MOTOROLA

Cellular Subscriber Sector

CDMA StarTAC Single Band Single Mode - 1900 MHz CDMA

The World's Leading Cellular Telephone Manufacturer

Service Manual
Level III

MOTOROLA

Personal Communication Sector

StarTAC 7762 Service Manual V1.0
(Personal Communication Service)

MOTOROLA CSS
Cellular Subscriber Sector Service training

Contents

1 Cellular System Overview

1.1 Overall Concept

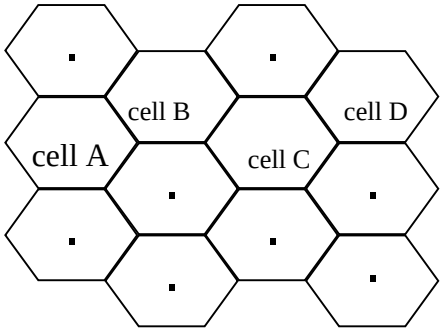
A cellular system provides higher call handling capacity and system availability than would be possible with conventional radiotelephone system that require total system area coverage on every operating channel. The cellular system divides the system coverage area into several adjoining sub-areas, or cells.

Each cell contains a base station (cell site) which provides transmitting and receiving facilities. CDMA is a spreading spectrum technology, which means that it spreads the information contained in a particular signal of interest over a greater bandwidth than the original signal.

With CDMA, unique digital codes, rather than separate RF frequencies or channels are used to differentiate subscribers. The codes are shared by both the mobile station and base station and are called pseudo-random code sequence. Since CDMA is a spread spectrum technology, all users share a range of the radio spectrum.

CDMA cell coverage is dependent upon the way the network is designed. For each system 3 characteristics must be considered: coverage, quality, and capacity. These 3 must be balanced for desired level of performance.

Some of the CDMA benefits are:



- Improved call quality with better and more consistent sound.
- Enhanced privacy.
- Variable rate vocoder.

1.2 Operation

In figure Hypothetical Cell System, the area bounded by bold lines represents the total coverage area of a cellular system.

This area is divided into several cells, each containing a cell site base station which interface radiotelephone subscribers to the switching system.

Since there are no channels in CDMA, a user has a better chance of completing a call. Also, now there is no hard handoff between cell sites since all sites operate on the same frequency. This is called soft handoffs. In this system, subscribers in cell A &D simultaneously operate in the same frequency.

As a user moves from cell site to cell site, the base station monitors the signal strength of the user. Based on this signal strength, the base station decides which cell shall carry the call.

When a radiotelephone is in use well within a cell, the signal strength received at the cell site base station will be high. As the phone is moved towards the edge of the cell, its received signal strength decreases.

Signal strength information therefore provides an indication of the subscriber's distance from a cell's base station. This change is handled automatically, and is completely transparent to the user.

For example, assume that a cellular telephone initiates a call in cell A and then moves across the system area through cells B and C to cell D. As the phone moves into cell B, it is instructed to change to a different frequency that operates through the B cell on that frequency.

A similar change is performed when the phone moves from cell B to cell C and again when the phone moves from cell C to cell D.
In this example, the radiotelephone has operated in four cell sites, through four cell sites, and on the same spread spectrum without interruptions in voice communications. As the radiotelephone leaves a cell, the frequency on which the phone and base station were operating is made available to another subscriber in that cell.

1.3 Service Area

The area within which calls can be placed and received is defined by the system operator.(Because this is a radio system, there is no exact boundary that can be drawn on a map.)

If the portable is outside the radio service area, a NS(no service) message will appear on the phone's display, and calls cannot be placed or received. If this happens during a conversation, the call is lost.

Places where the ability to place or receive calls would be lost are in totally enclosed areas, such as underground parking garages, in buildings without windows and in elevators.

This situation would be indicated either by the NS message illuminating, or by the sound of either a fast busy signal or a high-low siren signal when call placement is attempted.

General usage in buildings having reasonable glass area is usually quite good. However, it may be necessary to move closer to a window to ensure reliable operation.

2 PERFORMANCE SPECIFICATION

General

Function	*Specification*
Frequency Range	1850 to 1910 MHz(TX),1930 to 1990(RX)
RF Channel Bandwidth	1.25MHz
Channels	1200
Duplex Spacing	80MHz
Frequency Stability	Center Frequency * +/- 8.5 x 10^{-8} +/- 150Hz of incoming RX CDMA signal
Operation Voltage	+3.6 V nominal (3.0 - 4.2V DC)
RF Power Output	0.20 Watts - 23dBm into 50 ohms(CDMA, nominal)
Input/Output Impedance	50 ohms(nominal)
Spurious/Harmonic Emissions	Complies with Title 47, Part 22 of the code of Federal Regulations
Vocoders	8kbps, 13kbps, EVRC
Transmit Time Error	+/- 1 us
Modulation Type	1M25D1W(1.25MHz bandwidth), OQPSK, G7W(CDMA)
Transmit Duty Cycle	Variable - full, 1/2, 1/4, 1/8 rate(CDMA Mode)
CDMA Transmit Waveform Quality(Rho)	0.94
Receive Sensitivity	-104dBm(CDMA, 0.5% Static FER,8kbps Vocoder)
Display	96x32 LCD

Environmental

Function	***Specification***
Temperature Range	Operational -30 deg. celsius to +60 deg. celsius Storage -40 deg. celsius to +85 deg. celsius Thermal Shock -40 deg. celsius to +85 deg. celsius
Shock	Exceeds EIA Standards RS152B(Section 15) and IS-19
Drop	Exceeds EIA Standards RS316B and IS-19
Humidity	80% Relative Humidity: meets EIA Standards IS-19
Vibration	Exceeds EIA Standards RS316B and IS-19
Salt Fog	Salt Solution fog at 35□(95□), tested for 48 hours
Dust	140 mesh blown silica flour test, tested for 5 hours

NOTES:

(1) EIA(Electronic Industries Association) Standard RS152B states the minimum standards for Land Mobile Communications, FM or PM transmitters 25-470MHz.

(2) *EIA IS-19 states the recommended standards for 800MHz cellular subscriber units.*

(3) *EIA Standard RS316B states the standards for portable land mobile communications.*

(4) *US Military Standard 810D establishs uniform environmental test methods for determining the resistance of equipment to the effects of natural and induced environments peculiar military operations.*

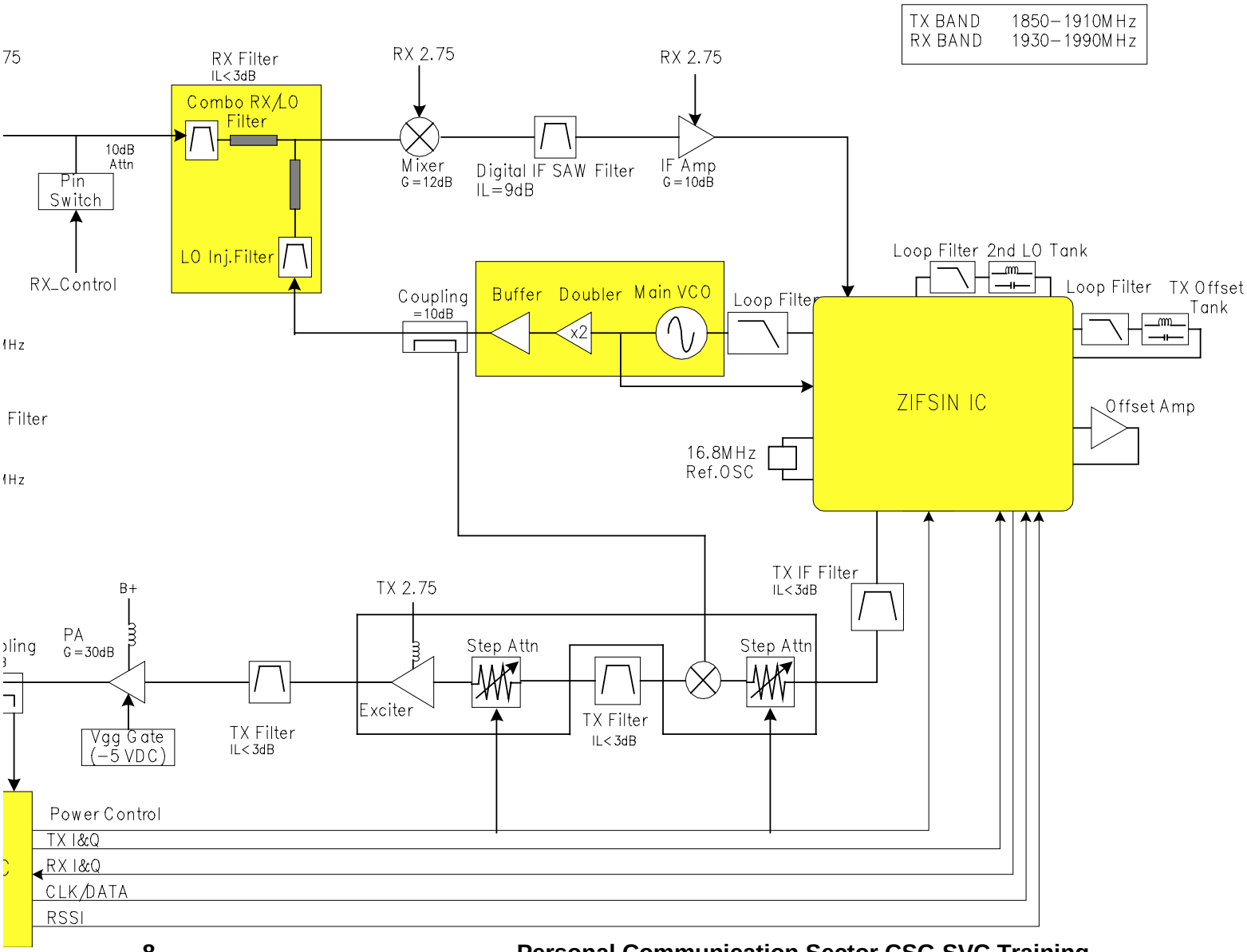
(5) *TIA/EIA/IS-98 Recommended Minimum Performance Standards for Dual-Mode Wide band Spread spectrum Cellular Mobile Stations.*

3 Model Structure

. The name of unit: ST7762 PCS radio using 1900MHz frequency band
. Manufactured by Motorola Inc.
. The concept of this unit
    . Modulation Type: G7W, 1M25D1W(1.25MHz Bandwidth) CDMA
    . Frequency Range: 1850-1910MHz TX /1930-1990 MHz RX
    . Output Power: 0.2W
    . Means for limiting power: In the digital mode, the transmitter operates in the CDMA mode as specified in TIA/EIA IS-95-A Chapter 6 and SP3385. The transmission duty cycle varies with the transmission data rate. At data rates of full, 1/2,1/4, and 1/8 bits/second, the average transmission duty cycle is 100, 50, 25, and 12.5 percent respectively. The output power level of the transmit signal is initially set based on an input level of the received signal and then corrected by a command received from the CDMA base station. Setting the output power based on the input level of the received signal is refered to as open loop power control. Correcting the output power level of the transmitted signal by the CDMA base station is refered to as closed loop adjustment.
. The voltage and current of P.A, U9913: 620mA, 3.6V(CDMA)
. Frequency Tolerance: Center frequency x +/- 8.5×10^{-8} (+/- 150Hz)
. Means for attenuation of spurious emission: Spurious and harmonics suppression is obtained by proper circuit design, shielding techniques, and the use of ceramic bandpass filters.
. Others
    Operation Voltage : 3.6VDC
    The number of channel : 1200(CDMA)
    Channel Spacing : 1.25MHz(CDMA)
    Duplex Space : 80MHz
    Operation Temperature: -30 deg. celsius ~ +60 deg. celsius

4 RF Theory of Operation

4-1 RF BLOCK DIAGRAM



4-2 Receiver Circuit

RF enters the phone via the internal antenna A1 or via the accessory connector. RF switch U75 selects which antenna is used. The received RF signal is routed through monoblock duplex filter FL75. Then the filtered RF signal is routed through Low noise amplifier Q100. The received signal then passes through the Mixer Q1906, IF filter FL404, and IF amplifier Q1901.

The local oscillator input to the mixer is a 1690 - 1750 MHz VCO, U626, controlled by the IF/Synthesizer IC U700. The 238.55MHz mixer output is routed to the CDMA IF filter FL404 and CDMA IF amplifier Q1901. The IF signal then enters the IF/Synthesizer IC U700 to be down-mixed again and demodulated.

4-3 Transmitter Circuitry

The modulated 158.55MHz TX Offset VCO signal is mixed with the 1690 - 1750MHz local oscillator signal in TX Mixer U400 to produce an 1850-1910MHz transmit signal. This signal passes through filter FL401 and voltage controlled attenuators in U400 which control the TX output power. Then the TX signal is amplified by U400 exciter, bandpass filtered by FL402, and amplified by TX Power Amplifier U9913. The PA output passes through the monoblock duplex filter FL75 to RF switch U75 to either the internal antenna or the the Isolator U475 and them.

4-4 Frequency Synthesizer Circuitry

The phone contains three PLL frequency synthesizers in the IF/Synthesizer IC U700. One synthesizer controls the tunable 1690 - 1750MHz main local oscillator, U626. The second synthesizer controls the TX offset oscillator(internal to U700) which operates at a fixed frequency of 317.1MHz for CDMA. TX modulation occurs in the TX offset synthesizer CDMA modes. The third synthesizer(also internal to U700) operates at a fixed frequency of 477.1MHz for 2^{nd} Local Oscillator. This oscillator is divided by 2 and used to mix the received first IF signal down to baseband. All synthesizer obtain their frequency reference from the 16.8 MHz reference oscillator, U325. Active temperature compensation is employed using temperature sensor U102.

4-5 Transmit Power Control Circuitry

The power control signal controls voltage controlled attenuators in U400 which are after the TX mixer. U1900 compares a detected sample of the TX output signal with a variable reference voltage.

The RF power range is -50dBm to +24dBm. In CDMA mode, the power control can operate in either open-loop or closed-loop modes. In open-loop mode, the power level is proportional to the received signal level. In closed loop mode, the power level is controlled by the CDMA cell, based on received signal strength at cell site.

4-6 Received Audio - CDMA mode

Received CDMA QPSK data(RX I, RX Q) is gain controlled and converted to digital by U1900. The 1.2288Mb/sec. RX data stream is then decoded by the U1900 Modem IC and U1700 Crib to produce a signal containing only the desired data. The digital speech data is routed through the microprocessor U1100, decoded by the U1600 CELP Vocoder, and sent to U1900 to be converted into analog audio. The audio signal is then amplified by U2000 and sent to the earpiece speaker.

4-7 Transmit Audio - CDMA Mode

In CDMA mode, the digitized TX audio is processed by a CELP variable rate vocoder, U1600. The digital signal is then routed through microprocessor U1100 and processed by the CDMA Modem part of U1900, which produces the 1.2288Mb/sec. CDMA data stream. This stream is then converted to analog OQPSK signals(TX I, TX Q) by D/A U1900. The TX I and TX Q signals are sent to the IF/Synthesizer IC U700 which modulates the 158.55MHz TX offset frequency.

5 A/L Theory Of Operation

5-1 A/L Block Diagram

5.2 MCU (U1100) IC

The MC68338 is a low power and highly-integrated 32-bit Micro-controller. The MCU provide external 16-bit Data bus and A0-A23 Address bus and 12 Chip Select Signals and the MCU controls all the part of the phone and execute the S/W program.
The MCU clock is provided from external 32.749khz input through CIA CLK2.

5.3 Flash ROM (U1200) IC

The Flash ROM is the 8Mbit (512kx16bit) low power memory. The main program source is stored in this Flash ROM and the program can be downloaded by software upgrade kits.

5.4 SRAM (U1300) IC

The SRAM is the 1Mbit (64kx16bit), low power, CMOS memory. Data, parameters for program execution are stored in this SRAM and will be cleared when power is off and while the power-cut operation, the RAM will keep the data.

5.5 EEPROM (U1400) IC

The EEPROM has a size of 128kbits and communicate with MCU through the SPI bus. The data like NAM, ESN etc, which should not be lost while power down will be stored in EEPROM.

