



MOTOROLA

Personal Communications Sector

V2282



Level III
Service Manual

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SECTION 1: GENERAL

1.1 Introduction

This manual is intended for use by technicians familiar with similar types of equipment. It contains all service information required for the equipment described and is current as of the printing date.

The scope of this document is to provide the reader with basic information relating to the V2282, and also to provide procedures and processes for repairing the units up to and including Level 2 repair.

Level 1 and 2 repairs involve the following activities to be carried out: -

- Unit swap out
- Repairing of mechanical faults
- Basic modular troubleshooting
- Testing and verification of unit functionality
- Upgrading software
- Flexing units
- Initiate warranty claims and send faulty modules to Level 3 or 4 repair centres.

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1.2 Motorola Service Policy for V2282 in warranty

1.2.1 Warranty:

Product will be sold with the standard 12 months warranty terms and conditions. Accidental damage misuse, retailers extended warranties will not be supported under warranty. Non warranty repairs will be available at agreed fixed repair prices.

Proof of purchase will be required to validate warranty claims.

1.2.2 Out of Box Failure Policy

The standard OOB failure criteria will apply. Customer units that fail very early on, after date of sale, are to be returned to Manufacturing for root cause analysis, to guard against epidemic criteria.

Manufacturing to bear the costs of early life failure.

1.2.3 Product Support

Customers original units will be repaired but not refurbished as standard. Appointed Motorola Service Hubs will perform warranty and non-warranty field service for level 2 (assemblies) and level 3 (limited PCB component). The Motorola HTC centres will perform level 4 (full component) repairs.

1.2.4 Customer Support:

This will be available through dedicated Call Centres and In Country Help Desks.

Product Service training should be arranged through the local Motorola Support Centre.

1.2.5 Replacement Parts Ordering

Only centres authorized to carry out repairs will be able to purchase spare parts. Orders for spare parts from Hub's and Hi-Tech Centres should be placed with the regional Motorola Parts Distribution Centre.

1.3 General Safety Information

1.3.1 Portable Operation

- DO NOT hold the radio so that the antenna is very close to, or touching, exposed parts of the body, especially the face or eyes whilst transmitting. The radio will perform best if it is held in the same manner as you would hold a 'land' telephone handset, with the antenna angled up and over your shoulder.
- DO NOT operate the portable phone in an aircraft. Switch off your telephone. The use of a cellular telephone in an aircraft may be dangerous to the operation of the aircraft, disruption of the Cellular Network may occur, and is illegal. Failure to observe this instruction may lead to a suspension or denial of Cellular Telephone Service to the offender, or legal action, or both.

1.3.2 Mobile/Portable Operation - Telephone use in Vehicles:

- All equipment must be properly grounded according to installation instructions for safe operation.
- Users are advised to turn off their equipment when at a refueling point.
- Safety is every driver's responsibility. Cellular telephones should only be used in situations in which the driver considers it safe to do so.

1.3.3 General

- DO NOT allow children to play with any radio equipment containing a transmitter.
- DO NOT operate this equipment near electrical blasting caps or in an explosive atmosphere. Mobile Telephones are, under certain conditions, capable of interfering with blasting operations. When you are in the vicinity of such work, look out for and observe signs cautioning against mobile radio transmission. If transmission is prohibited, you must turn off your mobile telephone to prevent any transmission.
In standby mode the mobile telephone will automatically transmit to acknowledge a call if it is not turned off.
- Refer to the appropriate section of the product user manual for additional pertinent safety information
- All equipment should be serviced only by a Motorola qualified technician.

**SECTION 2:
V2282
DESCRIPTION**

2.1 Specifications of V2282

General

Function	Specification
Frequency Range GSM PCS	1850.2-1909.8 MHz Tx 1930.2-1989.8 MHz Rx
FM Radio Range	87.5–108.0 MHz
Channel Spacing	200 kHz
Channels	174 GSM/374 DCS carriers with 8 channels per carrier
Modulation	GMSK at BT = 0.3
Transmitter Phase Accuracy	5 Degrees RMS, 20 Degrees peak
Duplex Spacing	45 MHz GSM / 95MHz DCS
Frequency Stability	± 0.10 ppm of the downlink frequency (Rx)
Operating Voltage	Mid Rate Charger: 4.0V, 350mA +/-10% (Open Circuit Voltage =13.0V +/- 10%) EIHf or VPA Supply: Mid Rate = 6.25V, 400mA +/-5% Fast Rate = 6.25V, 900mA +/-5% Battery Operating Voltage: 2.85V(Radio Shut Down voltage) To 5.1V Max (Radio Over Voltage Protect)
Transmit Current	Typically 300 mA avg, 1.0A peak
Stand-by Current	Typically 7.0 mA (DRX2)
Dimensions	130mm x 47mm x 27mm
Size (Volume)	120cc with Battery
Weight	140g with Battery
Temperature Range	-10C to +55C

Transmitter

Function	Specification
RF Power Output	33 dBm ± 2dB GSM/ 30 dBm ± 2 dB DCS
Output Impedance	50 ohms (nominal)
Spurious Emissions	-36 dBm from 0.1 to 1 Ghz -30 dBm from 1 to 4 Ghz

Receiver

Function	Specification
RF Level	-102 dBm GSM / -100 dBm DCS
RX bit error rate (100 k bits)	< 2%
Channel Hop Time	500 microseconds
Time to Camp	Approximately 5-10 seconds

Speech Coding

Function	Specification
Speech Coding Type	Regular Pulse Excitation / Linear Predictive Coding with Long Term Prediction. (RPE LPC with LTP).
Bit Rate	13.0 k bps
Frame Duration	20 ms
Block Length	260 bits
Classes	Class 1 bits = 182 bits. Class 2 bits = 78 bits
Bit Rate with FEC Encoding	22.8 k bps

2.2 V2282 Overview

The V2282 is the first cellular product that incorporates products aimed at a wide audience and is branded in the V. range. Aimed at persons who think as themselves of living in a world of personal expression, status and individuality through belonging.

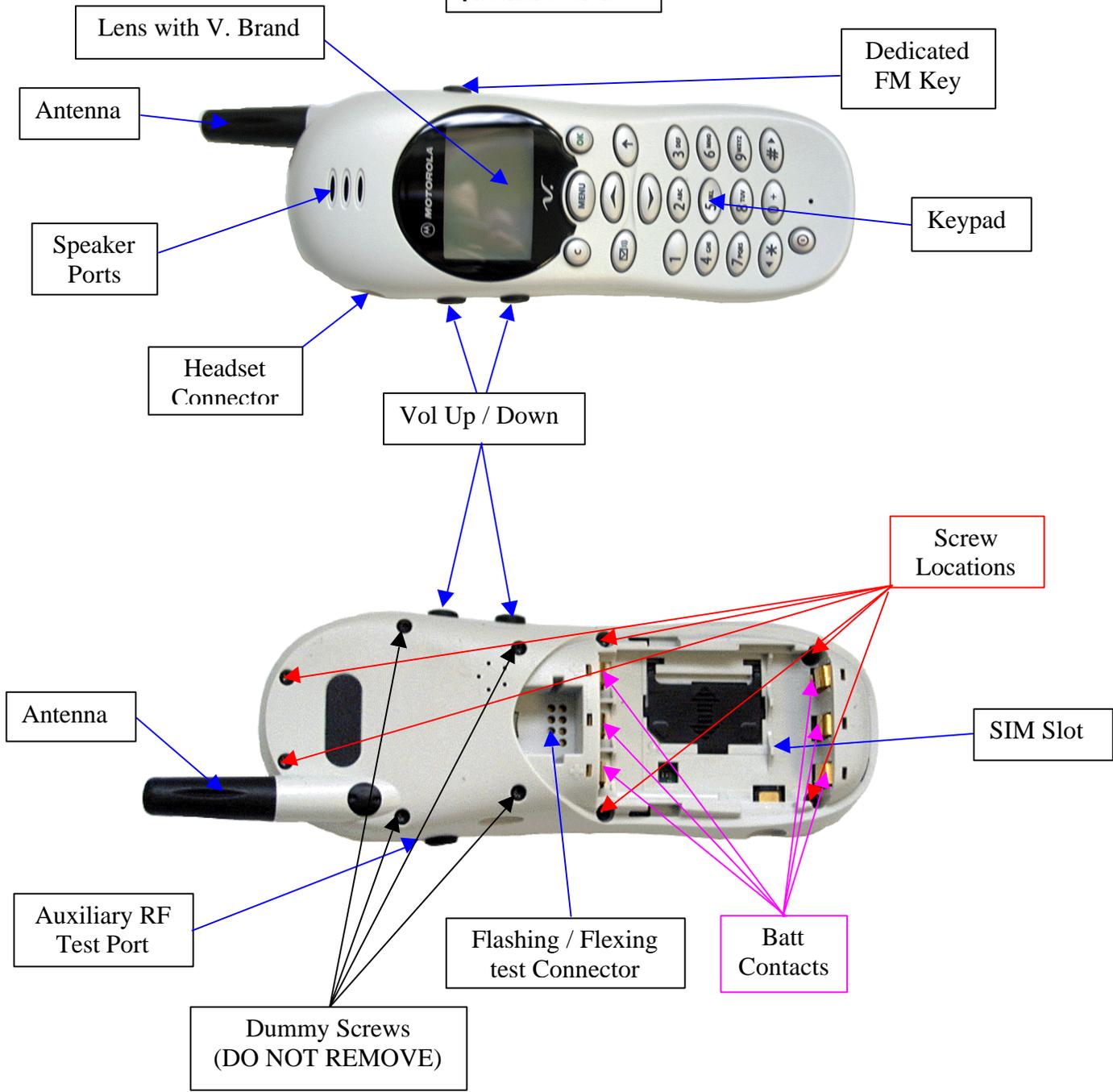
There will be 2 versions of this product the V2282 and the T2282

