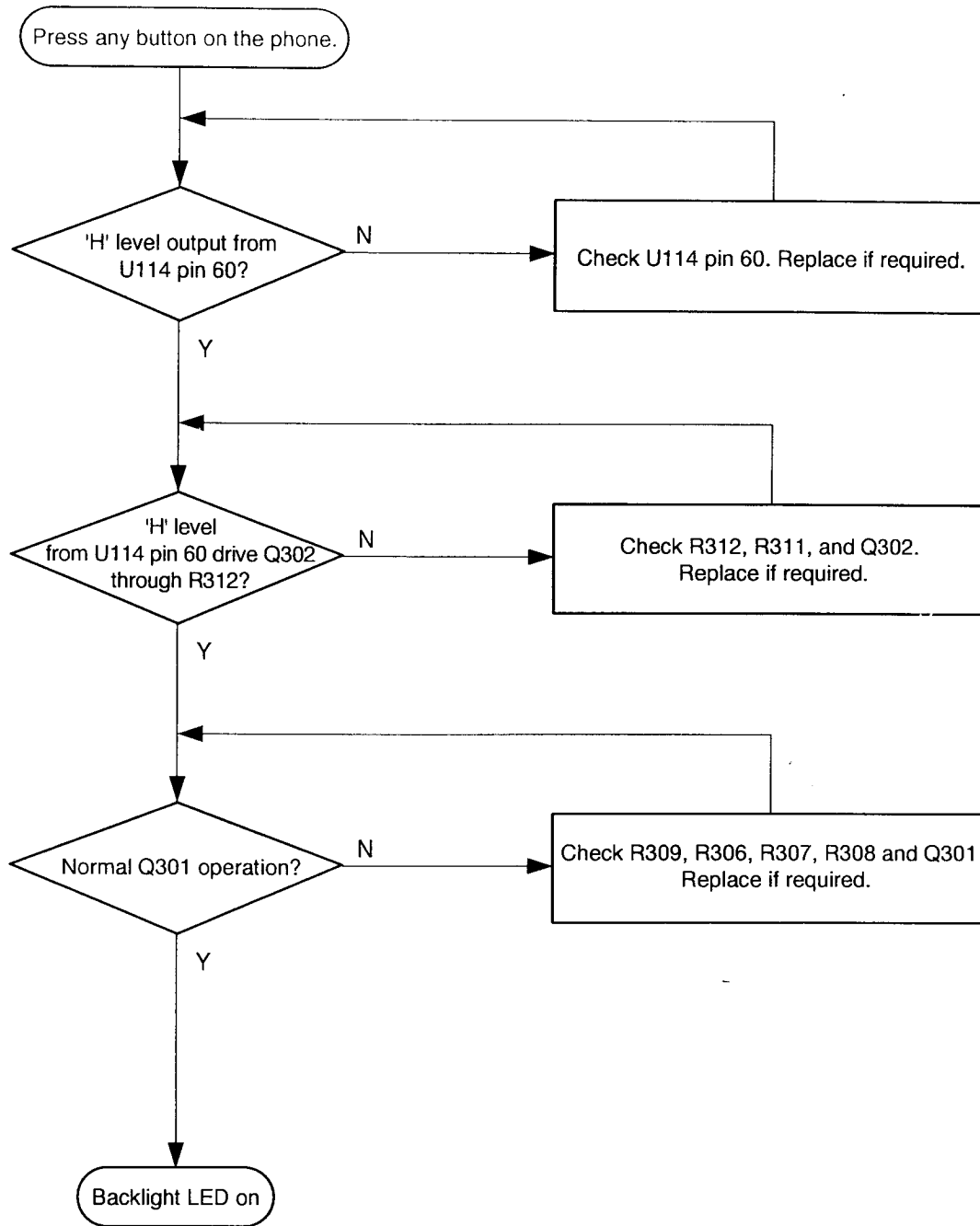
5-1-1 No Power



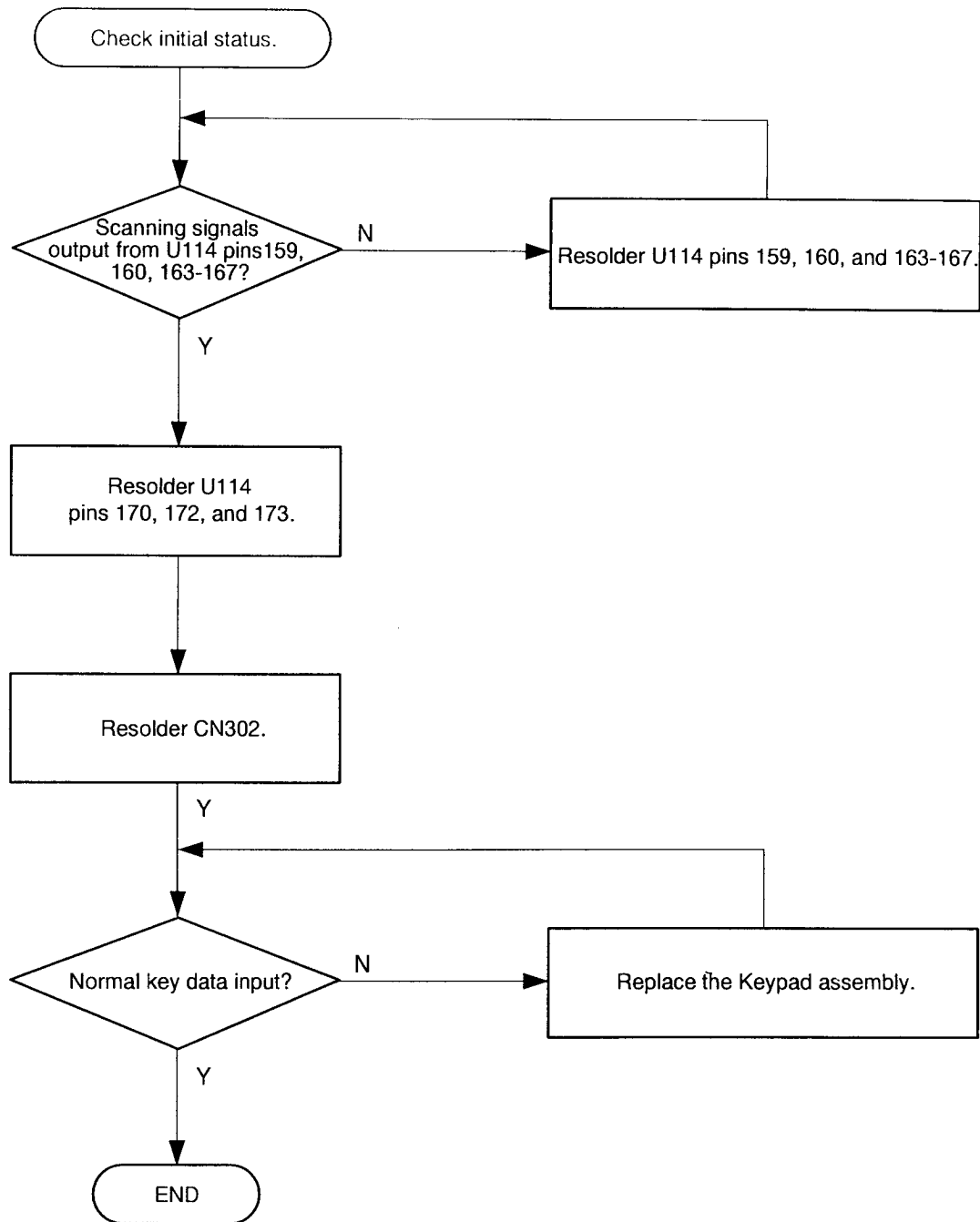