5.6 CIA (U1900) IC

The CDMA Interface to Analog (CIA) chip is to provide data converter interface between the CSP and the RF and between the DSP and the Audio circuit. The CIA communicate with MCU through the SPI bus

5.7 CRIB (U1700) IC

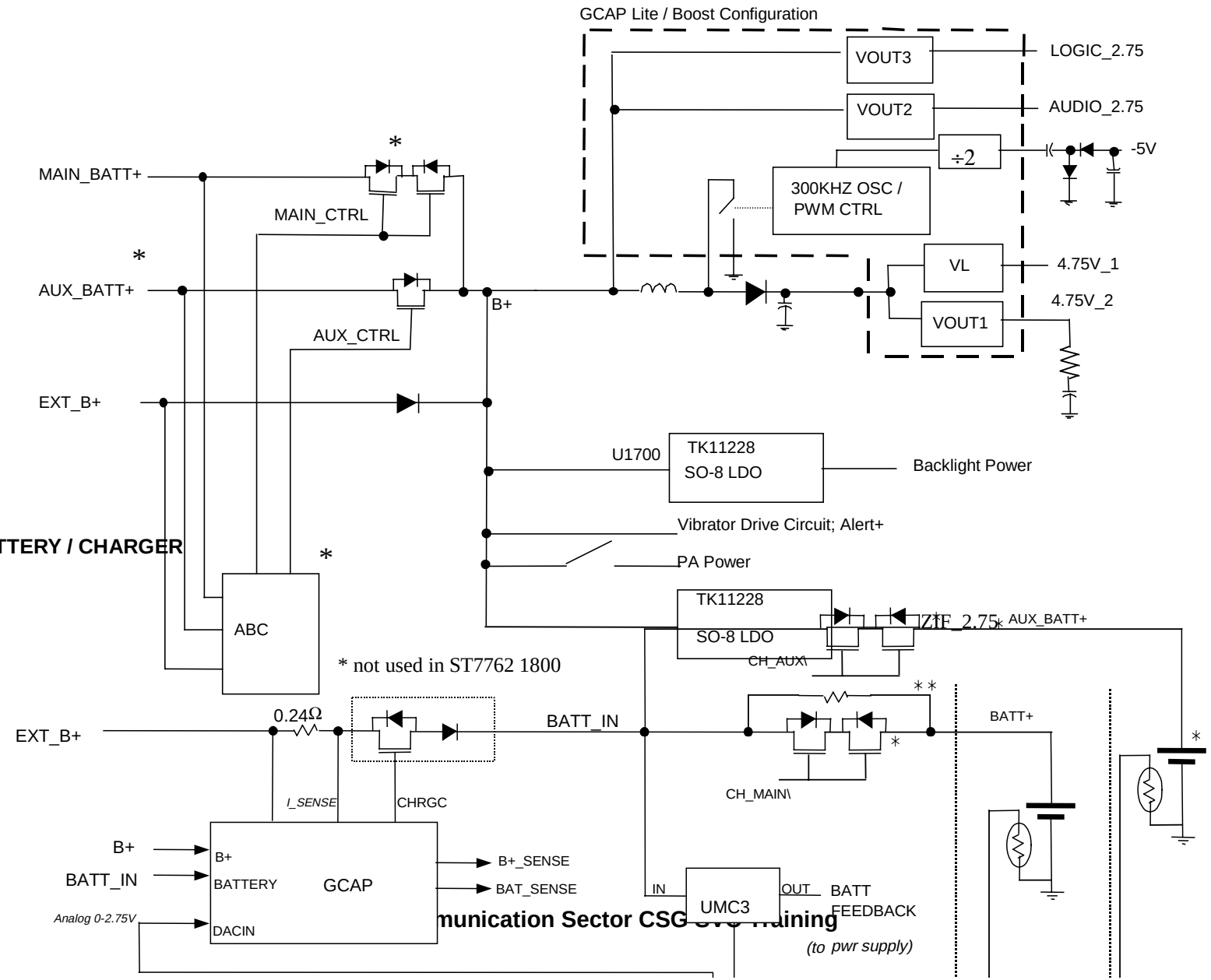
The CRIB consists of the CDMA Signal Processor (CSP) and Really Important Blocks (RIB). The CSP have CDMA MODEM functions as defined as IS-95 spec. The RIB has functions as followings

- ASIC Chip select generation
- ADDR / DATA buffering
- Interrupt Generation
- Clock Generation : Watchdog
- 3-wire bus and SCI port Interface
- Keypad scanning and Display control
- Power-cut support

5.8 DSP (U1600) IC

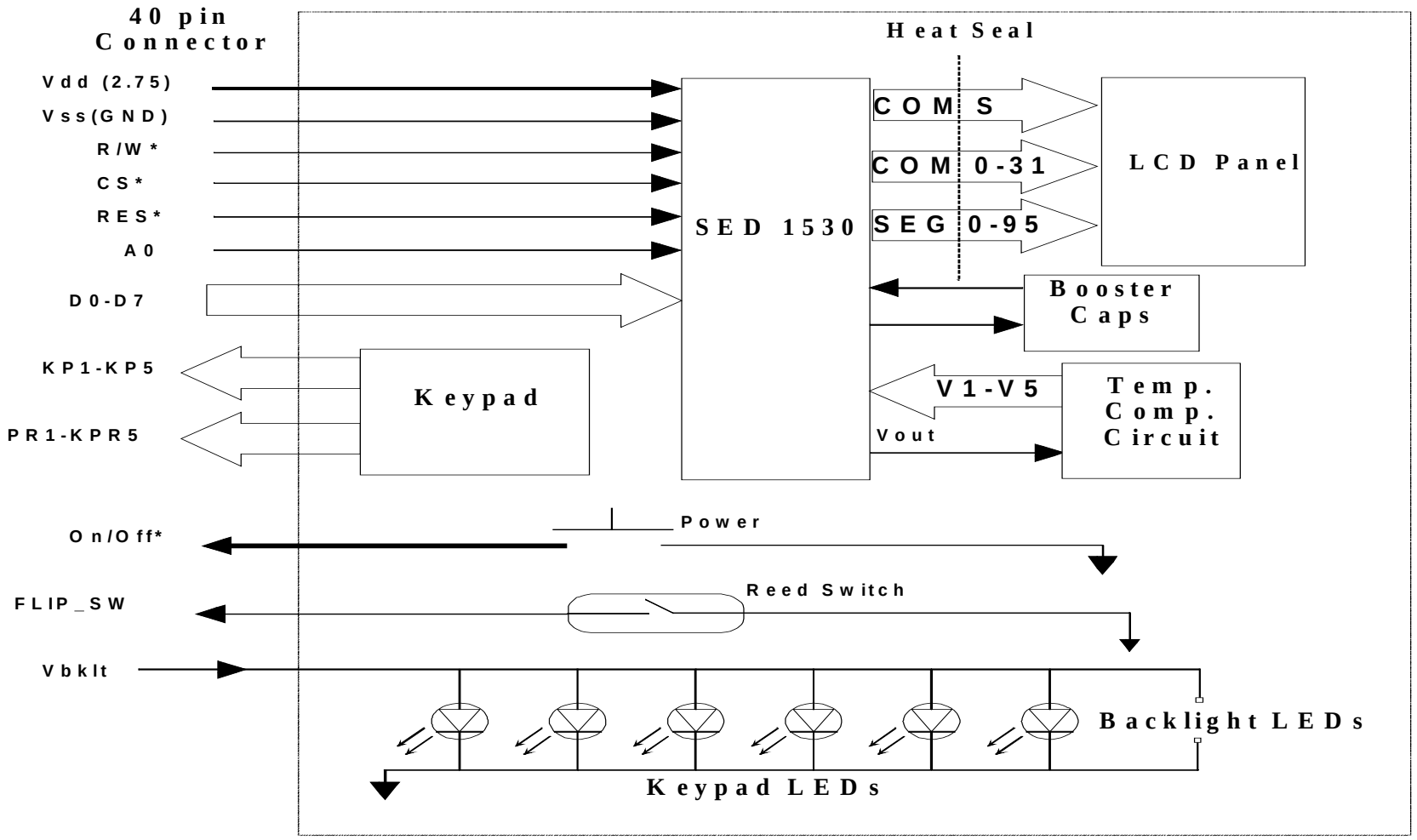
Motorola Digital Signal Processor (DSP) 56603 is a one of the 16-bit DSP56600 core family of programmable CMOS DSP and includes a mixture of peripherals and large memories.
The DSP perform the 8k, 13k Q-CELP Vocoder and interface the data with CIA through Codec serial bus.
In CDMA mode, the DSP receive and transmit the CDMA data from/to MCU and receive the Power Control Data from CSP and process and transmit to CIA.

5.9 POWER SUPPLY

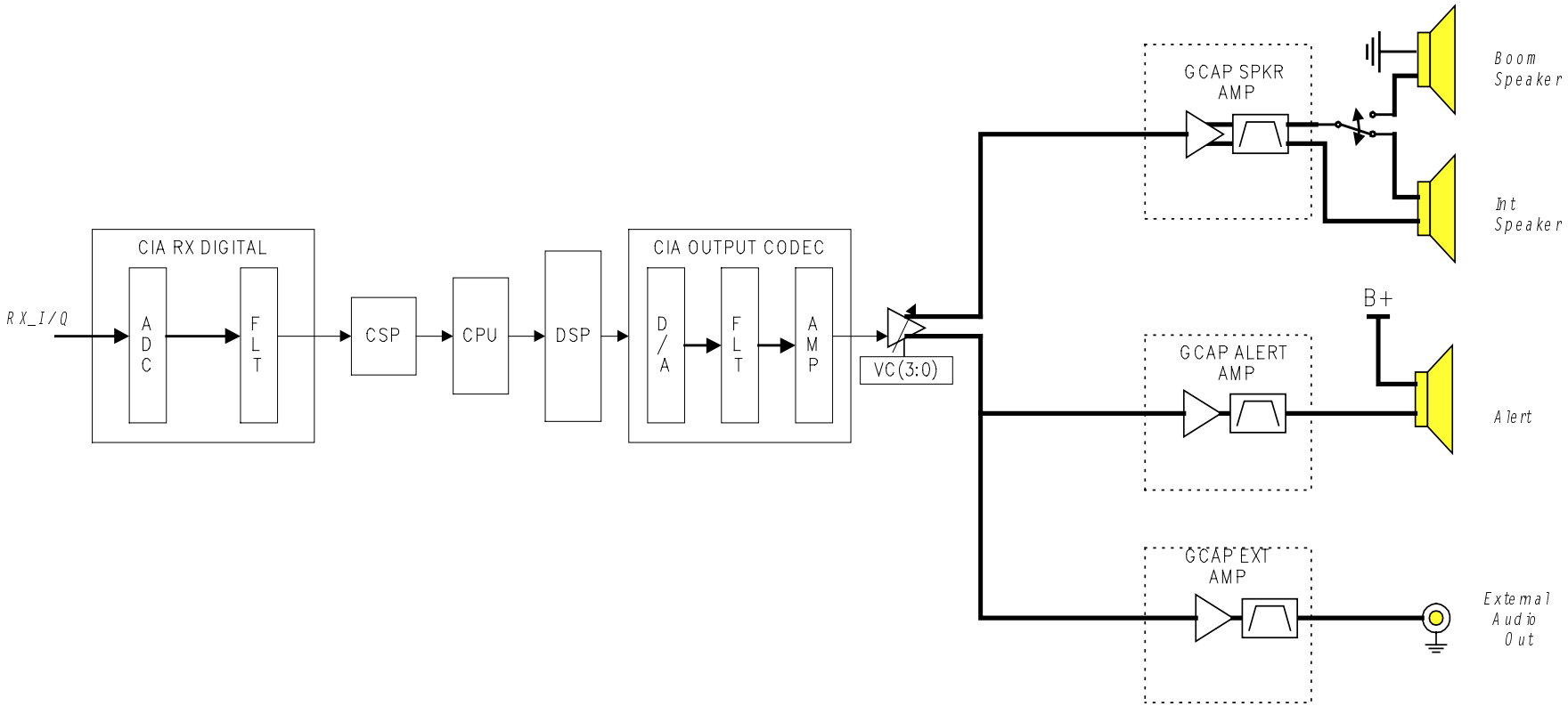


5.10 BATTERY / CHARGER

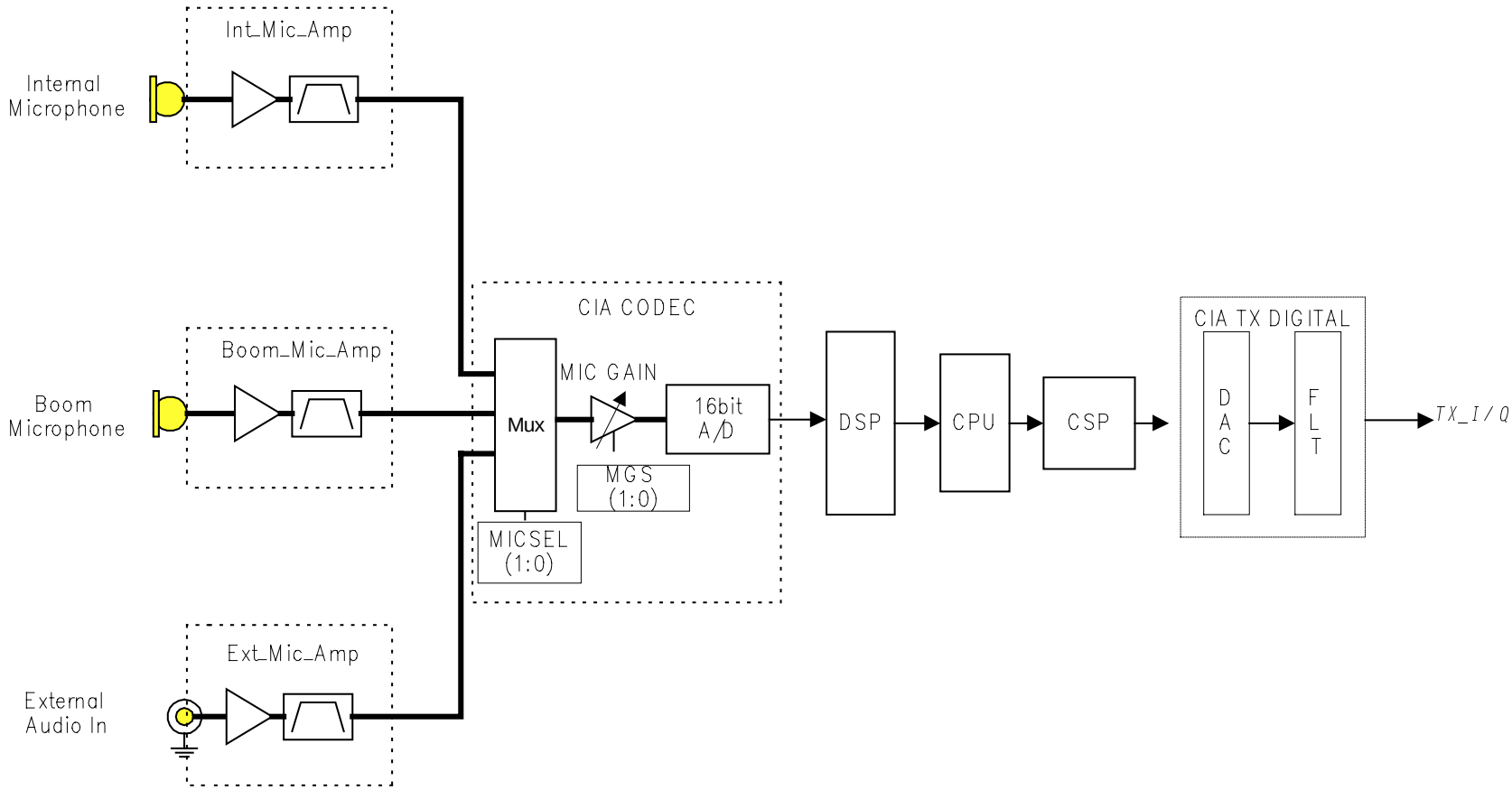
5.11 DISPLY/ KEYPAD



5.12 FORWARD AUDIO



5.13 REVERSE AUDIO


Int_Mic_Amp
Internal Microphone
Boom_Mic_Amp
Boom Microphone
Ext_Mic_Amp
External Audio In
CIA CODEC
Mux
MIC GAIN
16bit A/D
MGS (1:0)
MICSEL (1:0)
DSP
CPU
CSP
CIA TX DIGITAL
D A C
F L T
TX_I/Q

- Forward Audio

There are four outputs in the forward path: Boom speaker output for headset, Internal speaker output, alert and external audio output for the DHFA. The analog signals are applied to the RX I/Q inputs of the CIA. The CIA digitizes the signal and passes the data to the CSP block in the CRIB. The CSP removes much of the CDMA bit stream overhead and passes the CDMA packets to the uP. The uP extracts the voice packets and passes them to the DSP. The DSP processes the voice packets and passes this digitized audio to the CIA output CODEC. The CIA output CODEC reconstructs the analog audio and passes it to the GCAP. The GCAP contains amplifiers, which drive the audio to possible destinations. Same amplifier drives boom & internal speakers, so they are selected by mechanical switch.

- Reverse Audio

The reverse audio section starts at the three audio sources: internal microphone, boom microphone and external audio input. These sources are applied to the CIA input audio section, which provides amplification for all three paths, and a MUX to select which input will be routed to the CIA input CODEC. The CIA input CODEC is a 16bit linear CODEC sampled at 16kHz. The digitized audio is passed to the DSP, which filters and wave shapes the audio. The audio is processed by the VOCODER into reverse voice packets. The voice packets are sent to the uP, which places the voice packets into the CDMA packets. The CDMA packet is passed to the CSP in the CRIB, which adds the error correction and overhead bits to produce the final CDMA bit stream. The CSP sends the CDMA bit stream to the TX I/Q digital block in the CIA where it is converted into analog base band signals, TXI and TXQ. These signals are applied in the ZIF/SYN in the RF section.

6 TEST MODE/TEST MENU

Manual Test Mode software allows service personnel to monitor the telephone status on the display, and manually control telephone functions via the keypad.
Press **Fun + 0 + 0 + * + * + 8 + 3 + 7 + 8 + 6 + 6 + 3 + 3 + sto**,
and then press **#** to go into manual test mode.

Handset Test Command for Manual Test Mode

Keypad Entry	Command Description	Result
#	SUSPEND	Terminate normal mode and enter Test Command Mode. The # key must be held for 2 seconds to suspend.
04#	INITIALIZE TRANSCEIVER	Initialize the current radio as follow 1. Carrier off 2. RF Power attenuation set to level 2 3. Signaling tone off 4. Audio path set to speaker

		5. Rx and Tx audio muted
11ABCD	LOAD-SYNTH	Load the specified channel into the radio synthesizer. Channel numbers must be in the range of 25 to 575.
27A#	CDATA	CDMA: Random Transmit Data(RTD) on the reverse CDMA channel. Input Action 0 Start(AMPS)/Variable Rate(CDMA) 1 Full Rate(CDMA) 2 Half Rate(CDMA) 4 Quarter Rate(CDMA) 8 Eighth Rate(CDMA) 9 Stop RTD(AMPS,CDMA)
55#	PROG-NAM	Programs the NAM through the handset
57#	CP-MODE	Select radio call processing mode. this command will set up the radio to operate in the mode selected and will also perform initialization as specified by the INIT command 5 CDMA Signaling

7 NAM programming

7.1 Test Mode NAM programming sequence description

Step	*Factory Default*	*Description*
01	04369	Reserved
02	00000000	Option Byte A
03	0000000000	User 10 digit radiotelephone phone number(MIN)
04		Station Class Mark(SCM)
	010	CDMA Only & Non-Slotted Mode configuration
	042	CDMA Only & Slotted Mode configuration
05	00	Access Overload Class
06	000000	Security Code
07	123	Unlock Code
08	4	Service Level
09	00000000	Option Byte B
10	00000000	Option Byte C
11	0334	Reserved
12	0333	Reserved
13	0334	Reserved
14	0021	Reserved
15	00001000	Option Byte D
16	00100111	Option Byte E
17	2	CDMA Slot Cycle Index
18	XXXXX	CDMA SID
19	XXXXX	CDMA : Network ID Number

20	11111	Mobile Country Code(first 3-digits)
21	XXXX	CDMA :Primary Channel. system A up to 4 decimal digit.
22	XXXX	CDMA :Primary Channel. system B up to 4 decimal digits.
23	XXXX	
24	XXXX	CDMA :Secondary Channel. system A up to 4 decimal digits.
25	XXXXX	
26	XXXXX	CDMA : Secondary Channel. system B up to 4 decimal digits.
		CDMA SID #2
		CDMA : Network ID Number 2

7-2 Test Mode NAM Programming Sequence

To go into test mode, press the key pads

Fcn + 0 + 0 + * + * + 8 + 3 + 7 + 8 + 6 + 6 + 3 + 3 + Sto

and then you can see US' which is meaning the radio is in test mode.