The V2282 will incorporate many new features that were, in the past unavailable.

These are:

- WAP with UP 3.1 Microbrowser – available through network provider to access all WML pages on the internet.
 - ⇒ The menu, with the aid of the soft icons will help guide the user to browse through most of the popular WML sites
 - ⇒ Only possible to download small images or icons
 - ⇒ Information cannot be saved as a file
- FM Radio
 - ⇒ V2282 will have two modes Phone/Radio
 - ⇒ Will power up in Phone mode
 - ⇒ When set to FM mode, Radio will camp and receive calls/SMS
 - ⇒ Separate volume control
 - ⇒ Channel seek up/down
 - ⇒ Fine Tuning
 - ⇒ 9 User defined pre-set channels
 - ⇒ Display will show radio station
 - ⇒ Receiver sensitivity -95dBm
 - ⇒ Selection of Mono / Stereo made by Headset
 - ⇒ Left / Right channel separation $>30\text{dB}$
- Integrated Headset – Mono or Stereo
- No external accessory connector – now removed, all flashing and flexing to be delivered through 8 pin socket in rear of phone below batteries
- External Charger Jack socket
- 96 X 64 Graphics Display with 13 Soft Icons
- Single Cell Ni MH Batteries
- Single Band GSM 1900
- SIM toolkit V2.2.0
- New Charger circuitry

Fig 2.1 Mechanical pictorial Overview



2.3 Connector Pinout

1 3 5 7
2 4 6 8



- 1- TP866 - GND
- 2- TP865 - B+
- 3- TP875 - ON*
- 4- TP877 - UPLINK
- 5- TP878 - DOWNLINK
- 6- TP864 - DSC_EN
- 7- TP1000 - 152KHz
- 8- TP1001 - FM_RSSI

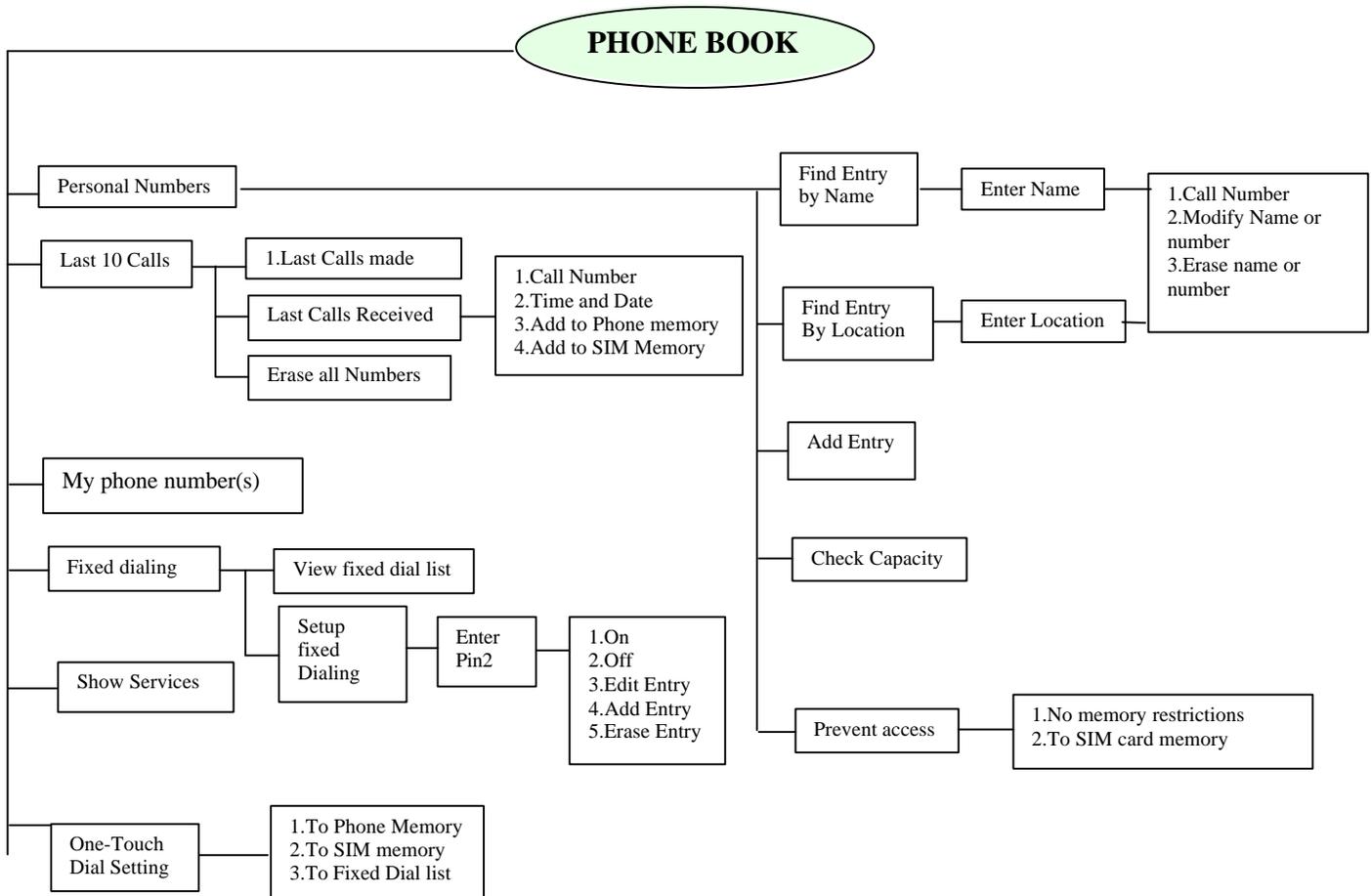
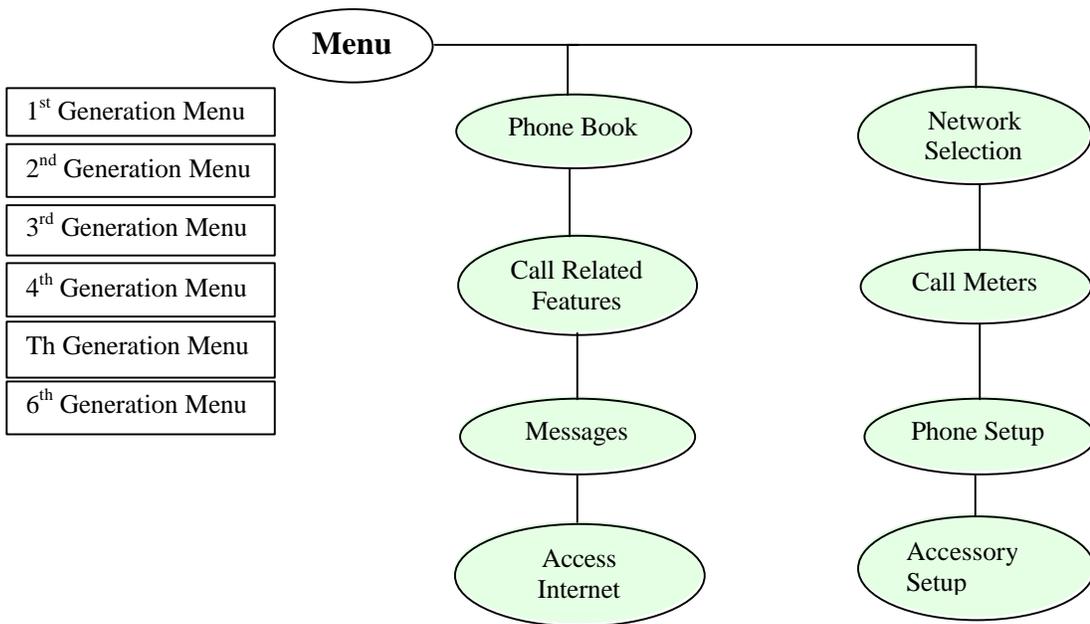
2.4 Talk Times, Weight, Dimensions and Volume Matrix