5-1-2 Abnormal Initial Operation (Normal +3.3V voltage source)



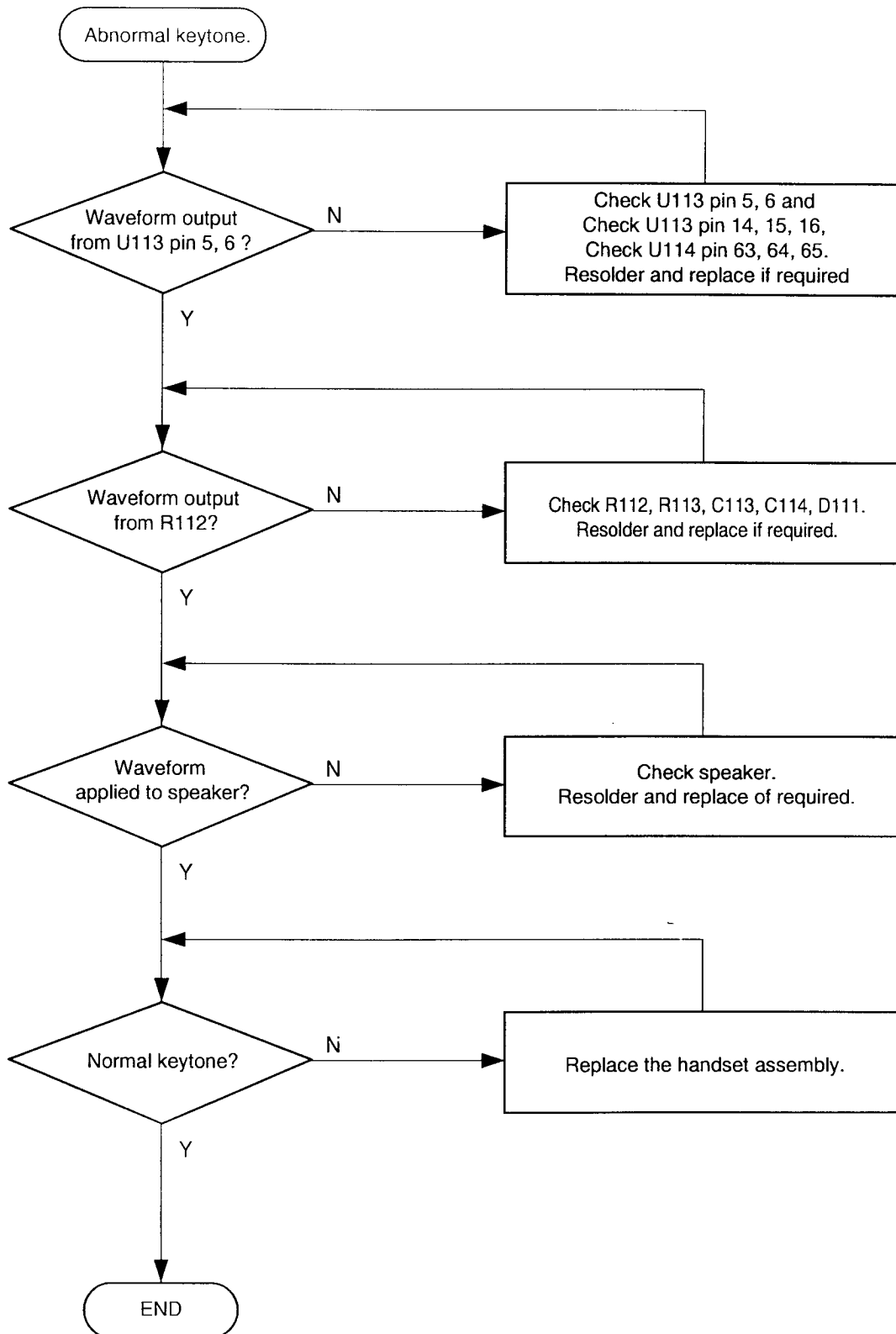
5-1-3 Abnormal Keypad Backlight Operation