Keypad	Display	Contents
	01	04369
*	02	00000000
● *	03	User 10 digit radiotelephone
*	04	number
*	05	042
*	06	00
*	07	Security Code
*	08	Unlock Code
*	09	4
*	10	00000000
*	11	00000000
*	12	0334
*	13	0333
*	14	0334
*	15	021
*	16	00000000
*	17	00100111
	18	2
		KTF:02180
*		LGT:02190
	19	Hansol:02218
		KTF:00022
		LGT:00000
		Hansol:00070
*	20	
*	21	11111
		KTF:75

*	22	LGT:475 Hansol:300 KTF:75
*	23	LGT:475 Hansol:300 KTF:125
*	24	LGT:525 Hansol:250 KTF:125
*	25	LGT:525 Hansol:250 KTF:02180
*	26	LGT:02190 Hansol:02218 KTF:00022
*		LGT:00000 Hansol:00070 END

8. PCS TEST Guide

<Before Test>

- HP8924C Calibration

  1) PCB Cal

  This should be done about once in a month, and when displayed values are so strange.

  1 After power up, wait for warm-up about 30 minutes.
  2 Press the TESTS key.
  3 Select ROM from the list of choices for the Select Procedure Location field. (It would be remained after you choose once.)
  4 Select PCB_CAL from the list of choices for the Select Procedure Filename field.
  5 Position the cursor next to the Run Test field(or Press the K1 key).
  6 Remove the all front-panel cables while beeped.
  7 After closing of all calibration procedure, cycle power. If don't, the device would not work well.

  2) RF Generator Cal

  This should be done after PCB CAL, or 30 minutes after power on.

  1 Press the shift + TESTS key, to display the CONFIGURE screen.
  2 Position the cursor at the RF Gen Lvl field.
  3 Press the knob. It takes about 15 seconds.

  3) Zeroing Average Power Measurement

  1 Remove any cable on the RF IN/OUT connector.
  2 Set the Sector A Pwr off.
  3 Select the Average Power Measurement. It can be done by select Avg Power at any power fields.
  4 Position the cursor at Power Meas field (it signs "Zero") in Call Control screen and press the knob. It takes about 2 seconds.

  4) Channel Power Calibration

  1 Connect the RF IN/OUT and RF Out Only connectors with low loss cable.
  2 Select the Channel Power Measurement.
  3 Position the cursor at Power Meas field (it signs "Calibrate") in Call Control screen and press the knob. It takes about 5 minutes.

- Making a Call

  It is normal that all of the items in J-STD-018 are tested with Service Option 2 call (loopback mode). Before making a call, the followings may be set:

  - Protocol : J-STD-018
  - Rf Chan Std : US PCS
  - Traffic Data mode (Svc Opt 2, as usual)
  - System ID
  - Channel Number

  1 Wait for ESN is shown or Push the knob to select the Register field.
  2 After ESN is read, check if the letter 'IDL' is on the LCD panel of the UUT, and then press the CALL key to make a call.

  ✧ When the call is not made, check the followings :

  - if Sct A Pwr is too low, or too high.
  - if the System ID is suited with input PRL.
  - if 'Always Down' or 'Always Up' is selected in the "Power Range Test" screen.
  - if the UUT is shielded well (rarely it could be power-off when there is any interference).

- SID Check

  To see the SID of phone, some methods can be used.

  - Press 'FCN+ "0" + "0" + "*" + "*" + "8" + "3" + "7" + "8" + "6" + "6" + "3" + "3" + STO' keys in order, and input '5509#'. Change the value "00000100" to "11100000", and input '01#', then you can see the Call Status screen. There is a 4 bit number, SID, in bottum line 2nd from the left.
  - If you have 'CDMA Support Studio', you can check PRL and SID with that.

8.1 Rx Test

1. Demodulation of Forward Traffic Channel in Additive White Gaussian Noise(AWGN)
   1 Connect the UUT and HP8924C, and make a Svc Opt 2 call.
   2 Set the parameters in HP8924C :
   Sct A Pwr = -75 dBm, AWGN = -74 dBm, Pilot = -7dB

	Data Rate	Traffic(dB)	FER Spec
1	9600bps(Full)	-16.3 (Eb/Nt=3.8)	3%
2		-15.8 (Eb/Nt=4.3)	1%
3		-15.6 (Eb/Nt=4.5)	0.5%
4	4800bps(Half)	-19.1 (Eb/Nt=4.0)	1%
5	2400bps(Quarter)	-21.6 (Eb/Nt=4.5)	1%
6	1200bps(Eighth)	-24.5 (Eb/Nt=4.6)	1%

   3 Measure the FER at Rx Test screen.

2. Receiver Sensitivity & Dynamic Range
   1 Connect the UUT and HP8924C, and make a Svc Opt 2 call.
   2 Set the Traffic level –15.6 dB.
   3 Reduce the Sct A Pwr and measure FER until over 0.5%. It's passed if the power at 0.5% FER is under –104dBm.
   4 Raise the Sct A Pwr and measure FER until over 0.5%. It's passed if the power at 0.5% FER is over –25dBm.

8.2 Tx Test

1. Waveform Quality, Frequency Accuracy & Time Accuracy
   1 Connect the UUT and HP8924C, and make a Svc Opt 2 call.
   2 Set the Sct A Pwr –75 dBm, Traffic level –7.4 dB.
   3 Display the Tx Test screen, and push the knob on ARM field. Read Rho, Frequency Error and Time Accuracy. (Time Accuracy field is subfield of Frequency Error.) Pass for each of parameters are satisfied the spec : >0.944, <±150Hz, <±1.00 us.

2. Range of Open Loop Output Power
   1 Connect the UUT and HP8924C, and make a Svc Opt 2 call.
   2 Set the Traffic level –7.4dB.
   3 Press the shift+RX TEST key to display the Power Range Test screen, and select 'Open Loop' at Closed Loop Pwr Ctrl field.
   4 Change the Sct A Pwr –25dBm, -65dBm, -104dBm in orderly, and read the Chan Pwr or Avg Pwr. Check if the value is in the range below.
   5 Spec :

Sct A Pwr	Spec
-25dBm	-60.5~-41.5 dBm
-65dBm	-20.5~-1.5 dBm
-104dBm	15~27 dBm

3. Maximum RF Output Power
   1 Connect the UUT and HP8924C, and make a Svc Opt 2 call.

2 Press shift+Call Ctrl key to display Cell Configuration screen, and change the parameters as below :

Parameters	Changed value	Default value
Nom Pwr	7	0
Init Pwr	15	0
Power Step	7	0
Num Step	15	5
Max Req Seq Max Rsp Seq	15	1

3 Set the Traffic level –7.4dB.
4 Set the Sct A Pwr –104dB.
5 Press shift+RX TEST key to open the Range screen, and select 'Always Up' in Closed Loop Pwr Ctrl field.
6 Set the Drop Timer "OFF".
7 Read the Average Power. Check it is over +23dBm.

4. Minimum Controlled Output Power
1 Connect the UUT and HP8924C, and make a Svc Opt 2 call.
2 Set the Sct A Pwr –25dBm.
3 Press shift+RX TEST key to open the Range screen, and select 'Always Down' in Closed Loop Pwr Ctrl field.
4 Read the Channel Power. Check it is under –50dBm.

9 Troubleshooting

9.1 RF Part

9.1.1 TX Part

Symptom	Probable Cause	Verification and Remedy

Low transmit power respect to ideal power	a) Low Tx IF level	1. Test command # + 271 + 12127 2. VCA Voltage (R11654) should be 1.05~1.03 V 3. IF level at C10173 should be -13dBm ~ -17dBm 4. Or CDMA Power Phase .
	b) Low Tx local level	1. The level at ME2 pin 3 should be over -16 dBm 2. check U626, Main VCO: 2.75V at pin 4, 0.6~1.7 V at pin 1 are reasonabe 3. Or check R705, R602or replace U626
	c) ME2 supply voltage problem.	1. ME2 IC 2,6,8,10,11,12,17,18,19pin should be 2.75V loaded other then check TX_2.75 and RF_2.75 or replace ME2 IC 2. Test command # + 271 + 12127 Pin 5,9 pin voltage should be 1.2V ~ 1.5V same each other or check R413, R414, R407, R408 then replace ME2 IC 3. .Check Exciter max power out, then power out at C412 should be over 3dBm
	d) Problem at Power Amp	1. After PA Finaldriver phasing, PA currentshould be in 110~140mA or replace PA 2. PA pin 1,2,8 voltage should be in -0.4~-1.3 V 3. PA pin 4,5,6,7voltage should be same with B+, or check Q1905, pin 1,2,3and pin 5,6,7,8 voltage should be same and pin 4 voltage should be 20mV 4. Check PA Gain and output Remove U475 and check the max power out , the power out should be over 28.5dBm
	e) Problem at Ant S/W	1. When tested with Butt plug, pin 4, Ant pin 6 voltage at U75 should be 4.75V, two pin volgate is togle 2. Or replace U75
Disable Tx power transmit	a) unlock Tx offset VCO	1, Test command # + 05 2. TX Offset VCO lock voltage check R651 voltage should be over 1V and lock frequency should be 317.1MHz 3. Or AFC wrap phasing
	b) Problem at Main VCO	1. Refer to Lowtx transmit power b)
	c) Problem at TCXO	1. At U325 pin 4voltage should be 2.75V 2. pin 3 ouput frequency should be 16.8Mhz Sine wave 3. Then AFC warp phasing or replace U325
Disable modulation when test mode 27#	a) Problem at ZIF/SYN supply	1. U700, pin L7 voltage should be 2.75 V 2. Then TX_2.75 Power supply line up check like Q2501

	b) Problem TX_I, Q Signal	1. check I and Q signal at R730 and R731, the signal should be modulated 2. If the carror is shown in spreading sinal , check around the R730, R731, R732

9.1-2 RX Part

Receiver line-up check points
Step 1. Open the phone and shield can as followings;

- Front-end block : LNA, PIN diode attenuator and Combo Filter
- Back-end block : Mixer, IF SAW Filter and IF AMP
- VCO block
- ZIF/SYN IC block

Step 2. Visually inspect whole receiver line-up

Step 3. Set-up the “Test Mode”

Step 4. Check and record the bias on the antenna switch (U75) using DMM

Check Point	Recommended Value
Pin # 1	3.56 Vdc
Pin # 3	3.56 Vdc
Pin # 4	0.00 Vdc
Pin # 5	3.56 Vdc
Pin # 6	3.56 Vdc

Attention!
In case of 50 Ohm terminated at accessory connector, Pin # 4 shows 3.56 Vdc and Pin # 6 indicate 0.00 Vdc.

Step 5. Check and record the bias on the each block using DMM

Check Point	Position	Recommended Value
LNA (Q100)	Pin # 1 (Base Port)	0.88 Vdc
LNA (Q100)	Pin # 3 (Collector Port)	1.2 Vdc
Mixer (Q1906)	Pin # 1 (Base Port)	1.1 Vdc
Mixer (Q1906)	Pin # 2 (Emitter Port)	0.4 Vdc
Mixer (Q1906)	Pin # 3 (Collector Port)	2.75 Vdc
IF AMP (Q1901)	Pin # 1 (Base Port)	0.76 Vdc
IF AMP (Q1901)	Pin # 3 (Collector Port)	0.78 Vdc
ZIF/SYN IC (U700)	C750 (ZIF_2.75V Port)	2.75 Vdc
ZIF/SYN IC (U700)	C756 (ZIF_2.75V Port)	2.75 Vdc
ZIF/SYN IC (U700)	C778 (ZIF_2.75V Port)	2.75 Vdc
ZIF/SYN IC (U700)	C785 (ZIF_2.75V Port)	2.75 Vdc
ZIF/SYN IC (U700)	R700 (ZIF_2.75V Port)	2.75 Vdc
ZIF/SYN IC (U700)	R703 (ZIF_2.75V Port)	2.75 Vdc
ZIF/SYN IC (U700)	R706 (ZIF_2.75V Port)	2.75 Vdc
ZIF/SYN IC (U700)	R728 (ZIF_2.75V Port)	2.75 Vdc

Step 6. Check and record the locking voltage on the Main VCO and Rx 2nd LO using DMM

Check Point	Position	Recommended Value
Main VCO (U626)	Between R602 & C601	0.8 ~ 1.8 Vdc
Rx 2nd LO	Between R301 & C301	0.8 ~ 1.8 Vdc

Attention!
In case of Main VCO, the locking voltage shows a little bit different value on the assigned channel.
Especially if that one was measured under 0.5 Vdc and/or over 2.5 Vdc, please replace the Main VCO.
In case of the Rx 2nd LO, the locking voltage shows constant value at any assigned channel.

Step 7. Check and record the output power level on the Main VCO and Rx 2nd LO using Spectrum Analyzer w/ FET Probe

Check Point	Position	Recommended Value
Main VCO (U626)	Between L200 & C10218	-5 dBm
Rx 2nd LO	Between C304 & C305	-9 ~ -10 dBm

Step 8. Check and record the input/output power level on the each block using Spectrum Analyzer w/ FET Probe

☐*Connect the signal source (CDMA and/or CW) using 8924C and/or at the accessory connector and then adjust power level as –30dBm/BW*☐

Check Point	Position	Recommended Value
LNA (input)	C101	-34 dBm/BW
LNA (output)	C107	-20 dBm/BW
Mixer (input)	Between L200 & C10218	-22 dBm/BW
Mixer (output)*	Between L2028 & L2033	-2 dBm/BW
IF SAW Filter (output)	Between L2027 & R13227	-9 dBm/BW
IF AMP (output)	C10173	+2 dBm/BW

Attention!
From this star mark, have to adjust center frequency as 238.55 MHz.
"The tolerance of the FET Probe : 2~3 dB"

9.2 A/L Part

9.2.1 A/L Part

Symptom	Probable Cause	Verification and Remedy
The phone is not turned on	a) Battery Discharged	1) Measure battery voltage across a 50 ohm (>1 Watt) load. 2) If the battery voltage is <3.4 V DC, recharge the battery using the appropriate battery charger.
	b) Battery defective.	1) If the charging is failed or charged voltage is <3.4 V DC, replace the battery with a known good part.
	c)Battery connector open or misaligned.	1) Visually inspect the battery connectors on both the battery pack and the transceiver, including the solder connections from the battery connector to the main PC board. 2) Realign the contacts or, if necessary, replace either the battery or battery connector.
	d) Connection and Soldering Condition	1) Check the connection and soldering condition of all the Connectors J101 (Board-to-Board Connector), J1000 (Flex Connector), J5000 (Internal MIC Connector), J1 (Accessory Connector) 2) Check the soldering and mounting condition of the all the component visually 3) If the failed connector or components are found, replace and re-solder them.
	e) Power Supply defective	1) Apply the power through the battery. 2) Depress the **PWR** button 3) Check the B+ voltage by measuring 3.4-4.2V at the pin 43 of U2000 GCAP. 4) If the B+ doesn't come out, replace the U1000 or Q1008. 5) Check the Logic 4.75 voltage by measuring 4.75V at the pin 41 of U2000 GCAP. 6) Check the Logic 2.75 voltage by measuring 2.75V at the pin 28 of U2000 GCAP. 7) Check the Audio 2.75 voltage by measuring 2.75V at the pin 21 of U2000 GCAP. 8) If Logic 2.75 or Audio 2.75 level is 'Low', proceed to h)-2) and check the 5), 6), 7) again. 9) If Logic 2.75 or Audio 2.75 level is 'Low' still, replace the U2000 GCAP or check the power line.

f) Display board or Keypad membrane defective	1) Replace the keypad membrane with a known good part. 2) Temporarily connect +4.2 V DC to the battery contacts. 3) Depress the **PWR** button; if unit turns on and stays on, disconnect the power source and reassemble the phone with the new keypad membrane 4) Replace keypad board assembly with a known good assembly. 5) Temporarily connect +4.2 V DC to the battery contacts. 6) Depress the **PWR** button. If the units turns on and stays on, disconnect the power source and reassemble the phone with the new Display board assembly.
g) Reset/ Clock Fail	1) Check the RESETB Signal from GCAP by measuring the voltage of R1718. - Depress **PWR** button, then the RESETB signal maintain 'Low' for approximately 255msec after power on and goes to 'High' 2) Check the 16.8MHz reference clock by measuring the signal via C1925. 3) If 16.8MHz clock is not probed, check the reference oscillator part of RF side. 4) Check the Clock from the CIA as below - CLK0 : 5.6Mhz CRIB input clock (measured via R1794) - CLK2: 32.749khz MCU input clock (measured via R1792) - CLK3: 1.12Mhz DSP input clock (measured via TP1913) - CHIPx8: 9.8304Mhz Chipx8 clock (measured via TP1711) 5) Check the 32.768khz crystal clock by measuring the CLK32X signal via TP1711
h) Watchdog Fail	1) Check watchdog level from CRIB to GCAP by measuring the WDI level via R13223. - Depress **PWR** button, then the WDI signal maintain 'Low' for approximately 270~280 msec after power on and goes to 'High' 2) Take off the R13223 0Ohm resister and put the 1kOhm resister to the R2008 DNP place and check if the phone operate normally.
i) Phone Mode Fail	1) Check the manual test line via R1707. 2) If the manual test line is 'Low', the phone will go to flash mode and if 'High', the phone will go to the normal turn on sequence.

	j) Board defective.	1) Remove the RF/AL Board and Substitute a known good board. 2) Temporarily connect +4.2 V DC to the battery contacts. 3) Depress the **PWR** button; if unit turns on and stays on, disconnect the power source and reassemble the phone with the new RF/AL board and re-test phone.
No Display	a) Connection Failure	1) Disassemble the phone 2) Check the board to board Connection 3) If the connector defective is found, replace the 32 pin Connector.(Conn1 of Display board or J101 of RF/AL Board) 4) If the connection is not at fault, proceed to b)
	b) Display Module defective	1) Verify the electrical contact between the part of the Display board and the Can of the RF/AL board 2) Assemble the Display board to a known good RF/AL board, and check the function. 3) If the display fail is not solved, replace the Display board with new good Display board. 4) If not, proceed to c).
	c) RF/AL board defective	1) Assemble the RF/AL board to a known good Display board, and check the function. 2) If the display fail is not solved, check the RF/AL board Turn ON problem. 3) Proceed the phone Power up troubleshooting sequence 4) If the Failure not solved, Replace the RF/AL board with a new good RF/AL board.
Display is erratic or partial no display	a) Connection Failure	1) Disassemble the phone 2) Check the board to board Connection 3) If the connector defective is found, replace the 32 pin Connector.(Conn1 of Display board or J101 of RF/AL Board) 4) If the connection is not at fault, proceed to b)
	b) Display Module defective	1) Verify the electrical contact between the part of the Display board and the Can of the RF/AL board 2) Assemble the Display board to a known good RF/AL board, and check the function. 3) If the display fail is not solved, replace the Display board with new good Display board. 4) If not, proceed to c).
	c) RF/AL board defective	1) Assemble the RF/AL board to a known good Display board, and check the function. 2) If the display fail is not solved, check the RF/AL board. 3) Program the FLASH ROM again 4) If the Failure not solved, Replace the RF/AL board with a new good RF/AL board.
Keypad Backlight Failure	a) Connection failure	1) Disassemble the phone. 2) Check the board to board Connection 3) If the connector defective is found, replace the 32 pin Connector.(Conn1 of Display board or J101 of RF/AL Board) 4) If the connection is not at fault, proceed to b).