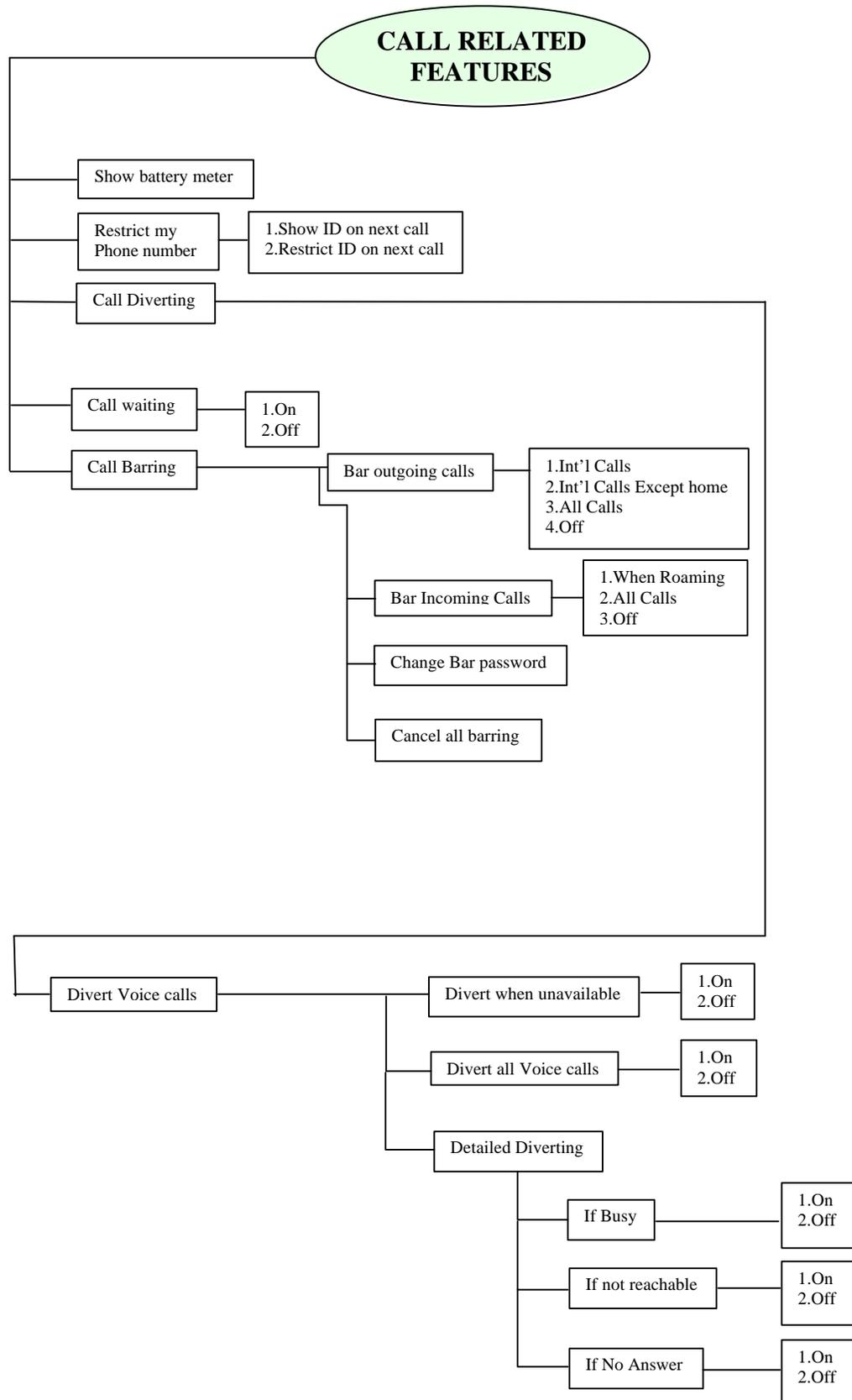
Volume (cubic cm)	Weight (grams)	Talk Time (minutes)	Standby time (hours)	Dimensions (mm)	With Battery type:
120	140	140	100	130 x 47 x 27	700 mAh AAAL NiMH Battery Cells