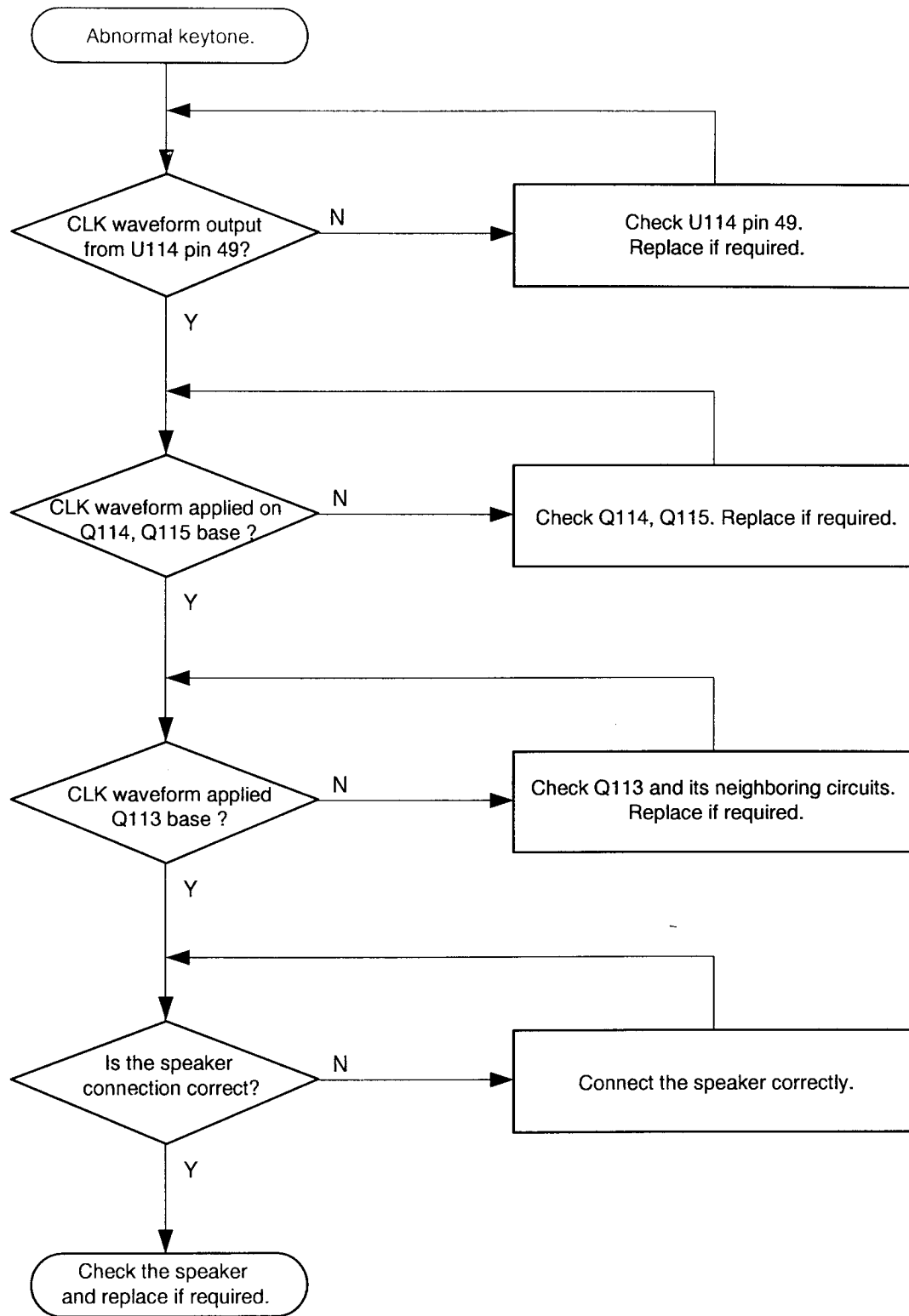
5-1-4 Abnormal Key Data Input