	b) Regulator defective	1) Supply the power by external connector or set the 'Backlight Always on' of 'Backlight Select' of 'Display Options' menu. 2) Check if there is a contact point between the can of RF/AL board and U1701 pin. 3) Verify that the 2.75 voltage is probed on the pin #3,6 of IC U1701 4) If 2.75 voltage output is not probed on #3,6 pin, replace the IC U1701. 5) If the problem is not solved, proceed to c)
	c) Keypad LED defective	1) Verify that the 2.75 voltage is probed on the BL_DRIVE Signal(pin 32 of CONN1) of Display board. 2) If some LEDs out of 6 LEDs have failure, replace the failed LED.
LCD Backlight Failure	a) Connection failure	1) Disassemble the phone. 2) Check the board to board Connection 3) If the connector defective is found, replace the 32 pin Connector.(Conn1 of Display board or J101 of RF/AL Board) 4) If the connection is not at fault, proceed to b).
	b) Regulator defective	1) Supply the power by external connector or set the 'Backlight Always on' of 'Backlight Select' of 'Display Options' menu. 2) Check if there is a contact point between the can of RF/AL board and U1701 pin. 3) Verify that the 2.75 voltage is probed on the pin #3,6 of IC U1701 4) If 2.75 voltage output is not probed on #3,6 pin, replace the IC U1701. 5) If the problem is not solved, proceed to c)
	c) LCD Backlight LED defective	1) Verify that the 2.75 voltage is probed on the BL_DRIVE Signal(pin 32 of CONN1) of Display board. 2) If BL_DRIVE Signal is normal, Replace the Display Module.
No sense when flip is opened and closed	a) Connection failure	1) Disassemble the phone. 2) Check the board to board Connection 3) If the connector defective is found, replace the 32 pin Connector.(Conn1 of Display board or J101 of RF/AL Board) 4) If the connection is not at fault, proceed to b).
	b) Reed S/W defective	1) Place a known good Magnet Flip on the Display board, and check the On/ Off sense. 2) If On/Off sense is good, proceed to c) 3) Verify that the 2.75 voltage is proved on the 'up' marking point of Reed Switch J101 when the flip is taken off from the Display board. 4) Verify that the 0 voltage is proved on the 'up' marking point of Reed Switch J101 when the flip is placed on the Display board. 5) If 3),4) operation is good, replace the Reed Switch

	c) Magnet defective	1) Disassemble the flip assembly. 2) Check whether the magnet is assembled well. If not, put and assemble the magnet into good position. 3) If the failure is not solved, Replace the Magnet Flip with a good Magnet Flip.
Over Current	a) Bad Contact / Solder	1) Check whether CR2108 diode has gone. 2) Check the connection and soldering condition of all the Connectors J101 (Board-to-Board Connector), J1000 (Flex Connector), J5000 (Internal MIC Connector), J1 (Accessory Connector)
	b) Over Current through the Logic_2.75	1) Check the current through the Logic_2.75 ; GCAP U2000 pin 28 - Standby state average current : < 8 mA - Call state average current : < 50 mA (Full data rate, +7dBm Power) 2) If the current exceed to above value, investigate the consumption current of each part using the 0-Ω resistor. U1100 (MC68338) : R1101, U1200 (Flash ROM) : R1203 U1300 (SRAM) : R1300, U1400 (EEPROM) : R1400 U1600 (DSP56603) :R1603, U1700 (CRIB-IC) : R1701 U1900 (CIA_VDDD) : R1914
	c) Over Current through the Audio_2.75	1) Check the current through the Audio_2.75; GCAP U2000 pin 22 - Standby state average current : < 6 mA - Call state average current : < 80 mA (Full data rate, +7dBm Power) 2) If the current exceed to above value, investigate the consumption current of each part using the 0-Ω resistor. U1900 (CIA_VDDA) : R1915 Q2500 pin #3 (FE_2.75V) Q2501 pin #3(TX_2.75V) U402 pin #4(ZIF_2.75V)
	d) Over Current through the Power Amplifier	1) Check if there is no current drain of PA while standby state by probing the current through the Q1905 (PA supply gate) pin #5~8. 2) Check if the current through the Q1905 (PA supply gate) pin #5~8 is under the 180mA (Full rate, +7dBm)

Symptom	Probable Cause	Verification and Remedy
Vibrator will not operate.	a) Vibrator defective.	1.Enter [FCN] + [8]. The vibrator should operate when the display will be showed [Vibrate Only]. 2.If the vibrator will not operate, replace the vibrator.

	b) Flex PCB defective.	1. Open the flip rear cover and rear housing. 2. Visually inspect the solder connections on PCB. 3. Check the signal connection with DVM (<1ohm). ● J1000-9 to red wire of vibrator. ● J1000-12~16(GND) to blue wire of vibrator. 4. If the path is disconnected, replace the Flex PCB.
	c) Driver circuit defective.	1. Open the rear housing. 2. Visually inspect the solder connections on PCB. 3. Place the charged battery. 4. Turn on the phone. 5. Enter [FCN] + [8]. The measured output voltage of the drive circuit (J1000-9) should be 1.5Vdc nearby when the display will be showed [Vibrate Only]. 6. If the output will not measure, replace the Q1751 or Q1750.
Abnormal vibration	a) Misalliance of vibrator.	1.Open the flip rear cover. 2.Enter [FCN] + [8]. The vibrator should operate when the display will be showed [Vibrate Only]. 3.If the vibrator will operate abnormally, realign the vibrator or holding sponge.
	b) Vibrator defective.	1.Open the flip rear cover. 2.Enter [FCN] + [8]. The vibrator should operate when the display will be showed [Vibrate Only]. 3.If the vibrator will operate abnormally, replace the vibrator.
No speaker audio	a) Speaker defective.	1. Open the flip rear cover. 2. Inject the sweep signal to speaker terminals from a signal generator (3Vpp, 100Hz ~ 3kHz, Square wave). 3. If there is no sound, replace defective speaker.
	b) Flex PCB defective.	1. Open the flip rear cover and rear housing. 2. Visually inspect the solder connections on PCB. 4. Check the signal connection with DVM (<1ohm). ● J1000-7 to upper terminal of speaker. ● J1000-8 to lower terminal of speaker. 5. If the path is disconnected, replace the Flex PCB.

Transmit audio is weak, distorted, or dead.	a) Internal microphone defective.	1. Inject external power with MINI CHAP II. 2. Change the phone status to TEST MODE. 3. Enter the following commands: ● 575# ; to place CDMA call processing mode ● 57644# ; to place SIMVC mode ● 355# ; to select internal MIC path ● 474# ; to set receive audio volume to level 4 4. Supply a 1kHz, 94dBspl sound to the MIC. 5. Measure the output signal from external audio output terminal of MINI CHAP II. 6. The measured audio level must be within –17dBv (140mV) ± 5dB. 7. If the result is out of limits, Remove the rear and Front housing and replace defective microphone.
	b) Amplifier circuit defective	1. Remove the rear and front housing. 2. Remove a lower shield can from the logic side PCB. 3. Visually inspect the solder connections on PCB. 4. Remove the microphone 5. Connect the keypad with the extension cable. 6. Inject external power with MINI CHAP II. 7. Change the phone status to TEST MODE. 8. Enter the following commands: ● 575# ; to place CDMA call processing mode ● 57644# ; to place SIMVC mode ● 355# ; to select internal MIC path ● 474# ; to set receive audio volume to level 4 9. Inject the signal to microphone socket from a signal generator (10mV, 1kHz, sinewave). 10. Measure the output signal of amplifier at C1908 (or R1907) connected with U1900. 11. The measured output must be within -20.5dBv(95mV) ± 3dB without distortion. 12. If the result is out of limits, replace the relative components including U1900.
Receive audio is Weak , distorted And/or howling `	a) Inadequate volume setting	Adjust the volume step to level 3 or 4 in conversation state.
	b) speaker defective	1. Open the flip rear cover. 2. Inject the sweep signal to speaker terminals from a signal generator (3Vpp, 100Hz ~ 3kHz, Square wave). 3. If there is some distorted sound, replace defective speaker.

	c) Amplifier circuit defective	1. Remove the rear and front housing. 2. Remove a lower shield can from the logic side PCB. 3. Visually inspect the solder connections on PCB. 4. Connect the keypad with the extension cable. 5. Inject external power with MINI CHAP II. 6. Change the phone status to TEST MODE. 7. Enter the following commands: ● 575# ; to place CDMA call processing mode ● 57644# ; to place SIMVC mode ● 351# ; to select internal speaker path ● 474# ; to set receive audio volume to level 4 8. Inject a 1kHz, 100mVrms signal to the external audio_in pin through the MINI CHAP II. 9. Measure the output signal of amplifier at U2000-19 (or U2000-20). 10. If the output will not measure within -18dBv (125mV) ± 3dB, replace the relative components including U2000.
Alert ringer is distorted or too low	a) Ringer defective	1. Replace defective ringer(LS1).
	b) Amplifier circuit defective	1. Remove the rear and front housing. 2. Remove a lower shield can from the logic side PCB. 3. Visually inspect the solder connections on PCB. 4. Replace the CR2001 or U2000.
Headset audio is weak, distorted, or dead	a) Headset jack defective	1. Replace defective headset jack(J2000).
	b) Headset detection circuit defective	1. Remove the rear and front housing. 2. Remove a lower shield can from the logic side PCB. 3. Visually inspect the solder connections on PCB. 4. Inject external power with MINI CHAP II. 5. Measure the output signal of headset detection circuit (Q2509-3). 6. The measured output must be 0V (logical low) when the headset is connected. 7. If there is no response, replace the relative components including Q2000 & Q2509.

	c) Amplifier circuit defective	1.Remove the rear and front housing. 2.Remove a lower shield can from the logic side PCB. 3.Visually inspect the solder connections on PCB. 4. Connect the keypad with the extension cable. 5. Connect the test cable from signal generator to headset jack. 6.Inject external power with MINI CHAP II. 7.Change the phone status to TEST MODE. 8.Enter the following commands: ● 575# ; to place CDMA call processing mode ● 57644# ; to place SIMVC mode ● 359# ; to select boom MIC & SPK path ● 474# ; to set receive audio volume to level 4. 9.Inject a 1kHz, 10mVrms signal to headset jack. 10.If the measured output at C1909 (or R1910) connected with U1900 will not measure within -15.6dBv (167mV) ± 3dB, replace the relative components including U1900. 11. If the measured output at J2000-3 will not measure within –9.6dBv (330mV) ± 3dB, replace the relative components including U2000.

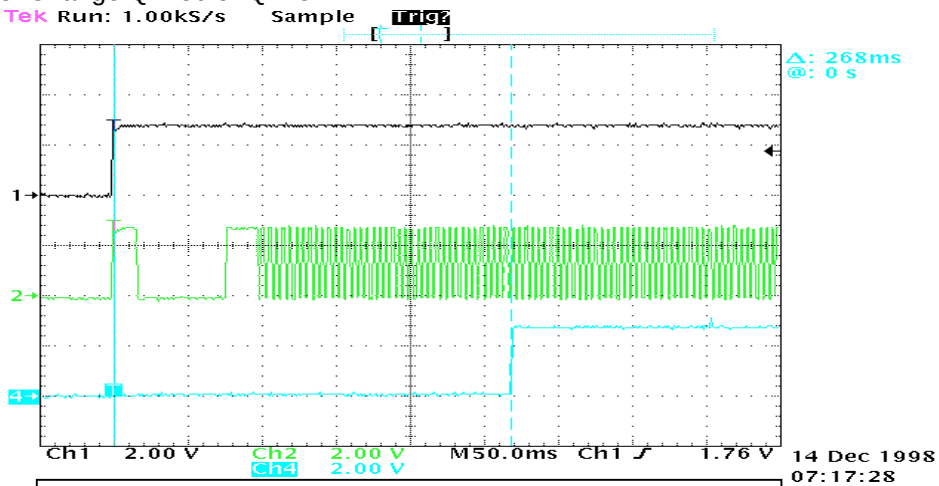
9.2.2 Power Part

9.2.2.1 Vibration When Powered Up

1. Reconnect flex cable

2. Check u-P (U1100), memory (U1200, U1300, U1400), 16.8MHz oscillator and RESETB

3. Change Q1750 or Q1751



CH1 : Logic_2.75, CH2 : 16.8MHz, CH4 : RESETB
RESETB is released after ~270ms of Logic_2.75

9.2.2.2 Not Power-Up

a) Battery either discharged or defective.
1. Measure battery voltage across a 50 ohm (>1 Watt) load.
2. If the battery voltage is <3.4 V DC, recharge the battery using the appropriate battery charger.
3. If the battery will not recharge, replace the battery.

b) Battery connector open or misaligned.
1. Visually inspect the battery connectors on both the battery pack and the transceiver, including the solder connections from the battery connector to the main PC board.
2. Realign the contacts or, if necessary, replace either the battery or battery connector.

c) Switch inside option connector is open.
1. Measure resistance across the two option connector solder connections on the RF side of the RF/Audio-Logic board.
2. If the switch measures open, replace the option connector.

d) Keypad membrane defective.
1. Replace the keypad membrane with a known good part.
2. Connect +4.2 V DC to the battery contacts.
3. Depress the **PWR** button; if unit turns on and stays on, disconnect the power source and reassemble the phone with the new keypad membrane.

e) Keypad board defective.
1. Replace keypad board assembly with a known good assembly.
2. Connect +4.2 V DC to the battery contacts. Depress the **PWR** button.
3. If the units turns on and stays on, disconnect the power source and reassemble the phone with the new keypad board assembly.

f) RF/Audio-Logic Board defective.
1. Remove the RF/Audio-Logic Board. Substitute a known good board.
2. Connect +4.2 V DC to the battery contacts.
3. Depress the **PWR** button; if unit turns on and stays on, disconnect the power source and reassemble the phone with the new RF/Audio-Logic board and re-test phone.

f) Components defective
1. Change Q1008 or Q1004 when B+ isn't high
2. Change L2000 when BOOST is low.
3. Change U2000 when Logic_2.75 and Aud_2.75 is low, and WDI is high on power up.
4. Check 16.8MHz if Logic_2.75 and Aud_2.75 is high.
5. Check u-P(U1100) and memory(U1200, U1300, U1400) if WDI is low

9.2.2.3 Power Off When Key Pressed

a) Spacer defective

1. Check if the components under the key pad are short to shield can when key pressed.
2. Replace spacer

b) Shield defective

1. Check if two shield can are short to components inside of shield when shield is pressed.
2. Replace shield

9.2.2.4 Power Off On Standby

a) Battery either discharged or defective.

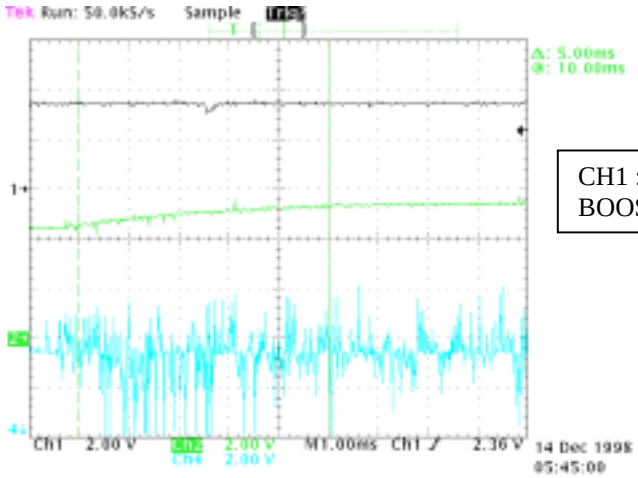
1. Measure battery voltage across a 50 ohm (>1 Watt) load.
2. If the battery voltage is <3.4 V DC,
   recharge the battery using the appropriate battery charger.
3. If the battery will not recharge, replace the battery.

b) Accessory defective

1. Check if IGN line of DHFA is connected to car battery.
2. Check if the EXT_B+ voltage is above 5.7V during charging.

c) Components defective

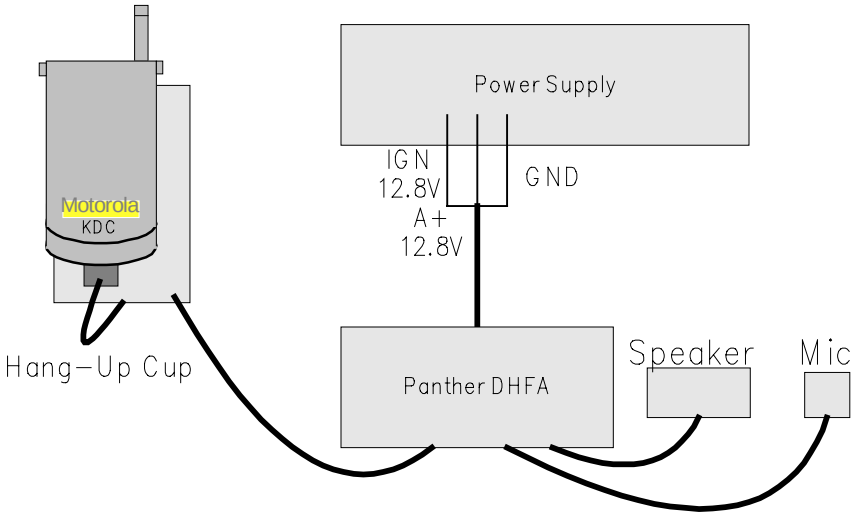
1. Change Q1008 or Q1004 when B+ isn't high
2. Change L2000 when BOOST is low.



CH1 : B+, CH2 : BOOST, CH4 : LX
BOOST voltage rise to 5V after 10ms

3. Change U2000 when Logic_2.75 and Aud_2.75 is low, and WDI is high on power up.
4. Check 16.8MHz if Logic_2.75 and Aud_2.75 is high.
5. Check solder state of u-P(U1100) and memory(U1200, U1300, U1400) if WDI is low

9.2.2.5 Power Off When Using Option



1. Upgrade the latest s/w version if the problem occurs on call state
2. Check if car battery gets off (only in case of DHFA)
3. Check if the EXT_B+ voltage is above 5.7V during charging.
4. Check if DHFA, CLA and other option is working well

9.2.2.6 Not Working Except Backlight On When Powered Up

- Check u-P, memory, 16.8MHz oscillator and RESETB

9.2.2.7 Power On And Off Repeatedly

-. Change Q2505, Q2506, and then check where over-current occurs
-. Upgrade the latest s/w version if the problem occurs on call state

9.2.2.8 Battery Contact Fault

a) Battery connector open or misaligned.