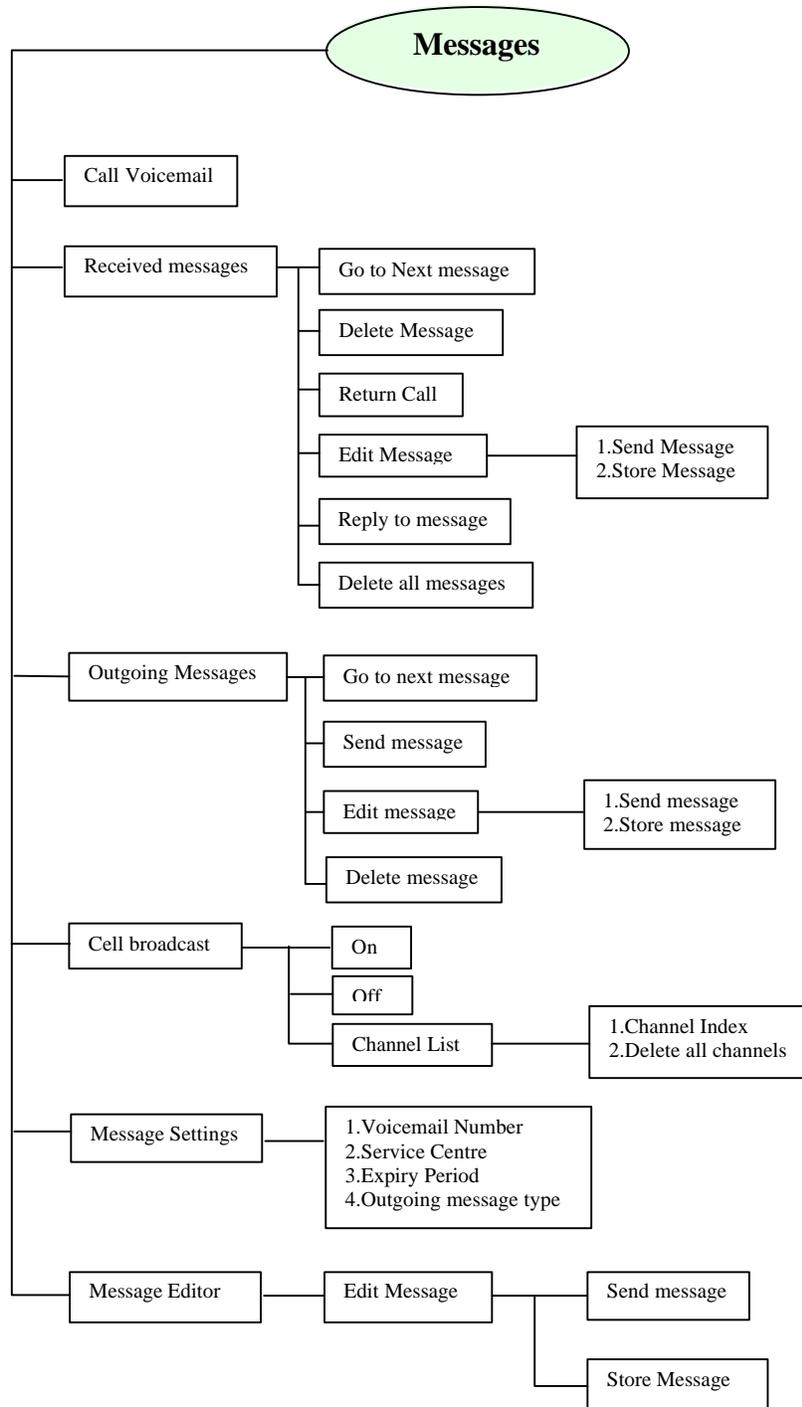
SECTION 3: FEATURE LIST

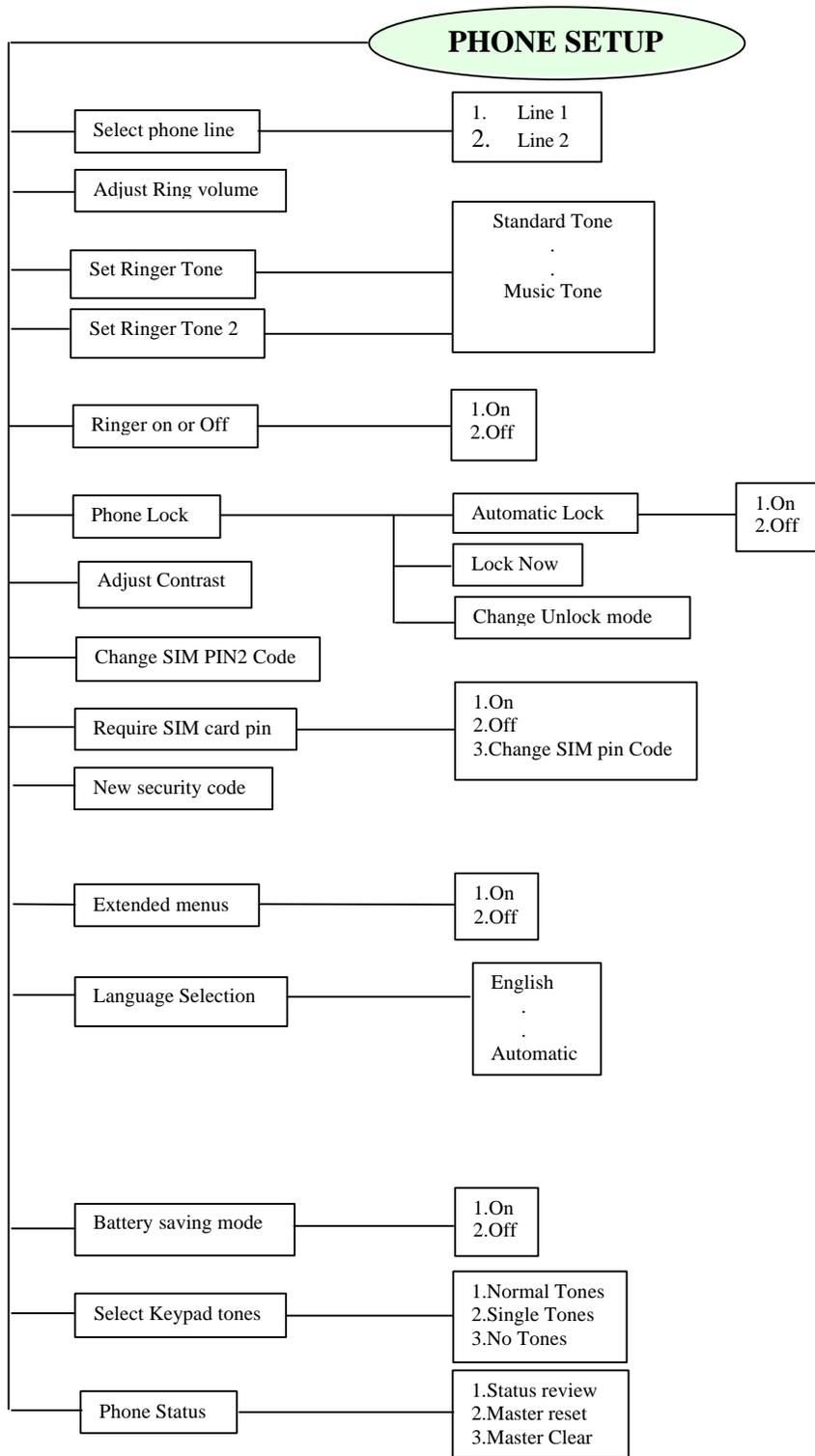
3.1 List of Features Available

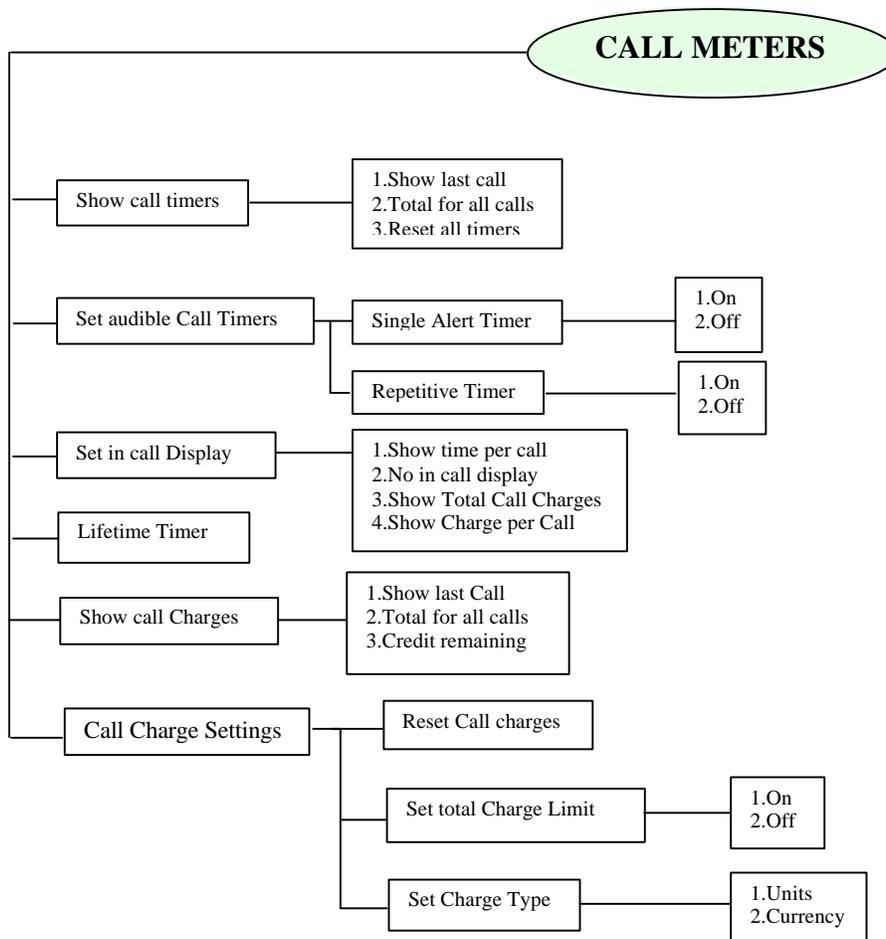
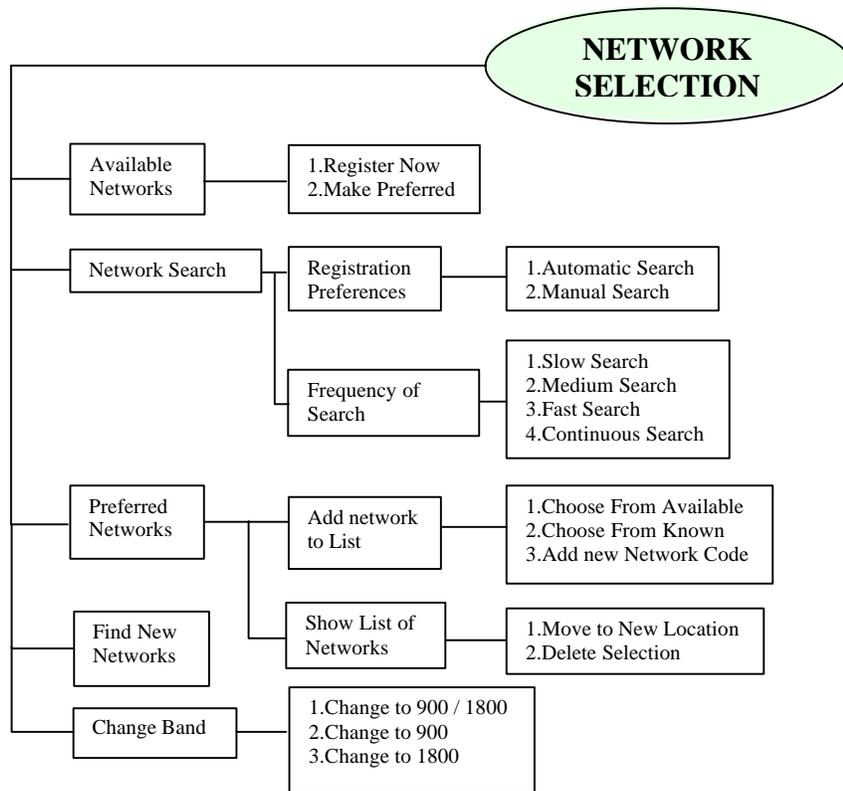
Below are the list of Menu functions available at present.