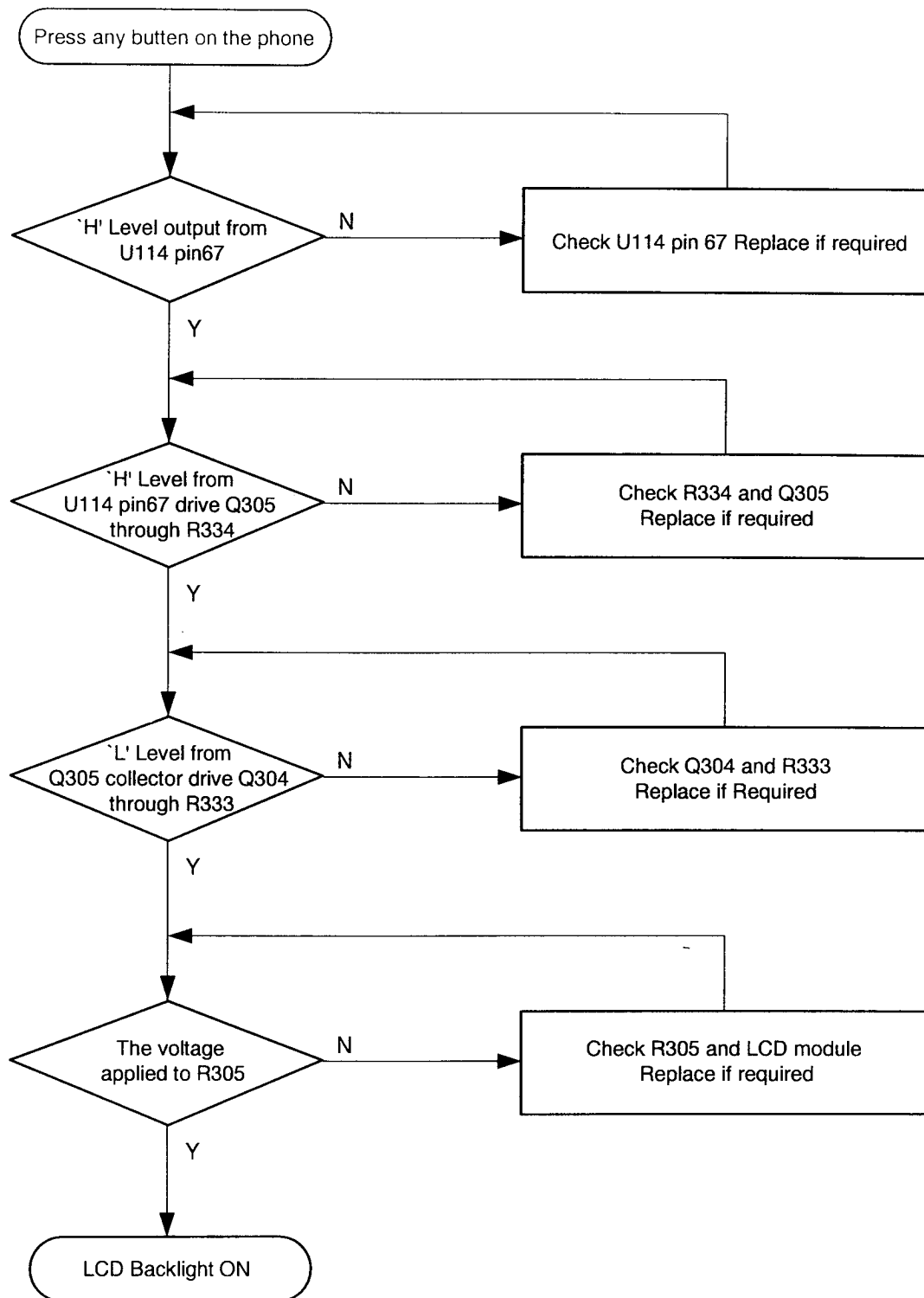
5-1-5 Abnormal Keytone



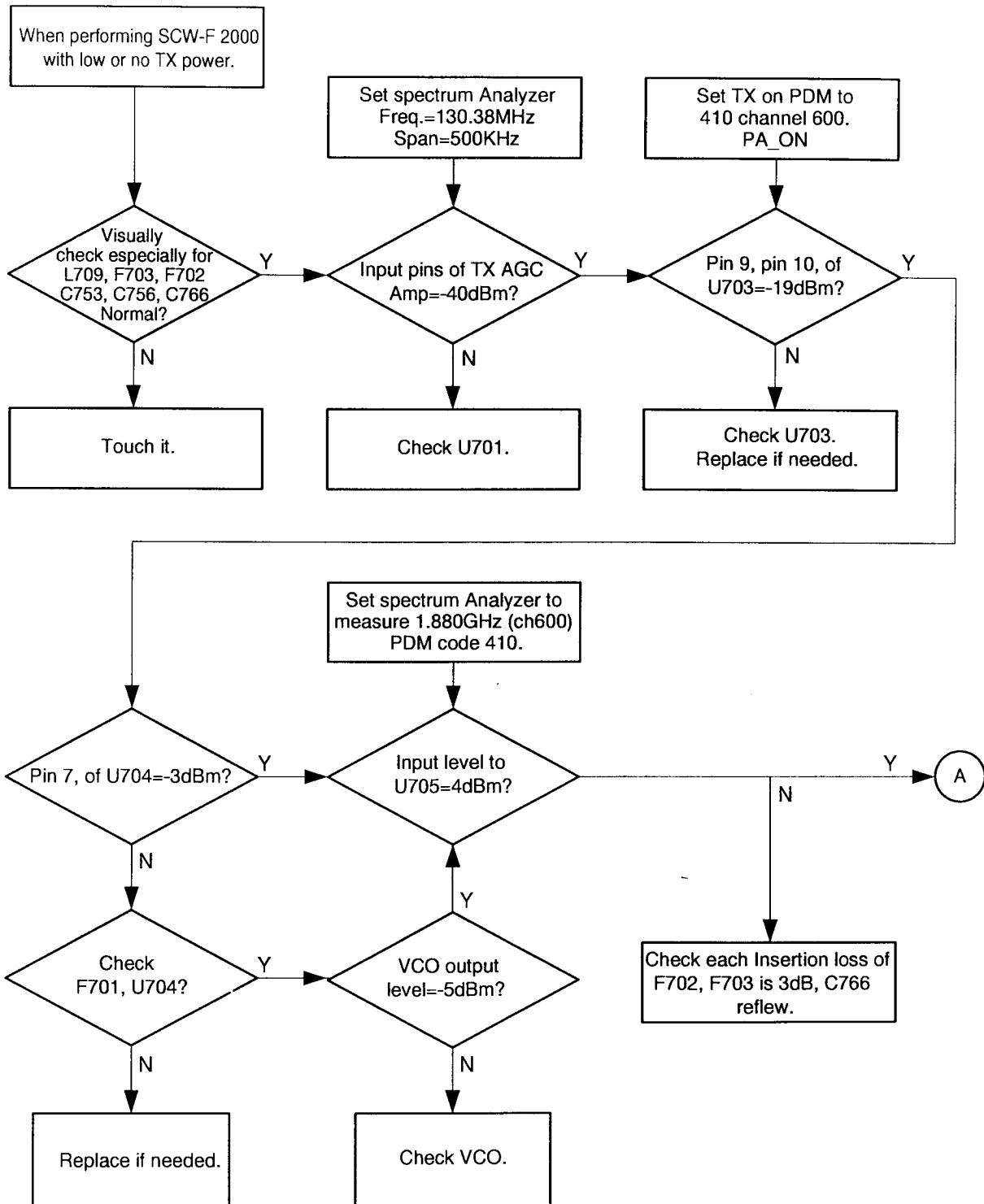