1. Visually inspect the battery connectors on both the battery pack and the transceiver, including the solder connections from the battery connector to the main PC board.
2. Realign the contacts or, if necessary, replace either the battery or battery connector.
3. Change battery or front housing

b) Flex cable connector is open.

1. Measure resistance across the flex connector on the side of the RF board.
2. If the connector measures open, replace the flex connector.

9.2.2.9 Power Button Fault On Keypad

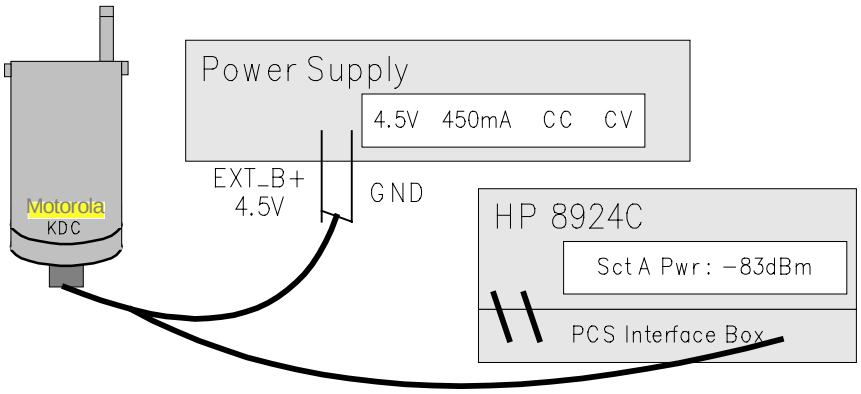
1. Replace keypad board assembly with a known good assembly.
2. Connect +4.2 V DC to the battery contacts. Depress the **PWR** button.
3. If the units turns on and stays on, disconnect the power source and reassemble the phone with the new keypad board assembly.

9.2.2.10 Power Down On 'SND'

a) Battery either discharged or defective.

1. Measure battery voltage across a 50 ohm (>1 Watt) load.
2. If the battery voltage is <3.4 V DC, recharge the battery using the appropriate battery charger.
3. If the battery will not recharge, replace the battery.

b) PA defective

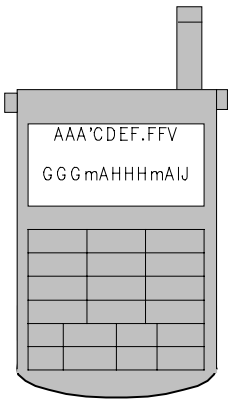


1. Setup the power supply; Out voltage :4.5V, Current limit : 450mA
2. Setup the HP8924; Sectr A Pwr : -83dBm, Data rate : random rate
3. Check current drain of phone at call state. Does power supply display ‘CC’ ?
4. Check if the bias point(PA_VGG1) of PA is -1.3V~-3V
5. Do Phasing

9.2.2.11 Hands Free Not Working

1. Check IGN line of DHFA (only in case of DHFA)
2. Check if the voltage range on 'Manual_Test' is 2.08~2.14V on uncradled state
3. Check if the voltage range on 'Manual_Test' is 0.589~0.683V
   on cradled state or Zero-install
4. Change the resistor of DHFA or Zero-install to 3.3k(5%) on uncradle,
   33.2k(1%) on cradle and 3k(1%) on Zero-install
6. Change the resistor (R1703) on 'Manual_Test' to 10k

9.2.2.12 Battery Getting Warm (Ni-Cd Or Ni-MH Only)



1. Push the button 'FCN'+'0'+'0'+'*'+'*'+'3'+'3'+'7'+'8'+'6'+'6'+'3'+'3'+'STO' and set into test mode.
2. Store 11000000 at 5509# and press 01# sequentially to restart phone.
3. Push the button 'FCN' twice and select the 'Battery Status Mode On'
4. Now you can see the battery voltage.
5. Check if the difference between that voltage displayed on LCD and real voltage of battery measured by DMM.
6. Do phasing if the difference is more than 200mV

9.2.2.13 Battery defective

a) battery cannot be charged.

1. Push the button 'FCN'+'0'+'0'+'*'+'*'+'3'+'3'+'7'+'8'+'6'+'6'+'3'+'3'+'STO' and set into test mode.
2. Store 11000000 at 5509# and press 01# sequentially to restart phone.

3. Push the button 'FCN' twice and select the 'Battery Status Mode On'
4. You can see following message on LCD

AAA'CDEF.FFV
GGGmAHHHmAIJ

Where: AAA = Average battery temperature
'C = Unit of temperature
D = 0:charger is off
1:charger is on for main battery
2:charger is on for aux battery
3:charger is off and main battery is active
4:charger is off and aux battery is active
E = F:fast charger
S:Mid rate charger(slow charger)
F.FFV = (Temperature compensated)average battery voltage
GGG = Ideal (non phased) charger current in mA
HHH = Actual (calculated) charger current in mA
I = Charger algorithm state
0 : Destroyed
1 : Battery detects
2 : No charge
3 : Rapid charge
4 : Top off charge
5 : Maintenance charge
6 : Paused
J = L : Lithum Ion battery
N : Nickel Battery
U : Unknown Battery

5. If the voltage of battery is about 1.4V, this indicates bad contact of the Battery to the phone or Flex Cable.
6. If 'J' indicates 'U', this is the case that phone doesn't recognize Battery Type(Lithium or NiMH).
7. In this case, plug the phone into charger base and check the left node of R1125 whether the bit stream occurs when battery is attached.
8. If not, check the soldering state. And if the temperature of the battery is -40'C, check the thermistor node of the Battery whether bad contact occurs or not and then check the soldering state of R1011.

b) battery cannot be charged insufficiently,

9. check whether the voltage of the #4 pin of Accessory Connector is equal to the voltage of the battery, and the voltage of #14 pin of the Accessory Connector is higher than the voltage of the Battery by 1.4V.
10. If not, change Q1000.
11. Measure the voltage of the R1004 and calculate the current through the resistor(=V/0.24) and compare that value to the displayed value.
12. If there is a difference, check R1004, the voltage of #17 pin of U2000 between 1.2 to 2.8V and Q1004 works well.
13. If there is no problem in the above check, check the charger base and adapter.

Written By YoungMiKoo
Modified By Silvester Lee

9.2.3 Power up Sequence For ST7762

1) Power is applied through the accessory connector or the battery
   ➔ Power-on button, Mort-On-Off(test board), Pin 24 of U2000
2) External or Battery is then routed to +B VCC.
3) +B VCC is then applied to U2000 (GCAP).
   -> Alert, vibrator, etc.
4) A boost voltage is developed of 5.0 volts.
5) Logic 4.75 is then developed.(U2000:41, U2000:3)
6) Logic 2.75 is then developed.(U2000:28)
   -> Logic 2.75 feeds all Logic ICs
   (338 UP, DSP, CRIB, CIA_VDDD, SRAM, FLASH, EEPROM, LED, miscellaneous circuits)
7) Aud 2.75 is then developed.(U2000:22)
   -> Aud 2.75 supplies the following regulators.
   -> RF 2.75, ZIF 2.75, FE 2.75, TX 2.75, CIA_VDDA, microphone, etc.
8) U325 starts the 16.8MHz clock, which is fed to the logic side.
9) 16.8 MHz clock is fed to U1900 via C1925(C328 is parallel to the path)
10) U1900 makes the clock for logic ICs.
   - RIB+ clock (CLK0: CIA) -> 16.8 MHz/3 -> R1794
   - CPU clock (CLK2: CIA) 32k -> 13.1 MHz
   R1922 (DNP), R1792
   - DSP clock (CLK3: CIA) 1.2 MHz-> 57.1 MHz -> TP1913
   - CRIB clock (CHIPX8: CIA) -> 9.824 MHz -> TP1710
11) Approx. 255 ms after power is first applied U2000 allows RESETB to go high.
12) With power, clock and resetb to U1100 wakes the UP.
13) The first thing the UP does is load a boot code from U1200 (flash rom).
14) Boot code does following.
   UP access the SRAM (U1300)
   UP access the CRIB (U1700)
   UP initializes the three-wire bus.
   UP via U1700 checks manual test line.
   If manual test line is low, radio set uP in flash mode
   If manual test line is high, radio continues with normal turn on sequence.
15) Main code is being used.
16) UP initializes EEPROM.
17) The following is done through the SPI line.
   If first turn on, all zero will be written to EEPROM.
18) UP initializes the U1900(CIA)
19) DSP clock & DSP reset are initialized.
20) UP initializes U700 ZIF/SYN via CIA (SYN part).
   Checkpoint: VSF voltage
21) UP downloads code to U1600 (DSP).
22) DSP becomes initialized and start running its code.
23) DSP initializes SSI BUS to the CIA
24) DSP initializes the DSP SPI BUS.
25) DSP hand shakes to the CIA, UP, CRIB.
26) UP initializes U700 ZIF/SYN via CIA.(ZIF part)
27) UP initializes U1700 CRIB(CSP part)
28) UP initializes U1700 CRIB(RIB part, three wire bus)
29) UP initializes display coprocessor via CRIB.
30) BackLights come UP.

10. ASSEMBLY / DISASSEMBLY PROCEDURE

Important Note

- When disassembling the antenna, extract the antenna about half way before insert the antenna tip into the vertical slot in antenna tool
- Be careful not to scratch or stress the plastic when disassembling the housings. Be extra careful with the liquid crystal display.
- For overall disassembly, refer to the photo in section seven of this manual.

Tool Preparation

- Antenna screw (Part Number: SYN5233A)
- Torque Driver (1.3kgf cm)
- StarTac Disassembly Fixture (Part Number: 8185677G01)
- Assembly Tool (Part Number: SYN5376A)
- Tweezers

1. Disassembly of Antenna

1-1. Turn off the power
1-2. Remove battery

1-3. Remove antenna using antenna screw

- Before unscrewing antenna, make sure to align the straight indent that exists on the top flat surface of bushing with rib-like protrusion on the tip of antenna screw.
- When using the antenna screw for assembly, make sure to set torque gauge at 1.3kgf cm.

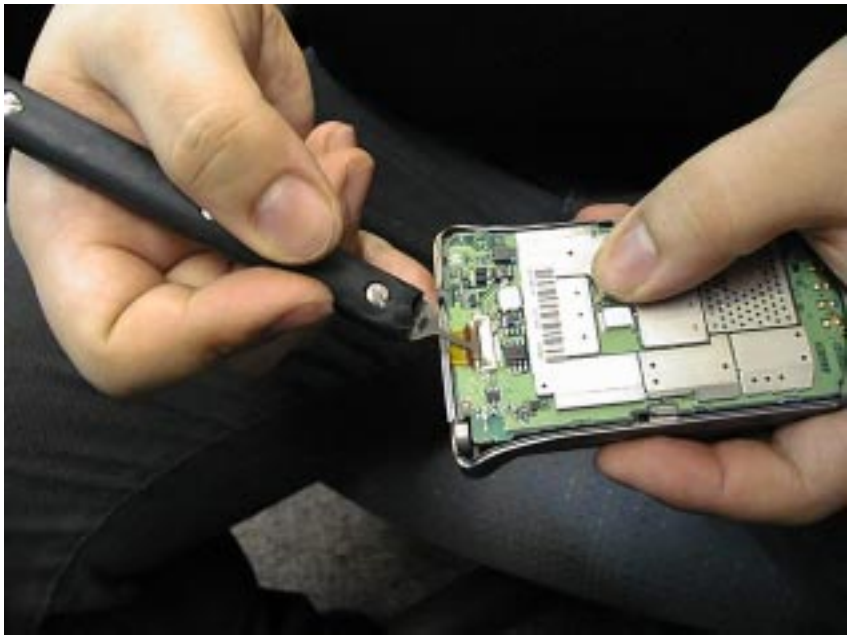
2. Disassembly of Rear Housing

2-1. With flip facing down, insert radio into StarTac disassembly fixture (part number: 8185677G).
2-2. Carefully disassemble rear housing by following operation sequence written on the base of fixture.
2-3. Do not force any step of the operation and be careful not to scratch the housing.

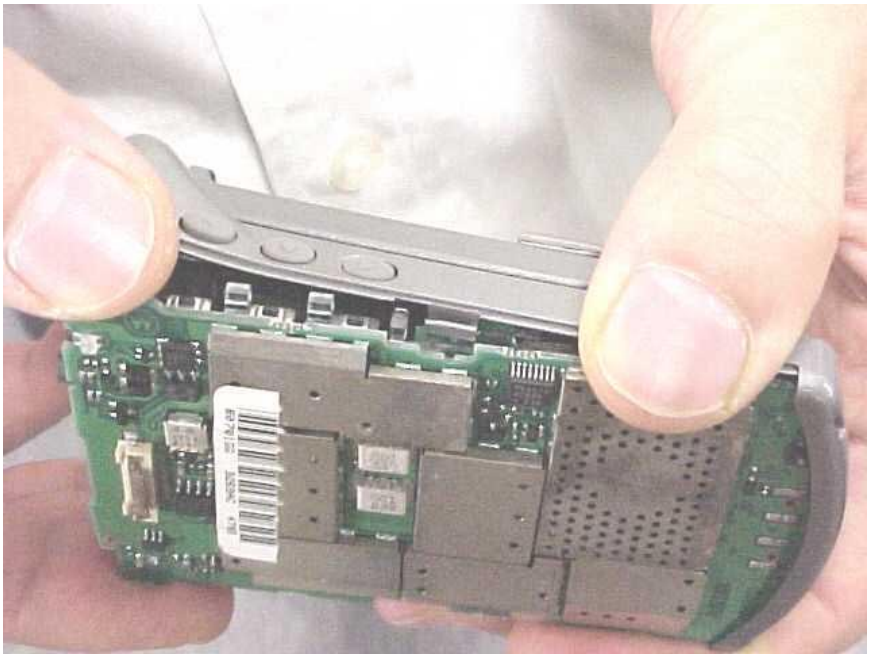
3. Disassembly of PC Boards

3-1. After removing rear housing lift up the brown tab on top of flex connector using an assembly tool.

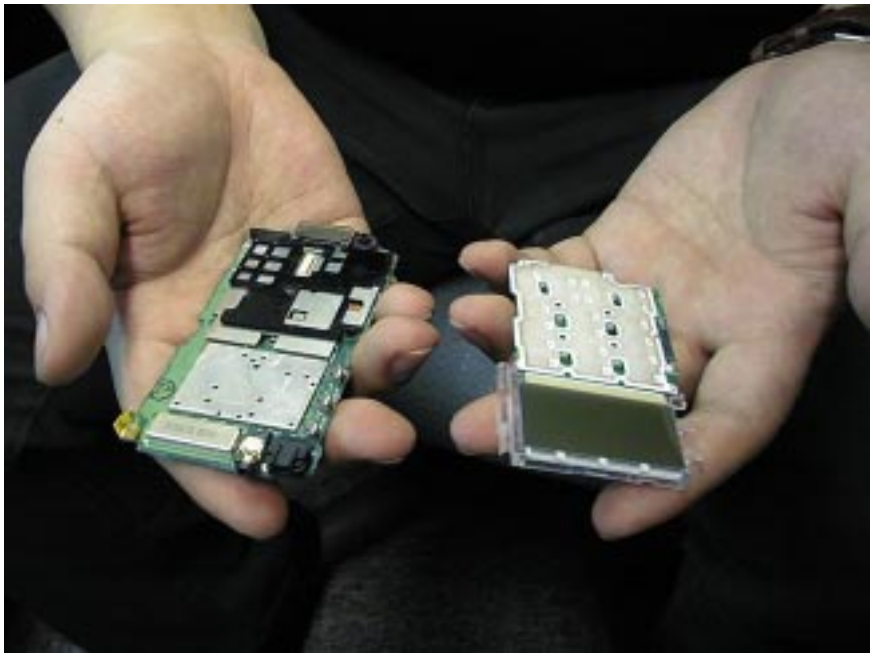
3-2. Remove flex cable from the flex connector by slowly pulling it.



3-3. Carefully remove PC Boards by first lifting up the top edge as shown in the picture below.



3-4. Disassemble PC boards into RF/AL and Display Boards by carefully pulling one against another.

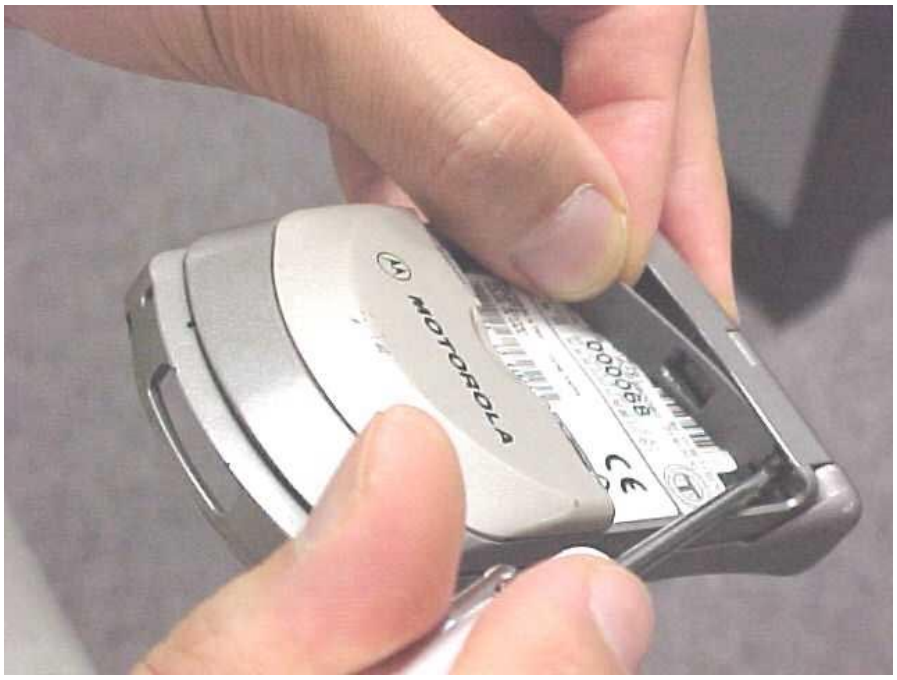


4. Layout of PC Boards and Plastic Parts

5. Disassembly of Flip

5-1. Remove the loose end of right shaft by inserting a tweezers in the middle section and lifting it away from the attached surface.

5-2. With flip closed, push on the small tab that maintains right shaft locked into the flip using a tweezers, while pulling the loose end of right shaft toward left.