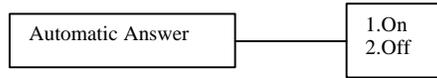






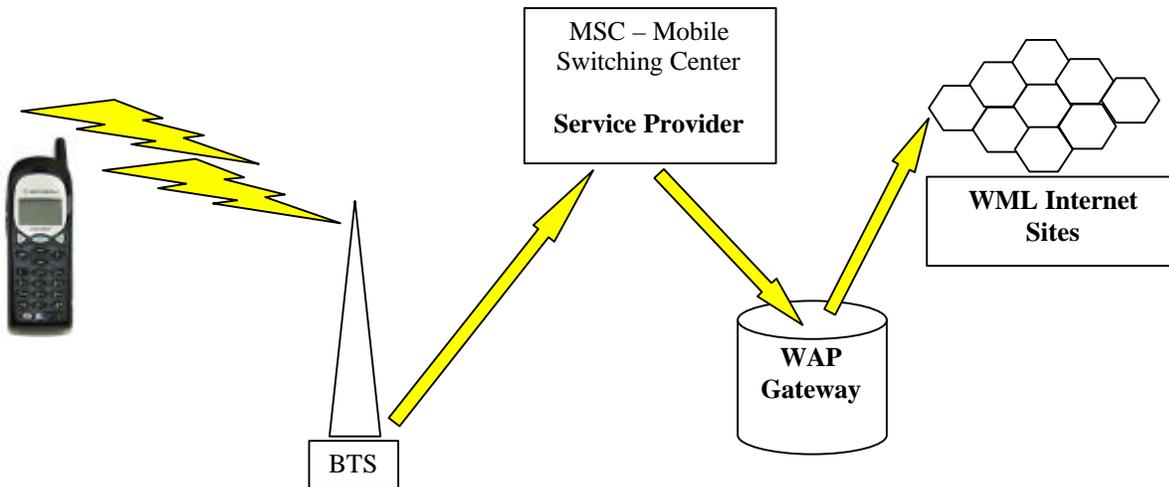
**ACCESSORY
SETUP**

NB. THIS MENU IS ONLY AVAILABLE WITH EITHER HEADSET PLUGGED IN OR WHEN INSTALLED IN A CAR KIT.



WAP ACCESS

WAP – Wireless Application Protocol: THIS IS A NETWORK AND SUBSCRIPTION-DEPENDANT FEATURE THAT WILL NOT WORK WITHOUT PRE ARRANGEMENT WITH THE NETWORK PROVIDER. ALSO WAP ON THE V2282 CAN ONLY ACCESS WML PAGES (WML, a different mark up language to HTML) AND CAN ONLY DOWNLOAD AND DISPLAY SMALL GRAPHICS AND IMAGES.

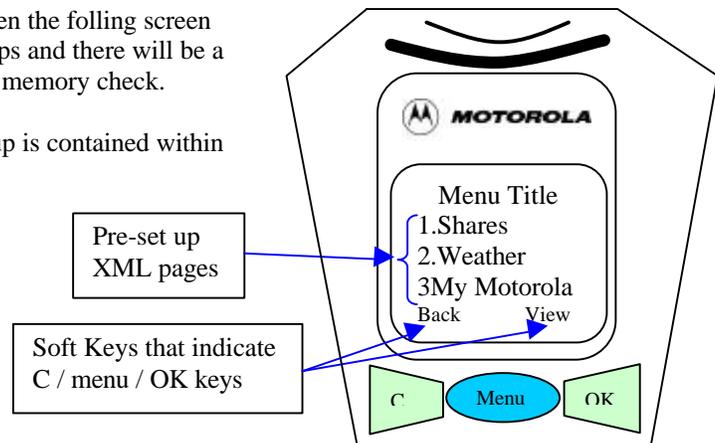


As can be seen, there are various stages through the path that access must be obtained either through the network provider or / and the internet access provider (WAP Gateway).

WAP access will be the first item upon pressing the menu key. From this point on the soft propts above the top row of keys will be your guide i.e the cancel button will now be the 'back' button not the cancel button.

On accessing the WAP menu you will be given the following screen
The access baud rate is at the standard 9600bps and there will be a Password check as well as a internal security memory check.

All information on setting the WAP session up is contained within the user manual.



SECTION 4: DISASSEMBLY & PARTS

4.1 Disassembly Introduction

The V2282 is held together by 6 screws, 2 uppermost and 4 within the battery casing.

NOTE: DO NOT TRY TO REMOVE THE 4 SCREWS, BELOW THE 2 UPPERMOST SCREWS AS THESE ARE FALSE SCREWS AND ONLY FOR APPEARANCE

Ensure care is taken when removing the LCD from the main PCB as the flex is very delicate and can be easily damaged.

Ensure that a properly grounded high impedance conductive wrist strap is used whilst performing any tasks during the disassembly and assembly of the unit

Avoid stressing the plastics in any way to avoid damage to either the plastics or internal components.

!! CAUTION !!

Many of the integrated devices used in this equipment are vulnerable to damage from electro-static charges. Ensure that adequate static protection is in place when handling, shipping and servicing the internal components of this equipment.

4.2 Recommended Tools

The following tools are recommended for use during the assembly / disassembly of the V2282.

- Anti-static Mat Kit - 0180386A82, includes:
 - Antistatic mat 66-80387A95*
 - Ground Cord 66-80334B36*
 - Wrist Band 42-80385A59*
- Plastic Bladed Tool SLN7223A
- T6 Torx Driver

4.3 Disassembly Procedure

The following set of diagrams will demonstrate the correct sequence and action required to disassemble the V2282

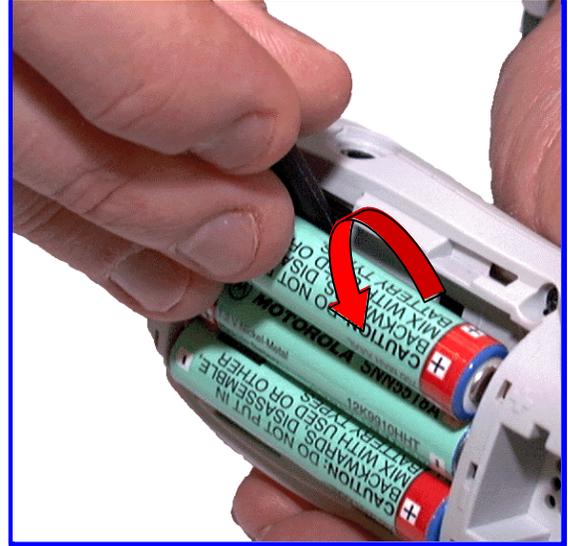
The use of the exploded diagram on page **19 and 20** may be of some assistance for part recognition.

4.4 Assembly Procedure

Once the unit is disassembled and the repair is carried out, the unit must then be reassembled, this is carried out in the exact reverse order as the disassembly.