5-1-6 Abnormal Alert Tone

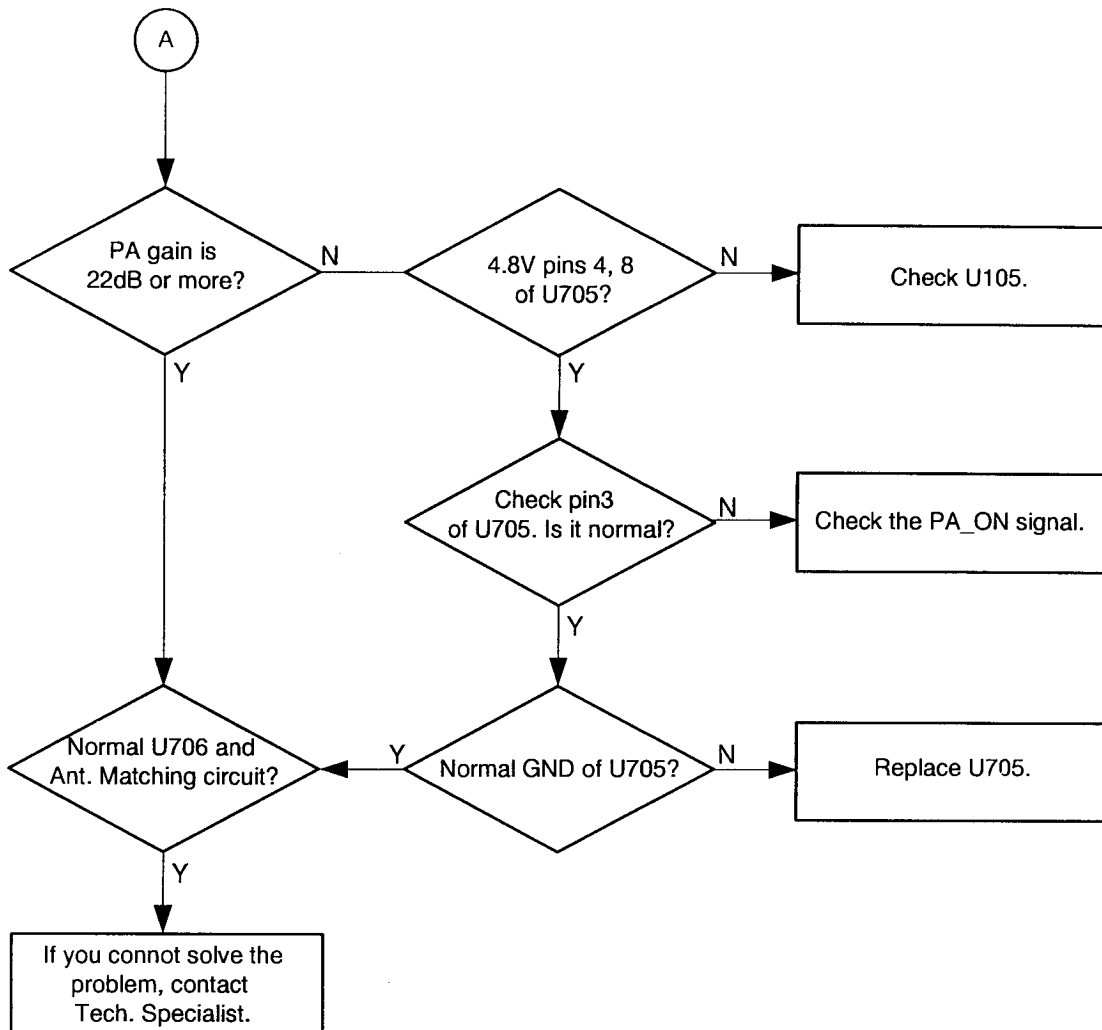


5-1-7 Abnormal LCD Backlight Operation



5-2 Transmitter Section





5-3 Receiver Section