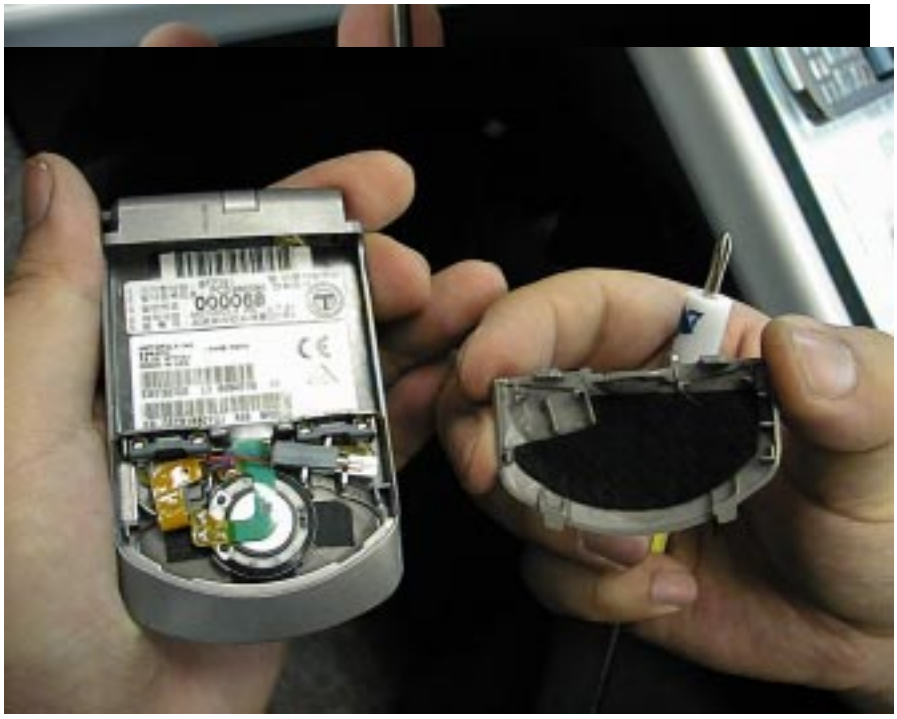
5-3. After removing right shaft, open the flip, lift up the right end, and pull toward the right to remove flip assembly from front housing.

6. Disassembly of Flip Cover

6-1. Insert the tip of an assembly tool between flip cover and front flip as shown in the picture below.
6-2. Using leverage, push the handle of the pick away from flip cover to release snap between flip cover and front flip.

6-3. Unsnap the other side using similar method.

6-4. After unsnapping both sides, life up the flip cover and pull toward battery shell.



7. Complete Disassembly Layout

11 Schematic Diagram

12 Part List

REFERENCE	ITEM_NUMBER	COMPANY PART NO.	GEOMETRY	DESCRIPTION
A1	172	39-03883K01	s_cn3903883k01	ANTENNA
A3	18	00-DNP00396	s_a4209480e01	ANTENNA
A4	19	00-DNP00397	s_a4209038e01	ANTENNA
C50	128	21-13743N28	s_c0402	CAPN
C51	128	21-13743N28	s_c0402	CAPN
C52	128	21-13743N28	s_c0402	CAPN
C76	89	21-13740F36	s_c0603	CAPN
C77	90	21-13740F39	s_c0603	CAPN
C78	90	21-13740F39	s_c0603	CAPN
C101	134	21-13743N50	s_c0402	CAPN
C104	106	21-13743E20	s_c0603	CAPN, 0.1UF
C105	8	00-DNP00043	s_c0402	CAPN
C106	128	21-13743N28	s_c0402	CAPN, 0.1UF
C107	122	21-13743N09	s_c0402	CAPN
C203	137	21-13928A01	s_c0603	CAPN
C205	124	21-13743N13	s_c0402	CAPN
C206	135	21-13743N65	s_c0402	CAPN
C300	106	21-13743E20	s_c0603	CAPN, 0.1UF
C301	103	21-13743E07	s_c0603	CAPN, 330PF
C302	136	21-13743N67	s_c0402	CAPN, 10PF
C303	130	21-13743N34	s_c0402	CAPN, 39PF
C304	126	21-13743N19	s_c0402	CAPN, 2.7PF
C305	126	21-13743N19	s_c0402	CAPN, 4.7PF
C325	117	21-13743L41	s_c0402	CAPN
C326	119	21-13743M24	s_c0402	CAPN, 0.1UF
C327	146	23-11049A76	s_ctant0805	CAPP
C328	117	21-13743L41	s_c0402	CAPN
C350	127	21-13743N26	s_c0402	CAPN, 39PF
C351	127	21-13743N26	s_c0402	CAPN, 39PF
C403	146	23-11049A76	s_ctant0805	CAPP
C404	114	21-13743L17	s_c0402	CAPN
C405	128	21-13743N28	s_c0402	CAPN
C406	128	21-13743N28	s_c0402	CAPN
C407	8	00-DNP00043	s_c0402	CAPN, 0.010UF
C408	117	21-13743L41	s_c0402	CAPN, 39PF
C409	128	21-13743N28	s_c0402	CAPN, 39PF
C410	128	21-13743N28	s_c0402	CAPN
C411	117	21-13743L41	s_c0402	CAPN
C412	128	21-13743N28	s_c0402	CAPN
C413	134	21-13743N50	s_c0402	CAPN
C475	128	21-13743N28	s_c0402	CAPN
C476	106	21-13743E20	s_c0603	CAPN, 0.1UF
C477	128	21-13743N28	s_c0402	CAPN, 39PF
C478	86	21-09622N06	s_c0603	CAPN
C600	101	21-13743B23	s_c1206	CAPN, 0.33UF
C601	115	21-13743L27	s_c0402	CAPN, 0.010UF
C602	115	21-13743L27	s_c0402	CAPN, 330PF
C625	117	21-13743L41	s_c0402	CAPN, 0.010UF
C626	128	21-13743N28	s_c0402	CAPN, 39PF
C627	147	23-11049A89	s_ctanta_134x071	CAPP, 4.7UF
C628	128	21-13743N28	s_c0402	CAPN, 4.7PF
C629	122	21-13743N09	s_c0402	CAPN, 39PF
C650	128	21-13743N28	s_c0402	CAPN, 3.9PF
C651	130	21-13743N34	s_c0402	CAPN, 3.9PF
C652	130	21-13743N34	s_c0402	CAPN, 10PF
C653	135	21-13743N65	s_c0402	CAPN

C655	105	21-13743E12	s_c0603	CAPN, 1000PF
C656	109	21-13743G21	s_c1206	CAPN, 4.7UF
C675	119	21-13743M24	s_c0402	CAPN, 0.1UF
C676	114	21-13743L17	s_c0402	CAPN, 0.1UF
C677	117	21-13743L41	s_c0402	CAPN, 0.010UF
C678	121	21-13743N03	s_c0402	CAPN, 8.2PF
C679	121	21-13743N03	s_c0402	CAPN, DNP
C700	106	21-13743E20	s_c0603	CAPN, 0.1UF
C701	128	21-13743N28	s_c0402	CAPN, 39PF
C703	128	21-13743N28	s_c0402	CAPN, 39PF
C704	106	21-13743E20	s_c0603	CAPN, 0.1UF
C705	128	21-13743N28	s_c0402	CAPN, 39PF
C706	106	21-13743E20	s_c0603	CAPN, 0.1UF
C707	128	21-13743N28	s_c0402	CAPN, 39PF
C708	143	23-11049A07	s_ctanta_134x071	CAPP, 4.7UF
C709	128	21-13743N28	s_c0402	CAPN, 39PF
C728	119	21-13743M24	s_c0402	CAPN, 0.1UF
C729	119	21-13743M24	s_c0402	CAPN, 0.1UF
C730	8	00-DNP00043	s_c0402	CAPN
C731	8	00-DNP00043	s_c0402	CAPN
C732	8	00-DNP00043	s_c0402	CAPN, 0.010UF
C733	117	21-13743L41	s_c0402	CAPN, 0.010UF
C750	117	21-13743L41	s_c0402	CAPN, 0.010UF
C751	131	21-13743N36	s_c0402	CAPN, 0.010UF
C752	117	21-13743L41	s_c0402	CAPN, 0.010UF
C753	117	21-13743L41	s_c0402	CAPN, 0.010UF
C754	114	21-13743L17	s_c0402	CAPN, 4700PF
C755	117	21-13743L41	s_c0402	CAPN, 0.010UF
C756	117	21-13743L41	s_c0402	CAPN, 0.010UF
C775	5	00-DNP00005	s_c0603	CAPN
C776	86	21-09622N06	s_c0603	CAPN, 0.1UF
C777	117	21-13743L41	s_c0402	CAPN, 0.010UF
C778	117	21-13743L41	s_c0402	CAPN, 0.010UF
C779	117	21-13743L41	s_c0402	CAPN, 0.010UF
C780	106	21-13743E20	s_c0603	CAPN, 0.1UF
C781	106	21-13743E20	s_c0603	CAPN, 0.1UF
C782	106	21-13743E20	s_c0603	CAPN, 0.1UF
C783	106	21-13743E20	s_c0603	CAPN, 0.1UF
C784	106	21-13743E20	s_c0603	CAPN, 0.1UF
C785	117	21-13743L41	s_c0402	CAPN, 0.010UF
C786	98	21-13741F49	s_c0603	CAPN, 0.1UF
C1001	8	00-DNP00043	s_c0402	CAPN
C1002	132	21-13743N40	s_c0402	CAPN
C1003	8	00-DNP00043	s_c0402	CAPN
C1004	140	21-85736G01	s_c1210_06ht	CAPN
C1005	132	21-13743N40	s_c0402	CAPN
C1010	8	00-DNP00043	s_c0402	CAPN
C1011	5	00-DNP00005	s_c0603	CAPN
C1012	4	00-DNP00002	s_c1206	CAPN
C1013	5	00-DNP00005	s_c0603	CAPN
C1016	8	00-DNP00043	s_c0402	CAPN
C1017	132	21-13743N40	s_c0402	CAPN
C1051	132	21-13743N40	s_c0402	CAPN
C1052	132	21-13743N40	s_c0402	CAPN
C1053	132	21-13743N40	s_c0402	CAPN
C1054	132	21-13743N40	s_c0402	CAPN
C1055	132	21-13743N40	s_c0402	CAPN
C1056	132	21-13743N40	s_c0402	CAPN
C1057	132	21-13743N40	s_c0402	CAPN
C1058	8	00-DNP00043	s_c0402	CAPN
C1061	117	21-13743L41	s_c0402	CAPN

C1100	117	21-13743L41	s_c0402	CAPN
C1101	119	21-13743M24	s_c0402	CAPN
C1102	110	21-13743G26	s_c1206	CAPN
C1103	117	21-13743L41	s_c0402	CAPN
C1104	117	21-13743L41	s_c0402	CAPN
C1105	97	21-13741F37	s_c0603	CAPN
C1106	119	21-13743M24	s_c0402	CAPN
C1107	117	21-13743L41	s_c0402	CAPN
C1108	119	21-13743M24	s_c0402	CAPN
C1200	119	21-13743M24	s_c0402	CAPN
C1201	119	21-13743M24	s_c0402	CAPN
C1301	141	23-09121D09	s_ctantb_158x114	CAPP
C1400	117	21-13743L41	s_c0402	CAPN
C1601	117	21-13743L41	s_c0402	CAPN
C1605	117	21-13743L41	s_c0402	CAPN
C1611	117	21-13743L41	s_c0402	CAPN
C1613	117	21-13743L41	s_c0402	CAPN
C1614	117	21-13743L41	s_c0402	CAPN
C1615	117	21-13743L41	s_c0402	CAPN
C1616	100	21-13743A27	s_c0805	CAPN
C1617	117	21-13743L41	s_c0402	CAPN
C1700	117	21-13743L41	s_c0402	CAPN
C1701	119	21-13743M24	s_c0402	CAPN
C1703	132	21-13743N40	s_c0402	CAPN
C1704	132	21-13743N40	s_c0402	CAPN
C1705	132	21-13743N40	s_c0402	CAPN
C1706	119	21-13743M24	s_c0402	CAPN
C1709	119	21-13743M24	s_c0402	CAPN
C1710	92	21-13740L32	s_c0603	CAPN
C1720	132	21-13743N40	s_c0402	CAPN
C1721	132	21-13743N40	s_c0402	CAPN
C1722	132	21-13743N40	s_c0402	CAPN
C1723	132	21-13743N40	s_c0402	CAPN
C1724	132	21-13743N40	s_c0402	CAPN
C1725	132	21-13743N40	s_c0402	CAPN
C1750	119	21-13743M24	s_c0402	CAPN
C1751	132	21-13743N40	s_c0402	CAPN
C1770	127	21-13743N26	s_c0402	CAPN
C1771	131	21-13743N36	s_c0402	CAPN
C1901	118	21-13743M08	s_c0402	CAPN
C1902	110	21-13743G26	s_c1206	CAPN
C1903	106	21-13743E20	s_c0603	CAPN
C1907	117	21-13743L41	s_c0402	CAPN
C1908	95	21-13741F25	s_c0603	CAPN
C1909	93	21-13741F13	s_c0603	CAPN
C1910	119	21-13743M24	s_c0402	CAPN
C1912	119	21-13743M24	s_c0402	CAPN
C1913	94	21-13741F21	s_c0603	CAPN
C1914	106	21-13743E20	s_c0603	CAPN
C1915	96	21-13741F33	s_c0603	CAPN
C1916	106	21-13743E20	s_c0603	CAPN
C1917	132	21-13743N40	s_c0402	CAPN
C1919	106	21-13743E20	s_c0603	CAPN
C1920	104	21-13743E10	s_c0603	CAPN
C1921	119	21-13743M24	s_c0402	CAPN
C1922	119	21-13743M24	s_c0402	CAPN
C1923	119	21-13743M24	s_c0402	CAPN
C1924	119	21-13743M24	s_c0402	CAPN
C1925	117	21-13743L41	s_c0402	CAPN
C1930	106	21-13743E20	s_c0603	CAPN
C1933	117	21-13743L41	s_c0402	CAPN

C1934	117	21-13743L41	s_c0402	CAPN
C2000	140	21-85736G01	s_c1210_06ht	CAPN
C2001	140	21-85736G01	s_c1210_06ht	CAPN
C2003	140	21-85736G01	s_c1210_06ht	CAPN
C2006	102	21-13743E03	s_c0603	CAPN
C2007	106	21-13743E20	s_c0603	CAPN
C2008	102	21-13743E03	s_c0603	CAPN
C2011	108	21-13743F18	s_c0805	CAPN
C2012	138	21-13928N01	s_c0402	CAPN
C2013	142	23-09121D19	s_ctantb_158x114	CAPP
C2014	113	21-13743L13	s_c0402	CAPN, .047UF
C2019	140	21-85736G01	s_c1210_06ht	CAPN
C2021	139	21-13931F49	s_c0603	CAPN
C2022	110	21-13743G26	s_c1206	CAPN
C2024	140	21-85736G01	s_c1210_06ht	CAPN
C2099	103	21-13743E07	s_c0603	CAPN
C2100	144	23-11049A54	s_ctanta_134x071	CAPP
C2101	144	23-11049A54	s_ctanta_134x071	CAPP
C2300	119	21-13743M24	s_c0402	CAPN
C2400	140	21-85736G01	s_c1210_06ht	CAPN
C2401	8	00-DNP00043	s_c0402	CAPN
C2501	119	21-13743M24	s_c0402	CAPN
C2504	119	21-13743M24	s_c0402	CAPN
C10139	117	21-13743L41	s_c0402	CAPN
C10162	127	21-13743N26	s_c0402	CAPN
C10163	138	21-13928N01	s_c0402	CAPN
C10165	128	21-13743N28	s_c0402	CAPN
C10167	128	21-13743N28	s_c0402	CAPN
C10172	122	21-13743N09	s_c0402	CAPN
C10173	114	21-13743L17	s_c0402	CAPN
C10174	114	21-13743L17	s_c0402	CAPN
C10175	114	21-13743L17	s_c0402	CAPN
C10176	99	21-13742C28	s_c0603	CAPN
C10177	5	00-DNP00005	s_c0603	CAPN
C10178	87	21-13740F23	s_c0603	CAPN
C10179	88	21-13740F27	s_c0603	CAPN
C10180	133	21-13743N46	s_c0402	CAPN
C10181	134	21-13743N50	s_c0402	CAPN
C10182	134	21-13743N50	s_c0402	CAPN
C10183	134	21-13743N50	s_c0402	CAPN
C10185	137	21-13928A01	s_c0603	CAPN
C10186	116	21-13743L35	s_c0402	CAPN
C10187	91	21-13740F51	s_c0603	CAPN
C10188	111	21-13743H14	s_c1210_06ht	CAPN
C10189	130	21-13743N34	s_c0402	CAPN
C10190	117	21-13743L41	s_c0402	CAPN, 0.010UF
C10191	117	21-13743L41	s_c0402	CAPN, 0.010UF
C10194	127	21-13743N26	s_c0402	CAPN
C10199	138	21-13928N01	s_c0402	CAPN
C10200	128	21-13743N28	s_c0402	CAPN
C10203	117	21-13743L41	s_c0402	CAPN
C10204	117	21-13743L41	s_c0402	CAPN
C10205	119	21-13743M24	s_c0402	CAPN
C10209	129	21-13743N32	s_c0402	CAPN
C10210	128	21-13743N28	s_c0402	CAPN
C10211	128	21-13743N28	s_c0402	CAPN
C10212	124	21-13743N13	s_c0402	CAPN
C10213	123	21-13743N11	s_c0402	CAPN
C10214	117	21-13743L41	s_c0402	CAPN
C10215	106	21-13743E20	s_c0603	CAPN
C10216	120	21-13743N01	s_c0402	CAPN