1. Remove battery door by pressing down on latch and pulling back



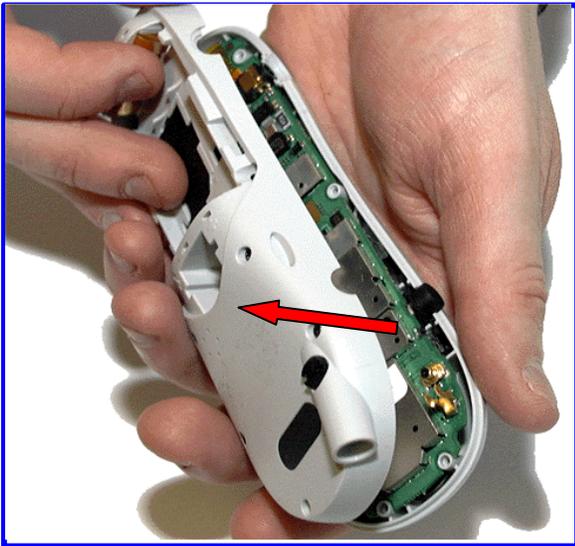
2. Remove Batteries



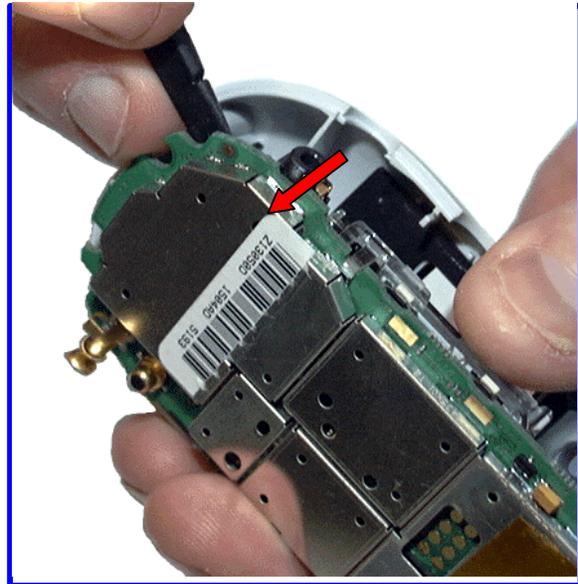
3. Remove antenna by rotating anti-clockwise



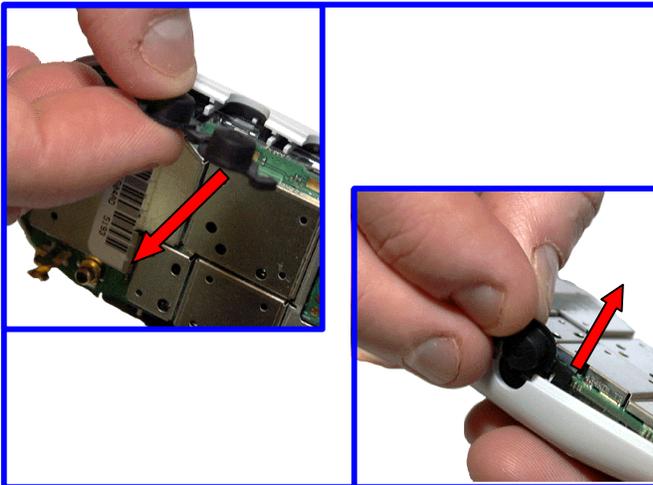
4. Unscrew 6 retaining screws using T6 Torx driver – find screw locations on page 4



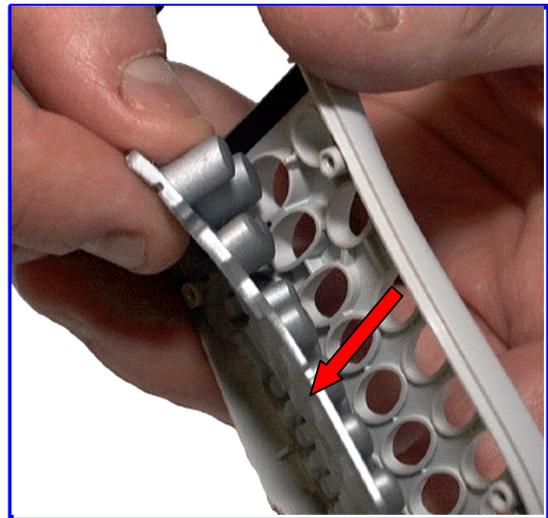
5. Remove rear housing from unit.



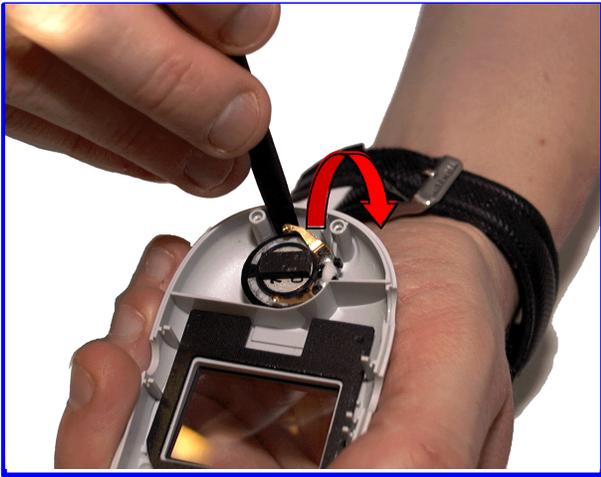
6. Slide plastic tool in between front housing and PCB and prise PCB out.



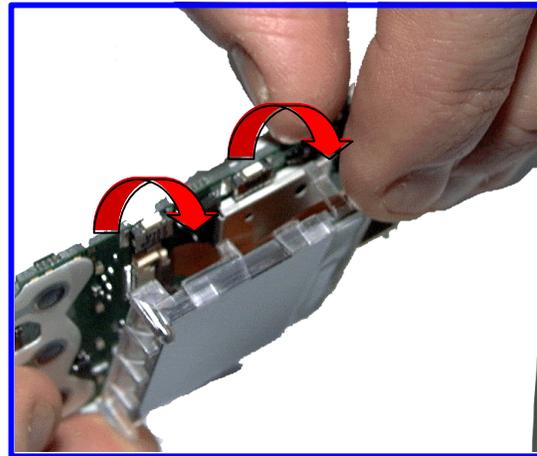
7. Remove the Volume buttons and FM Radio button from side of the unit.



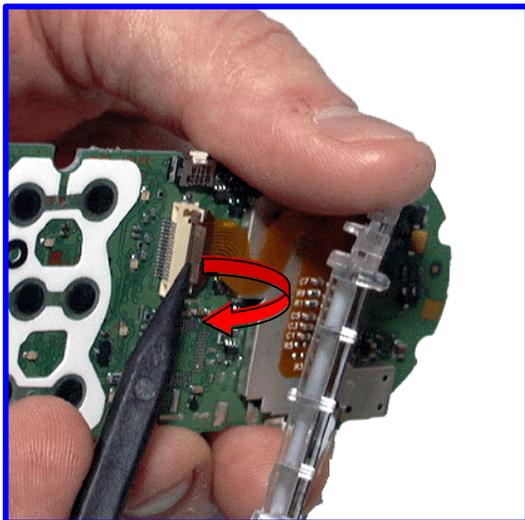
8. Remove Keypad



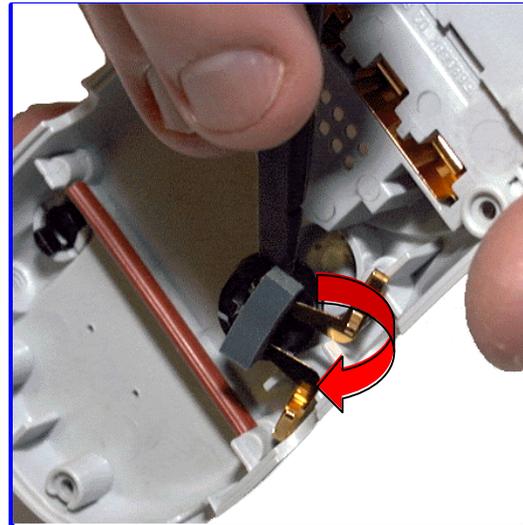
9. Remove speaker from front housing



10. Carefully prise display LCD from main board by releasing catches on each side of LCD frame



11. Carefully lift the flip of the ZIF connector and remove the flex. Note: The flex is very fragile.



12. Remove the alert by sliding the plastic tool below the alert speaker and prizing upwards

4.5 Exploded Parts Diagram SUG0097AA



4.5 Replacement Parts

Xcvr Item Number		SUG0097AA	Display Assy	9	SYN8131A
Spare Xcvr Number	1	SA1014AQV3B1	Keypad	10	3885692K01
Flip	2	0185815K03	SIM card holder	11	0187436K01
Front Housing	3	0185686K01	Alert Grommet	12	0585852K01
Rear Housing	4	0185848K01	Mic	13	5009135L07
R-side Cam Shaft	5		Mic Grommet	14	0585853K01
L- side Cam shaft	6		Flex Cover	15	5403801S01
R-Hinge Cover	7	4709038K02			
Stubby Antenna	8				

SECTION 5: SIM CARDS AND SECURITY

5.1 Manual Test Mode

The GSM Motorola V2282 is equipped with a manual test mode capability. This capability allows service personnel to take control of the unit, and by entering certain keypad commands, make the unit performs desired functions.