C10217	133	21-13743N46	s_c0402	CAPN
C10218	131	21-13743N36	s_c0402	CAPN
C10219	106	21-13743E20	s_c0603	CAPN
C13204	8	00-DNP00043	s_c0402	CAPN
C13205	8	00-DNP00043	s_c0402	CAPN
C13206	138	21-13928N01	s_c0402	CAPN
C13207	132	21-13743N40	s_c0402	CAPN
C13208	117	21-13743L41	s_c0402	CAPN
C13209	117	21-13743L41	s_c0402	CAPN
C13210	117	21-13743L41	s_c0402	CAPN
C13213	117	21-13743L41	s_c0402	CAPN
C13214	117	21-13743L41	s_c0402	CAPN
C13216	117	21-13743L41	s_c0402	CAPN
C13217	137	21-13928A01	s_c0603	CAPN
C13219	110	21-13743G26	s_c1206	CAPN
C13220	132	21-13743N40	s_c0402	CAPN
C13221	132	21-13743N40	s_c0402	CAPN
C13225	137	21-13928A01	s_c0603	CAPN
C13226	145	23-11049A62	s_ctanta_134x071	CAPP
C13227	107	21-13743F16	s_c0805	CAPN
C13228	11	00-DNP00113	s_ctant0805	CAPP
C13229	137	21-13928A01	s_c0603	CAPN
C13231	128	21-13743N28	s_c0402	CAPN
C13232	128	21-13743N28	s_c0402	CAPN
C13233	132	21-13743N40	s_c0402	CAPN
C13234	132	21-13743N40	s_c0402	CAPN
C13235	132	21-13743N40	s_c0402	CAPN
C13236	112	21-13743L01	s_c0402	CAPN
C13237	8	00-DNP00043	s_c0402	CAPN
C13238	125	21-13743N17	s_c0402	CAPN
CPL625	230	58-85811G01	s_cp5885811g01	COUPLER_IOOC
CPL626	231	58-85811G02	s_cp5885811g02	COUPLER_IOOC
CR101	201	48-09948D06	s_sod110	DIODEAC
CR300	205	48-62824C01	s_vr075x057	VARACTORAC
CR475	189	48-09606E05	s_sot143	DIODE2CCAA
CR650	195	48-09877C17	s_sod323	VARACTORAC
CR700	188	48-09606E03	s_sc90	DIODECCA
CR1000	192	48-09653F02	s_cr4809653f02	DIODEAC
CR1001	15	00-DNP00222	s_sc70	DIODE2AAC
CR1002	13	00-DNP00127	s_sc90	DIODE2AAC
CR1003	20	00-DNP00401	s_sc70	DIODE2AAC
CR1004	20	00-DNP00401	s_sc70	DIODE2AAC
CR1008	12	00-DNP00121	s_sod323	DIODEAC
CR1009	12	00-DNP00121	s_sod323	DIODEAC
CR1011	203	48-13830A70	s_sot23	DIODEZ2CCA
CR1012	203	48-13830A70	s_sot23	DIODEZ2CCA
CR1150	174	48-09118D02	s_ds4809118d02	LED2ACCA
CR1750	187	48-09606E02	s_sc90	DIODE2AAC
CR2001	192	48-09653F02	s_cr4809653f02	DIODEAC
CR2002	192	48-09653F02	s_cr4809653f02	DIODEAC
CR2003	186	48-09606E01	s_sc70	DIODECCA
CR2050	186	48-09606E01	s_sc70	DIODECCA
CR2100	196	48-09924D06	s_sot23	DIODEACCA
CR2106	203	48-13830A70	s_sot23	DIODEZ2CCA
CR2108	187	48-09606E02	s_sc90	DIODE2AAC
FID0	1	00-BRD00046	s_fid_040	FID
FID1	1	00-BRD00046	s_fid_040	FID
FID2	1	00-BRD00046	s_fid_040	FID
FID3	1	00-BRD00046	s_fid_040	FID
FL75	236	91-85783G01	s_fl9185783g01	FILTER_DUPTARG_PN, 1900MHZ
FL101	237	91-85807G01	s_fl9185807g01	FILTERRCLG, 1800MHZ

FL401	235	91-85782G01	s_fl9185782g01	FILTERIGO, 1900MHZ
FL402	235	91-85782G01	s_fl9185782g01	FILTERIGO, 1900MHZ
FL403	232	58-85851G01	s_fl5885851g01	FILTER_LDB20, 1700MHZ
FL404	233	91-85646H01	s_fl9185646h01	FILTER_I9I10O3O4_PN, 238MHZ
FL405	234	91-85646H02	s_fl9185646h02	FILTER_I9I10O3O4_PN, 148MHZ
J1	85	09-09449B04	s_cn0909449b04	CON
J101	171	28-09454C02	s_cn2809454c02	CON
J810	14	00-DNP00157	s_cn3909578m01	CON
J811	14	00-DNP00157	s_cn3909578m01	CON
J812	14	00-DNP00157	s_cn3909578m01	CON
J813	14	00-DNP00157	s_cn3909578m01	CON
J1000	82	09-09059E01	s_cn0909059e01	CON
J2000	84	09-09399T06	s_cn0909399t06	CON_POWERJACK_F
J5000	83	09-09195E01	l_cn0909195e01_noslot	CON
L76	7	00-DNP00038	s_ind0603	INDNIO
L77	155	24-09646M07	s_ind0603	INDNIO
L102	150	24-09257L02	s_ind0603_02ht	INDNIO
L200	151	24-09257L05	s_ind0603_02ht	INDNIO
L203	157	24-09646M70	s_ind0603	INDNIO
L300	164	24-62587V03	s_ind2462587v	INDNIO, 47NH
L401	148	24-09154M01	s_ind0402	INDNIO
L402	154	24-09646M01	s_ind0603	INDNIO, 10NH
L411	159	24-09646M94	s_ind0603	INDNIO, 82NH
L650	167	24-85793G08	s_ind070x043	INDNIO, 27NH
L675	161	24-62587P09	s_ind098x080	INDNIO, 560NH
L676	160	24-09704K48	s_ind0805_039ht	INDNIO, 27NH
L728	158	24-09646M73	s_ind0603	INDNIO
L729	158	24-09646M73	s_ind0603	INDNIO
L777	163	24-62587Q36	s_ind0805_041ht	INDNIO, 560NH
L2000	166	24-85719G01	s_ind126x098	INDNIO
L2011	162	24-62587Q03	s_ind0805_041ht	INDNIO
L2013	156	24-09646M15	s_ind0603	INDNIO
L2014	156	24-09646M15	s_ind0603	INDNIO
L2015	159	24-09646M94	s_ind0603	INDNIO
L2016	159	24-09646M94	s_ind0603	INDNIO
L2017	165	24-62587V24	s_ind2462587v	INDNIO
L2018	170	24-85793G20	s_ind070x043	INDNIO
L2019	170	24-85793G20	s_ind070x043	INDNIO
L2020	168	24-85793G11	s_ind070x043	INDNIO
L2021	168	24-85793G11	s_ind070x043	INDNIO
L2025	149	24-09257L01	s_ind0603_02ht	INDNIO
L2027	169	24-85793G13	s_ind070x043	INDNIO
L2028	169	24-85793G13	s_ind070x043	INDNIO
L2030	153	24-09257L18	s_ind0603_02ht	INDNIO
L2031	7	00-DNP00038	s_ind0603	INDNIO
L2033	169	24-85793G13	s_ind070x043	INDNIO
L2034	152	24-09257L08	s_ind0603_02ht	INDNIO
L2035	7	00-DNP00038	s_ind0603	INDNIO
LS1	206	50-09365S01	s_tr5009365s01	SPEAKER_P
Q50	197	48-09939C03	s_umt6	NPNPNPGIOOGI
Q100	177	48-09527E18	s_sot343mod	NPNBECE
Q325	198	48-09939C04	s_um5	NPNPNPOOGIG
Q350	191	48-09608E03	s_sc90	PNPGIO
Q675	179	48-09527E24	s_sc90_ccw	NPNBEC
Q1000	198	48-09939C04	s_um5	NPNPNPOOGIG
Q1001	17	00-DNP00361	s_sc59	MOSFETPDDGSDD_EN
Q1002	17	00-DNP00361	s_sc59	MOSFETPDDGSDD_EN
Q1003	9	00-DNP00088	s_um5	NPNPNPOOGIG
Q1004	176	48-09523E02	s_soic8_150	MOSFETP_AA_SGDD_CC
Q1007	17	00-DNP00361	s_sc59	MOSFETPDDGSDD_EN
Q1008	183	48-09579E14	s_soic8_150	MOSFETPSGDD_SGDD_EN

Q1009	17	00-DNP00361	s_sc59	MOSFETPDDGSDD_EN
Q1010	17	00-DNP00361	s_sc59	MOSFETPDDGSDD_EN
Q1101	191	48-09608E03	s_sc90	PNPGIO
Q1150	180	48-09579E02	s_sc90	MOSFETNSGD_EN
Q1151	180	48-09579E02	s_sc90	MOSFETNSGD_EN
Q1300	182	48-09579E12	s_sot23	MOSFETPGSD_EN
Q1301	180	48-09579E02	s_sc90	MOSFETNSGD_EN
Q1703	180	48-09579E02	s_sc90	MOSFETNSGD_EN
Q1704	180	48-09579E02	s_sc90	MOSFETNSGD_EN
Q1705	180	48-09579E02	s_sc90	MOSFETNSGD_EN
Q1750	190	48-09607E04	s_sot89	PNPBCE
Q1751	200	48-09940E03	s_sc90	NPNEBC_BR
Q1900	191	48-09608E03	s_sc90	PNPGIO
Q1901	199	48-09940E01	s_sc70	NPNBEC
Q1903	185	48-09605E02	s_sc90	NPNEBC
Q1905	181	48-09579E04	s_soic8_150	MOSFETPSSSGDDDD_EN
Q1906	178	48-09527E20	s_sc70	NPNBEC
Q2000	191	48-09608E03	s_sc90	PNPGIO
Q2500	182	48-09579E12	s_sot23	MOSFETPGSD_EN
Q2501	182	48-09579E12	s_sot23	MOSFETPGSD_EN
Q2502	198	48-09939C04	s_um5	NPNPNPOOGIG
Q2503	180	48-09579E02	s_sc90	MOSFETNSGD_EN
Q2504	184	48-09579E24	s_sc90_ccw	MOSFETPGSD_EN
Q2505	180	48-09579E02	s_sc90	MOSFETNSGD_EN
Q2506	184	48-09579E24	s_sc90_ccw	MOSFETPGSD_EN
Q2508	10	00-DNP00110	s_sc90	NPNEBC
Q2509	180	48-09579E02	s_sc90	MOSFETNSGD_EN
R50	57	06-62057M98	s_r0402	RES
R51	57	06-62057M98	s_r0402	RES
R52	57	06-62057M98	s_r0402	RES
R103	31	06-62057M45	s_r0402	RES
R200	55	06-62057M94	s_r0402	RES
R300	52	06-62057M90	s_r0402	RES, 4.7K
R301	57	06-62057M98	s_r0402	RES, 10K
R325	41	06-62057M74	s_r0402	RES
R400	74	06-62057N33	s_r0402	RES
R401	29	06-62057M40	s_r0402	RES
R402	29	06-62057M40	s_r0402	RES
R403	46	06-62057M81	s_r0402	RES
R405	24	06-62057M01	s_r0402	RES
R407	61	06-62057N06	s_r0402	RES
R408	66	06-62057N13	s_r0402	RES
R409	6	00-DNP00037	s_r0402	RES
R410	24	06-62057M01	s_r0402	RES
R413	61	06-62057N06	s_r0402	RES
R414	66	06-62057N13	s_r0402	RES
R475	56	06-62057M95	s_r0402	RES, 7.5K
R476	52	06-62057M90	s_r0402	RES, 4.7K
R477	65	06-62057N11	s_r0402	RES
R478	65	06-62057N11	s_r0402	RES, 33K
R479	66	06-62057N13	s_r0402	RES
R600	48	06-62057M84	s_r0402	RES, 1K
R602	55	06-62057M94	s_r0402	RES, 18K
R628	30	06-62057M43	s_r0402	RES, 51
R650	45	06-62057M80	s_r0402	RES, 2.7K
R651	56	06-62057M95	s_r0402	RES, 7.5K
R652	43	06-62057M78	s_r0402	RES, 390
R675	36	06-62057M62	s_r0402	RES, 560
R676	44	06-62057M79	s_r0402	RES, 2.7K
R677	42	06-62057M76	s_r0402	RES, 1.2K
R678	33	06-62057M54	s_r0402	RES, 330

R700	25	06-62057M26	s_r0402	RES, 10
R703	25	06-62057M26	s_r0402	RES, 10
R705	24	06-62057M01	s_r0402	RES
R706	24	06-62057M01	s_r0402	RES
R709	25	06-62057M26	s_r0402	RES, 10
R725	6	00-DNP00037	s_r0402	RES, DNP
R728	32	06-62057M50	s_r0402	RES, 10
R729	25	06-62057M26	s_r0402	RES, 10
R730	24	06-62057M01	s_r0402	RES
R731	24	06-62057M01	s_r0402	RES
R732	24	06-62057M01	s_r0402	RES, 10
R752	32	06-62057M50	s_r0402	RES, 100
R1000	24	06-62057M01	s_r0402	RES
R1001	6	00-DNP00037	s_r0402	RES
R1003	6	00-DNP00037	s_r0402	RES
R1004	81	06-80195M64	s_r2010	RES
R1006	71	06-62057N23	s_r0402	RES
R1008	47	06-62057M82	s_r0402	RES
R1009	24	06-62057M01	s_r0402	RES
R1010	21	06-09591M37	s_2r0402	RES2
R1011	21	06-09591M37	s_2r0402	RES2
R1012	6	00-DNP00037	s_r0402	RES
R1013	32	06-62057M50	s_r0402	RES
R1018	52	06-62057M90	s_r0402	RES
R1102	24	06-62057M01	s_r0402	RES
R1103	52	06-62057M90	s_r0402	RES
R1104	22	06-09591M45	s_2r0402	RES2
R1105	67	06-62057N15	s_r0402	RES
R1109	6	00-DNP00037	s_r0402	RES
R1110	21	06-09591M37	s_2r0402	RES2
R1113	60	06-62057N05	s_r0402	RES
R1120	28	06-62057M36	s_r0402	RES
R1125	52	06-62057M90	s_r0402	RES
R1150	37	06-62057M64	s_r0402	RES
R1151	33	06-62057M54	s_r0402	RES
R1203	24	06-62057M01	s_r0402	RES
R1210	57	06-62057M98	s_r0402	RES
R1300	24	06-62057M01	s_r0402	RES
R1301	67	06-62057N15	s_r0402	RES
R1400	24	06-62057M01	s_r0402	RES
R1600	21	06-09591M37	s_2r0402	RES2
R1603	24	06-62057M01	s_r0402	RES
R1611	79	06-62057V02	s_r0402	RES
R1700	57	06-62057M98	s_r0402	RES
R1701	24	06-62057M01	s_r0402	RES
R1702	64	06-62057N10	s_r0402	RES
R1703	57	06-62057M98	s_r0402	RES
R1705	57	06-62057M98	s_r0402	RES
R1707	57	06-62057M98	s_r0402	RES
R1711	71	06-62057N23	s_r0402	RES
R1718	49	06-62057M85	s_r0402	RES
R1720	22	06-09591M45	s_2r0402	RES2
R1722	22	06-09591M45	s_2r0402	RES2
R1724	71	06-62057N23	s_r0402	RES
R1725	57	06-62057M98	s_r0402	RES
R1741	6	00-DNP00037	s_r0402	RES
R1750	71	06-62057N23	s_r0402	RES
R1751	58	06-62057N01	s_r0402	RES
R1752	65	06-62057N11	s_r0402	RES
R1771	77	06-62057N39	s_r0402	RES
R1772	23	06-62057B46	s_r0603	RES

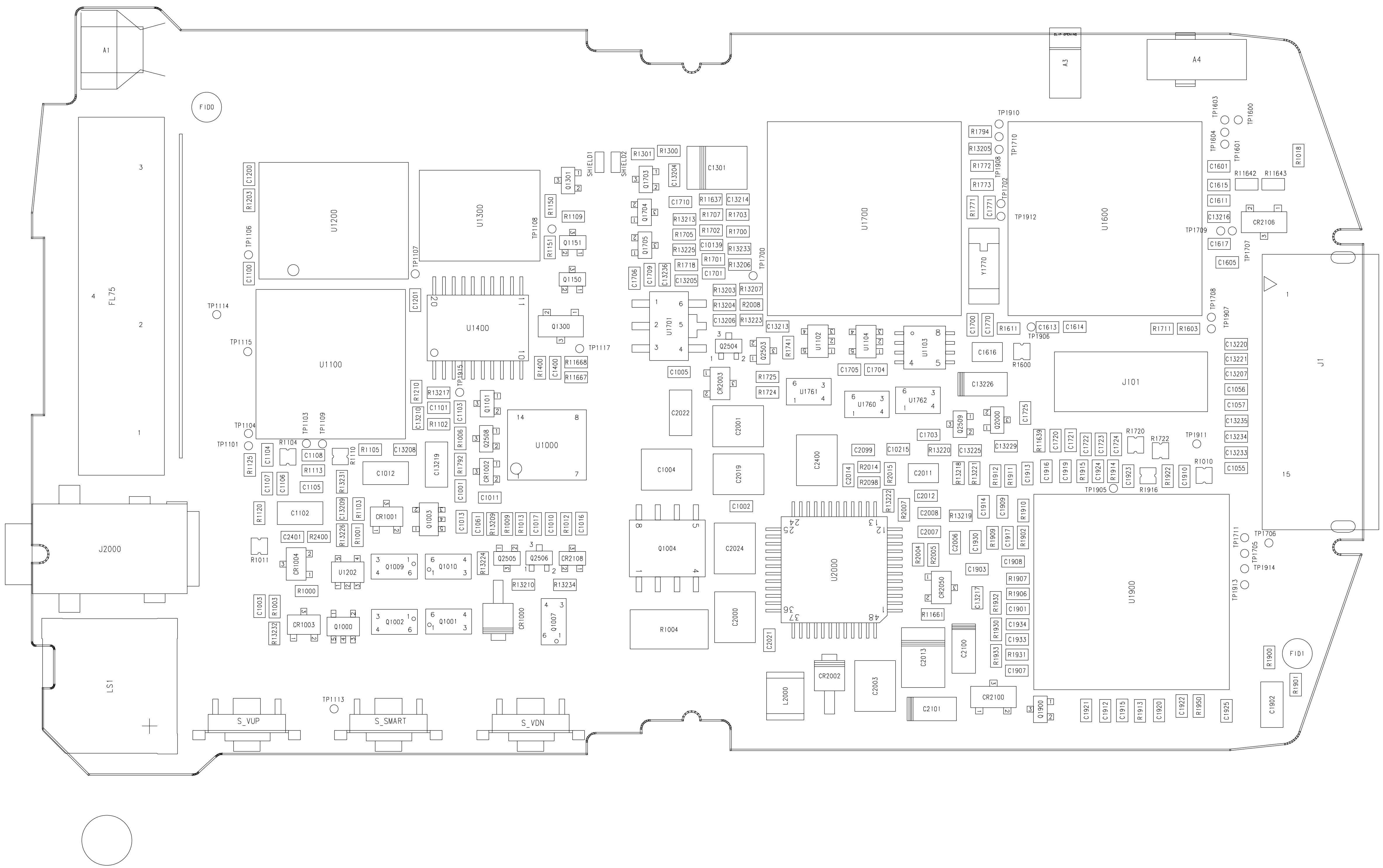
R1773	23	06-62057B46	s_r0603	RES
R1792	24	06-62057M01	s_r0402	RES
R1794	24	06-62057M01	s_r0402	RES
R1900	51	06-62057M88	s_r0402	RES
R1901	41	06-62057M74	s_r0402	RES
R1902	52	06-62057M90	s_r0402	RES
R1906	51	06-62057M88	s_r0402	RES
R1907	68	06-62057N17	s_r0402	RES
R1909	54	06-62057M92	s_r0402	RES
R1910	72	06-62057N25	s_r0402	RES
R1911	69	06-62057N19	s_r0402	RES
R1912	70	06-62057N20	s_r0402	RES
R1913	59	06-62057N03	s_r0402	RES
R1914	24	06-62057M01	s_r0402	RES
R1915	24	06-62057M01	s_r0402	RES
R1916	21	06-09591M37	s_2r0402	RES2
R1922	6	00-DNP00037	s_r0402	RES
R1930	80	06-62057V07	s_r0402	RES
R1931	80	06-62057V07	s_r0402	RES
R1932	56	06-62057M95	s_r0402	RES
R1933	56	06-62057M95	s_r0402	RES
R1950	6	00-DNP00037	s_r0402	RES
R2004	76	06-62057N37	s_r0402	RES
R2005	69	06-62057N19	s_r0402	RES
R2007	34	06-62057M58	s_r0402	RES
R2008	6	00-DNP00037	s_r0402	RES
R2014	63	06-62057N09	s_r0402	RES
R2015	63	06-62057N09	s_r0402	RES
R2017	6	00-DNP00037	s_r0402	RES
R2098	62	06-62057N07	s_r0402	RES
R2400	26	06-62057M32	s_r0402	RES
R2501	32	06-62057M50	s_r0402	RES
R11600	6	00-DNP00037	s_r0402	RES
R11601	40	06-62057M70	s_r0402	RES
R11602	40	06-62057M70	s_r0402	RES
R11603	30	06-62057M43	s_r0402	RES
R11604	71	06-62057N23	s_r0402	RES
R11607	41	06-62057M74	s_r0402	RES
R11608	50	06-62057M86	s_r0402	RES
R11609	50	06-62057M86	s_r0402	RES
R11611	35	06-62057M60	s_r0402	RES
R11612	48	06-62057M84	s_r0402	RES
R11613	53	06-62057M91	s_r0402	RES
R11614	24	06-62057M01	s_r0402	RES
R11615	54	06-62057M92	s_r0402	RES
R11616	43	06-62057M78	s_r0402	RES
R11618	52	06-62057M90	s_r0402	RES
R11619	52	06-62057M90	s_r0402	RES
R11620	39	06-62057M67	s_r0402	RES
R11621	39	06-62057M67	s_r0402	RES
R11622	57	06-62057M98	s_r0402	RES
R11624	30	06-62057M43	s_r0402	RES
R11632	30	06-62057M43	s_r0402	RES
R11633	6	00-DNP00037	s_r0402	RES
R11637	33	06-62057M54	s_r0402	RES
R11639	73	06-62057N27	s_r0402	RES
R11642	32	06-62057M50	s_r0402	RES
R11643	32	06-62057M50	s_r0402	RES
R11650	46	06-62057M81	s_r0402	RES
R11654	24	06-62057M01	s_r0402	RES
R11657	67	06-62057N15	s_r0402	RES