To enter the manual test command mode, a GSM / DCS mini test sim (Part No 8102430Z04) must be used.

The test sim is inserted into the SIM slot in the side of the phone (See **figure 6.1**), the battery should then be inserted and the unit powered on. The # button should then be pressed for approximately 3 second until 'test' appears on the display, and the correct commands must then be followed.

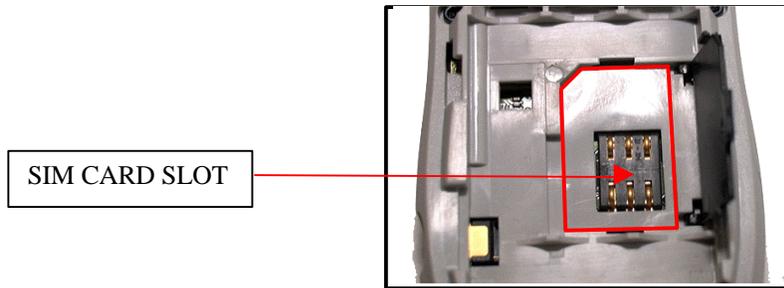


Figure 6.1 SIM Card insertion

5.2 Live Sim Card

A SIM (Subscriber Identity module) card will be required to access the existing local GSM / DCS cellular network, or remote networks when travelling. (If the roaming agreement has been made with the provider.)

The SIM card contains all the data necessary to access GSM services, and also:

- The ability to store user information such as phone numbers etc...
- All information required by the network provider to provide use to the network

5.3 Personality Transfer

No personality transfer available on this product.

5.4 GSM Test Commands

This is a list of Level 1 and 2 Test commands available to V2282

Table 5.1 Test commands **GSM Test Commands**

<i>Key Sequence</i>	<i>Test Function/Name</i>
#(hold down for 2 seconds)	Enter manual test mode
01#	Exit manual test mode
07#	Mute RX audio path
08#	Unmute RX audio path
09#	Mute TX audio path
10#	Unmute TX audio path
15xx#	Generate tone
16#	Mute tone generator
19#	Display S/W version number of Call Processor
20#	Display S/W version number of Modem DSP
22#	Display S/W version of Speech Coder
27x#	Display IP, SIM TK, WAP and AT Parser Command MMI Software Rev
36# or 36x#	Initiate acoustic loopback
37#	Stop test
38#	Activate Mini SIM
39#	Deactivate Mini SIM
43x#	Change audio path
51#	Enable sidetone
52#	Disable sidetone
54X#	Show Service Indicator LED 0 - Off / 1 - Red / 2 - Green / 3 - Amber
571#	Initialize non-volatile memory
58#	Display security code
58xxxxxx#	Modify security code
59#	Display lock code
59xxx# or 59xxxx#	Modify lock code
60#	Display IMEI
88#	Display / Set Real time clock
92#	Stop Voice annotation
980# / 981#	DCS / GSM mode
99#	Display all display pixels

36XX#

0 or Omitted	Full Rate
1	Enhanced Full rate
2	Half Rate

5.5 Identity and Security

Each Motorola V2282 will be labelled with various number configurations. The following information describes what these configurations mean.

MSN

The mechanical Serial Number (MSN) is an individual unit identity number and will remain with the unit throughout the life of the unit.

The MSN can be used to log and track a unit on Motorola’s EPPRS system.

The MSN is divided into 4 sections.

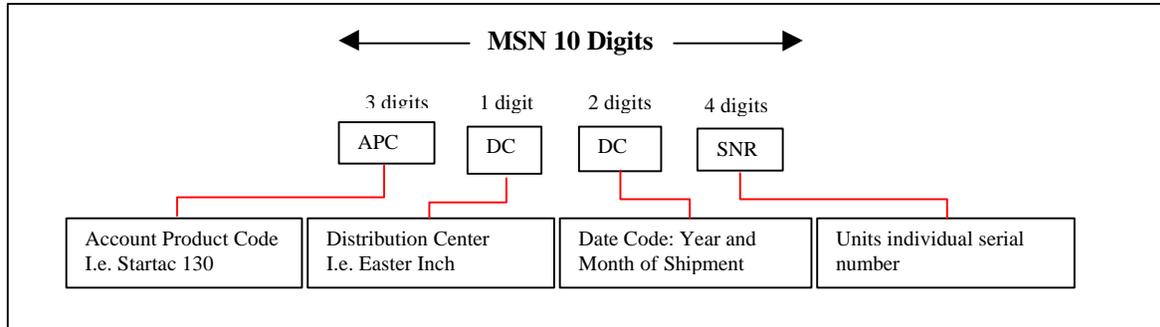


Figure 5.2 MSN label breakdown

IMEI

The International Mobile station Equipment Identity (IMEI) number is an individual number unique to the PCB and is stored within the unit’s memory. The following figure gives a description of the make up of this number.

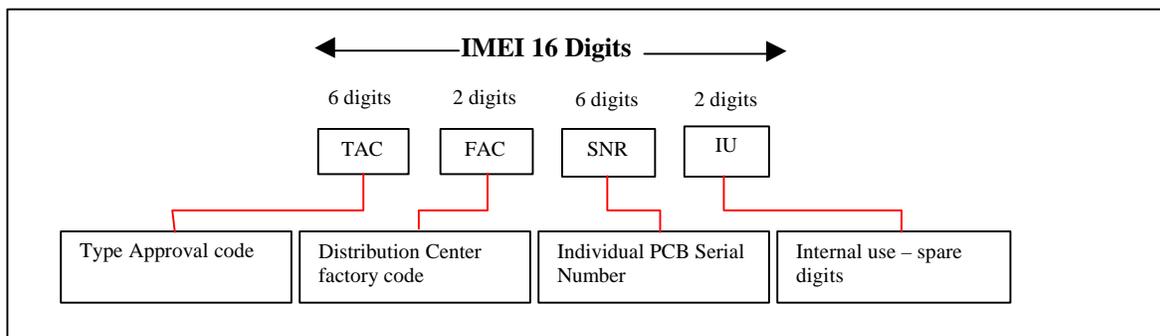


Figure 5.3 IMEI label breakdown

Some other label number configurations that will be present will be: -

XCVR NUMBER: Identifies type of product. i.e. V2282 (Usually SWF number)

PACKAGE NUMBER: Determines type of equipment, mode in which it was shipped and language with which it was shipped.

SECTION 6: REPAIR AND TEST PROCEDURES

6.1 Repair Introduction

The V2282 is divided into 3 main sections when it comes to part replacability: The Flip which contains the speaker,battery connections, RTC battery and Vibrator. The housings that contain the main PCB which contains RF / Logic circuitry. The third component is the the keypad and Display Assy. If the RF / Logic board is required to be changed then a full service transceiver should be ordered as there is no replacement PCB available. Also a personality transfer would be necessary.

6.2 Mechanical repairs

Assembly replacement level troubleshooting and repair of the V2282 is limited to isolation and replacement of the main mechanical parts only (See Exploded parts diagram and associated parts list)

6.3 Basic Modular Troubleshooting

The troubleshooting information in **Table 2** shows some typical malfunction symptoms, and for the corresponding verification and repair procedures refer to the disassembly instructions located in the disassembly section of this manual. (**Section 5**).

NOTE

Defective Logic/RF assemblies must be replaced with pre-tested, pre-phased assemblies

6.4 Repair Chart

Table 2. GSM V2282 Cellular Telephone: Troubleshooting and Repair Chart. (Assembly Replacement Level).