R11658	24	06-62057M01	s_r0402	RES
R11661	25	06-62057M26	s_r0402	RES
R11667	6	00-DNP00037	s_r0402	RES
R11668	6	00-DNP00037	s_r0402	RES
R13203	58	06-62057N01	s_r0402	RES
R13204	75	06-62057N34	s_r0402	RES
R13205	52	06-62057M90	s_r0402	RES
R13206	57	06-62057M98	s_r0402	RES
R13207	24	06-62057M01	s_r0402	RES
R13209	78	06-62057N47	s_r0402	RES
R13210	32	06-62057M50	s_r0402	RES
R13213	57	06-62057M98	s_r0402	RES
R13215	24	06-62057M01	s_r0402	RES
R13217	67	06-62057N15	s_r0402	RES
R13218	41	06-62057M74	s_r0402	RES
R13219	55	06-62057M94	s_r0402	RES
R13220	73	06-62057N27	s_r0402	RES
R13221	62	06-62057N07	s_r0402	RES
R13222	38	06-62057M66	s_r0402	RES
R13223	24	06-62057M01	s_r0402	RES
R13224	24	06-62057M01	s_r0402	RES
R13225	6	00-DNP00037	s_r0402	RES
R13226	6	00-DNP00037	s_r0402	RES
R13227	24	06-62057M01	s_r0402	RES
R13231	67	06-62057N15	s_r0402	RES
R13232	6	00-DNP00037	s_r0402	RES
R13233	67	06-62057N15	s_r0402	RES
R13234	27	06-62057M33	s_r0402	RES
R13235	6	00-DNP00037	s_r0402	RES
R13236	24	06-62057M01	s_r0402	RES
SHIELD1	2	00-BRD00304	s_short_7mil	SHORT
SHIELD2	2	00-BRD00304	s_short_7mil	SHORT
SHIELD3	2	00-BRD00304	s_short_7mil	SHORT
SHIELD4	2	00-BRD00304	s_short_7mil	SHORT
S_SMART	173	40-09060E01	s_sw4009060e01	SW_PUSHB_PN
S_VDN	173	40-09060E01	s_sw4009060e01	SW_PUSHB_PN
S_VUP	173	40-09060E01	s_sw4009060e01	SW_PUSHB_PN
TP1101	3	00-BRD00317	s_tp021x025rect	TP
TP1103	3	00-BRD00317	s_tp021x025rect	TP
TP1104	3	00-BRD00317	s_tp021x025rect	TP
TP1106	3	00-BRD00317	s_tp021x025rect	TP
TP1107	3	00-BRD00317	s_tp021x025rect	TP
TP1108	3	00-BRD00317	s_tp021x025rect	TP
TP1109	3	00-BRD00317	s_tp021x025rect	TP
TP1113	3	00-BRD00317	s_tp021x025rect	TP
TP1114	3	00-BRD00317	s_tp021x025rect	TP
TP1115	3	00-BRD00317	s_tp021x025rect	TP
TP1117	3	00-BRD00317	s_tp021x025rect	TP
TP1600	3	00-BRD00317	s_tp021x025rect	TP
TP1601	3	00-BRD00317	s_tp021x025rect	TP
TP1603	3	00-BRD00317	s_tp021x025rect	TP
TP1604	3	00-BRD00317	s_tp021x025rect	TP
TP1700	3	00-BRD00317	s_tp021x025rect	TP
TP1702	3	00-BRD00317	s_tp021x025rect	TP
TP1705	3	00-BRD00317	s_tp021x025rect	TP
TP1706	3	00-BRD00317	s_tp021x025rect	TP
TP1707	3	00-BRD00317	s_tp021x025rect	TP
TP1708	3	00-BRD00317	s_tp021x025rect	TP
TP1709	3	00-BRD00317	s_tp021x025rect	TP
TP1710	3	00-BRD00317	s_tp021x025rect	TP
TP1711	3	00-BRD00317	s_tp021x025rect	TP

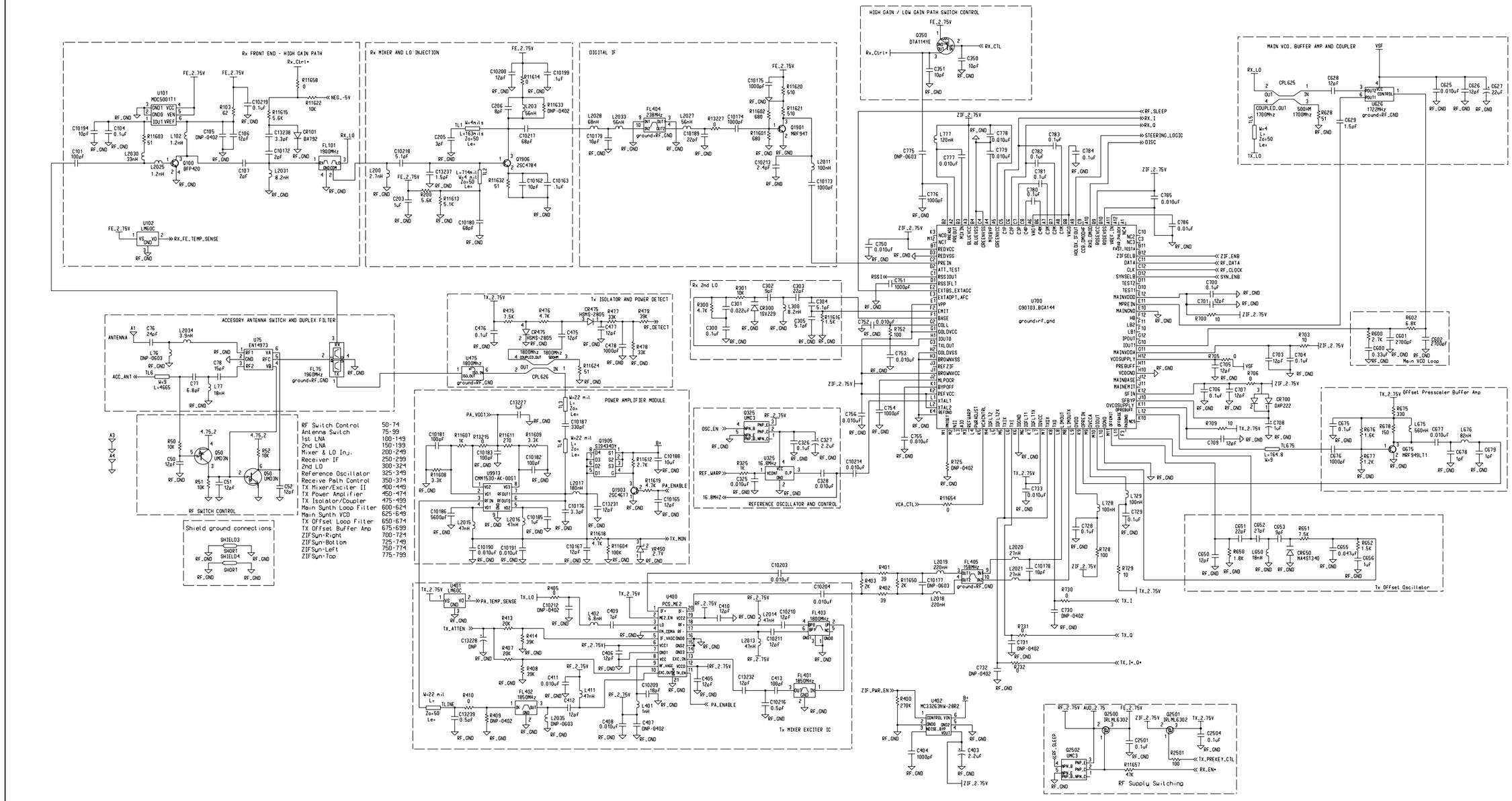
TP1905	3	00-BRD00317	s_tp021x025rect	TP
TP1906	3	00-BRD00317	s_tp021x025rect	TP
TP1907	3	00-BRD00317	s_tp021x025rect	TP
TP1908	3	00-BRD00317	s_tp021x025rect	TP
TP1910	3	00-BRD00317	s_tp021x025rect	TP
TP1911	3	00-BRD00317	s_tp021x025rect	TP
TP1912	3	00-BRD00317	s_tp021x025rect	TP
TP1913	3	00-BRD00317	s_tp021x025rect	TP
TP1914	3	00-BRD00317	s_tp021x025rect	TP
TP1915	3	00-BRD00317	s_tp021x025rect	TP
U75	212	51-09572E11	s_u5109572e11	EN14973
U101	216	51-09781E91	s_sot363_043ht	MDC5001
U102	214	51-09768D06	s_sot23	LM60_SOT23
U325	194	48-09863M14	s_os4809863m14	OSCVGOV, 16.8MHZ
U400	221	51-09923D37	s_u5109923d37	MXR_EXCITER_2_ME2
U401	214	51-09768D06	s_sot23	LM60_SOT23
U402	208	51-09512F17	s_sot23l	TK11242A_SOT23L
U475	229	58-85810G01	s_iso5885810g01	ISOLATOR_I6O1_PN, 1700MHZ
U626	175	48-09283D28	s_os4809283d28	OSC_VC43_PN, 1635MHZ
U700	219	51-09879E10	s_u144bga_0394_12x12_512sq	ZIF_SYN_BGA144
U1000	16	00-DNP00354	s_tssop14_175	ABC14_TSSOP14
U1100	218	51-09841C47	s_u140bga_0315_12x12_394sq	MC68338_140BGA
U1101	225	51-99249A01	s_tsoc6_150	DS2401_TSOC6
U1102	211	51-09522E22	s_ssop5_050	AND2
U1103	209	51-09522E16	s_ssop8_110	TC7W74FU
U1104	210	51-09522E17	s_ssop5_050	NAND2
U1200	228	51-99366A01	s_u48bga_0295_8x6_307x395	EPROM_28F160B3_48BGA
U1202	211	51-09522E22	s_ssop5_050	AND2
U1300	207	51-09509A16	s_u48bga_0295_6x8_240x318	KM16FX1000_48BGA_V2
U1400	227	51-99353A01	s_tssop20_175	EEPROM_AT25128_TSSOP20
U1600	226	51-99338A01	s_u144bga_0394_12x12	DSP56603_144BGA
U1700	224	51-09962C09	s_u144bga_0394_12x12_512sq	CRIB_144BGA
U1701	217	51-09781E93	s_sot89-5	TK11233_SOT89-5
U1760	215	51-09781E79	s_sot23-6	MAX4544
U1761	215	51-09781E79	s_sot23-6	MAX4544
U1762	215	51-09781E79	s_sot23-6	MAX4544
U1900	220	51-09923D31	s_u144bga_0394_12x12_516sq	CIA_H97F_144BGA
U2000	222	51-09923D38	s_pqfp48	GCAP_QFP48_V2
U2300	213	51-09632D99	s_qsop16_150	MAX511
U9913	223	51-09940K26	s_u5109940k26	CMM1530
VR450	204	48-13830A73	s_sot23	DIODEZANC
VR1000	193	48-09788E06	s_sod323	DIODEZAC
Y1770	202	48-09995L05	s_y4809995l05	XTALIO, 32.768KHZ

CDMA ST7762 : TOP SIDE BOARD OVERLAY

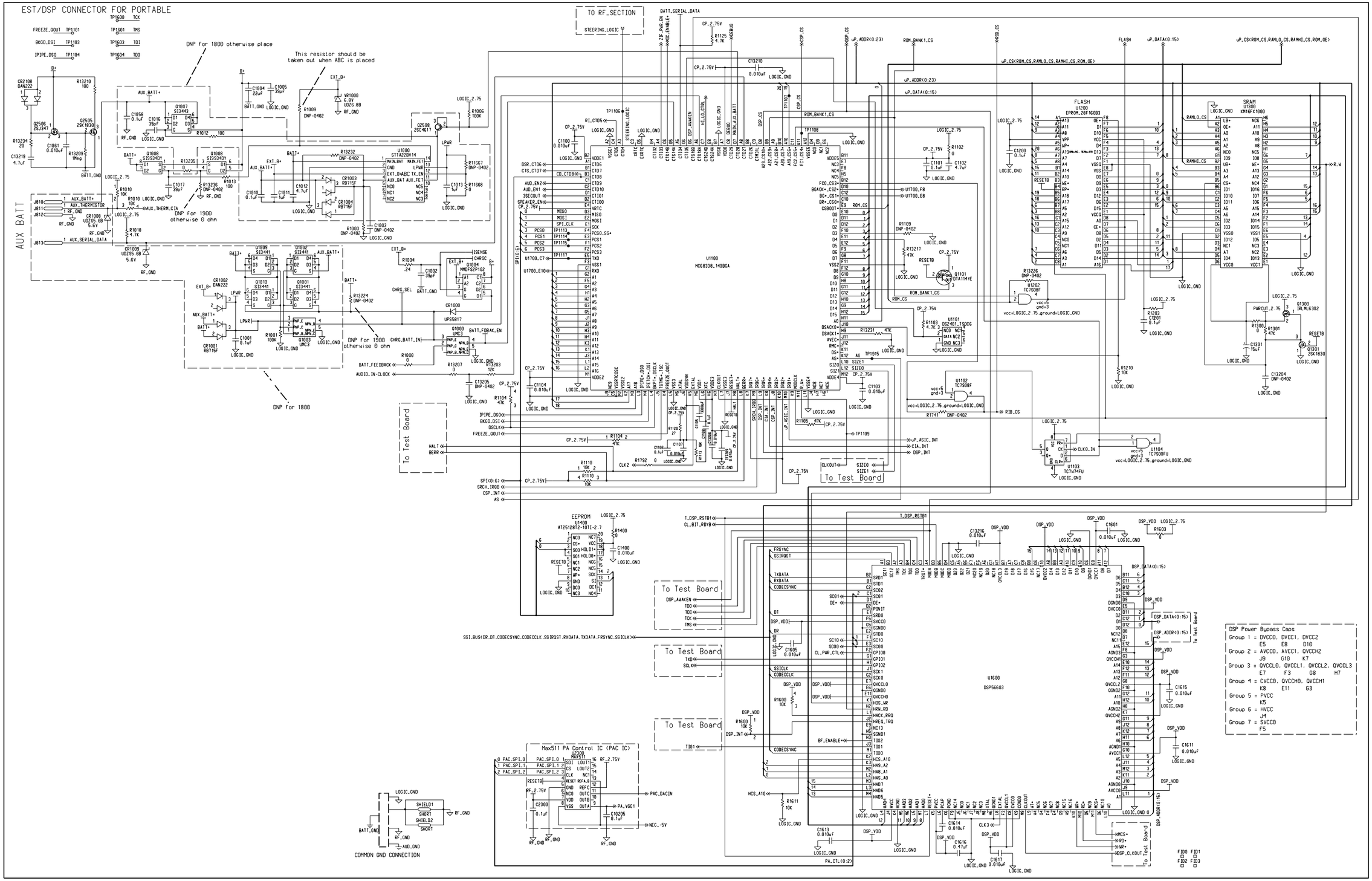
CDMA ST7762 : BOTTOM SIDE BOARD OVERLAY



CDMA ST7762 : RF SCHEMATICS



CDMA ST7762 : AL SCHEMATICS SIDE 1 OF 2



CDMA ST7762 : AL SCHEMATICS SIDE 2 OF 2