SYMPTOM	PROBABLE CAUSE	VERIFICATION AND REMEDY
Personal telephone will not turn on or stay on	a) Battery pack either discharged or defective	Replace batteries with known good cells. Power unit on. If unit powers on OK replace batteries. If battery is not at fault, proceed to b.
	b) Battery connectors open or misaligned.	Visually inspect the battery connectors on the rear housing top and bottom. Check for bad alignment or dirty contacts. Re-align, clean and, if necessary, replace the rear housing. If battery connectors are not at fault, proceed to c
	c) Logic/RF Board Assembly Defective.	Remove the Logic/RF Assembly. Substitute a known good assembly and temporarily reassemble the unit. Depress the PWR button; if unit turns on and stays on, disconnect the dc power source and reassemble the telephone with the new Logic/RF Board assembly. If unit does not power up proceed to d)
	d) Display circuit failure	Disassemble unit and remove LCD module and insert known good module. Insert Battery and depress PWR button. Ensure unit stays on, if OK reassemble unit in new housing assembly
2. Personal telephone exhibits poor reception and/or erratic operation (such as calls frequently dropping, weak and/or distorted audio, etc.).	a) Antenna is defective	Check to make sure that the antenna is properly inserted into the front housing. If OK, substitute a known good antenna. If the fault is still present, proceed to b.
	b) Logic/RF Board Assembly Defective.	Replace Logic/RF Assembly (refer to symptom 1c). Verify that the fault has been cleared and Re-assemble the unit with the new PCB.
3. Display is erratic, or provides Partial or no display.	a) Mating connections to / from Display PCB.	Dissassemble unit, and remove display module from main PCB, check connector for any signs of corrosion or damage. If damaged proceed to c)
	b) Display Module is Defective.	Substitute a known good Display Module onto the suspect main board and connect to DC Pwr supply depress PWR and ensure display is now correct, If Ok rebuild unit with new Display assembly. If display assembly is not at fault proceed to c.
	c) Logic/RF Board Assembly Defective.	Replace Logic/RF Assembly (refer to symptom 1c). Verify that the fault has been cleared and Re-assemble the unit with the new PCB.

SYMPTOM	PROBABLE CAUSE	VERIFICATION AND REMEDY
4. Incoming call alert transducer audio, distorted or volume is too low.	a) Faulty alert Transducer	Replace Alert Transducer from rear housing refer to disassembly procedure.If not Alert then proceed to b)
	b)Main RF / Logic PCB defective	Replace Logic/RF Board Assembly (refer to symptom 1c). Verify that the fault has been cleared and re-assemble the unit with the new PCB.
5. Personal telephone transmit audio is weak, (usually indicated by called parties complaining of difficulty in hearing voice from personal phone).	a) Microphone connections to the main RF / Logic board are defective.	Gain access to the Microphone as described in the DISASSEMBLY instructions in this manual. . Check connections. If connector is faulty proceed to c if the connector is OK, proceed to b.
	b) Microphone defective	Gain access to microphone .Disconnect and substitute a known good Microphone. Place a call and verify as heard by called party. If good, re-assemble unit with new Microphone. If Microphone is not at fault, re-install original Microphone and proceed to c.
	c) Logic/RF Board Assembly defective.	Replace Logic/RF Board Assembly (refer to symptom 1c). Verify that the fault has been cleared and re-assemble the unit with the new PCB.
6. Personal telephone receive audio is weak and/or distorted. (From speaker)	Dirty Contacts / Misalignment of contacts or faulty speaker.	Ensure pads on PCB are clean and that speaker contacts are sat almost vertical to each other. If Ok replace with known good speaker and check for call quality. If still poor proceed to c)
	c) Antenna assembly is defective.	Attempt a re-phasing of the unit and recheck the symptom. If symptom is the same but unit re-phases correctly, check to make sure the antenna connector is correctly soldered to the main board and that the antenna is fitted correctly. If ok, substitute a known good antenna assembly. If this does not cure the fault, re-install the original antenna then proceed to d).
	d) Logic/RF Board Assembly Defective.	d) Replace Logic/RF Assembly (refer to symptom 1c). Verify that the fault has been cleared and Re-assemble the unit with the new PCB.
7. Personal telephone will not recognize/accept SIM card	a) SIM card defective	Initially check that the contacts on the card are not dirty. Clean if necessary, and check if fault has been eliminated. If the contacts are clean, insert a Known good SIM card into the unit. Power up the unit and confirm whether or not the card has been accepted. If the fault no longer exists, the defective SIM card should be replaced. If the SIM card is not at fault, proceed to b.
	c) Logic/RF Board Assembly Defective.	Replace Logic/RF Board Assembly (refer to symptom 1c). Verify that the fault has been cleared and re-assemble the unit with the new PCB.

SYMPTOM	PROBABLE CAUSE	VERIFICATION AND REMEDY
9. Internal Charger not working	a) Batteries faulty	Replace suspect batteries with known good items. Insert charger and ensure battrey charging icon flashes if OK, replace batteries if batteries still do not charge proceed to b)
	a) Faulty charger circuit on main board defective	Replace Logic/RF Board Assembly (refer to symptom 1c). Verify that the fault has been cleared and re-assemble the unit with the new PCB.
10. No / Weak audio when using	a) Headset not fully pushed	Fully ensure the 'click' is felt on the jack socket. If

headset	home or defective	Ok Change Headset If still no audio proceed to b)
	b) Faulty Jack Socket / Defective PCB	Replace Logic/RF Board Assembly (refer to symptom 1c). Verify that the fault has been cleared and re-assemble the unit with the new PCB.
11. FM Radio is not working	a) Headset not fully pushed home or defective	Fully ensure the 'click' is felt on the jack socket. If Ok Change Headset If still no audio proceed to b)
	b) Faulty FM Button or FM Circuit on main PCB defective.	Replace Logic/RF Board Assembly (refer to symptom 1c). Verify that the fault has been cleared and re-assemble the unit with the new PCB.

6.5 Software Upgrade

For information on setting up and equipment required for the flashing of software, contact should be made with the local technical support engineer.

6.6 Flexing

For information on setting up and equipment for flexing, contact should be made with the local technical support engineer.

6.7 Testing on HP8922

For the V2282 a completely different connector to all previous models, the only external connectors to the customer are the Headset connector and the charger socket. For test the connector shown is used flashing and flexing and the auxiliary port is used for RF tests.



Fig 6.1 V2282 External Socket



Fig 6.2 Flashing / Flex cable



Fig 6.3 Flash Cable (with Power leads)



Fig 6.4 V2282 Aux RF Connector.

SECTION 7: ACCESSORIES

7.1 Introduction

Included in this page are:

- Batteries
- Battery Door
- Belt Clip
- Boot
- Car Clip
- Easy-Install Car Kit
- Headset
- Pro-Install Car Kit
- Travel Charger
- Vehicle Power Adaptor

Accessory	Description	Part Number
Batteries	AAA Long Battery 700 mAh NiMH (Q/A: 3)	SNN5542
	AAA Long Battery 700 mAh NiMH (Q/A: 3)-China	SNN5541
	AAA Long Battery 700 mAh NiMH (Q/A: 3)-Portugese	SNN5540
	NOTE: Q/A = Quantity per Assembly	
Battery Door	Battery Door - Z Look	SHN7282A
	Battery Door - R Look	SHN7426A
Travel Charger	350 mAh Economy Travel Charger (Fixed Plug):	
	Argentina	SPN4678A
	Australia	SPN4683A
	Brazil 220V	SPN4679A
	Brazil 110V	SPN4707A
	China (w/o holes in the blades)	SPN4677A
	Euro	SPN4682A
	India (5 Amp)	SPN4684A
	U.K.	SPN4680A
	U.S.	SPN4681A

Belt Clip	Belt Clip-On System - Z Look		SYN8092A
	Belt Clip-On System - R Look		TBD
VPA	Vehicle Power Adapter (Dual Current)		SYN8087A
Easy-Install Car Kit	Easy-Install Hands Free Car Kit (Analog Audio)		SYN8088A
Car Clip	Car Clip (Phone Holder) compatible w/Belt Clip-On System		SYN8184A
Headset	Boom Headset		SYN8146A
	Earbud Headset	Blue Pouch	SYN6962A
		Jewel Case	SYN7453A
		Plastic Bag	SYN8390A
	Retractable Headset		SYN8284A
	Stereo Headset		SYN8284A
	Headset (Mono)		SYN6962A
	Stereo for FM Radio (for GSM R look only)		SYN8086A
Boot	Rubber Boot- R Look		SYNXXXXX

Added since Initial manual Release:

- PAK2070/1 POWER PACK 700 (INCLUDES FREE CHARGER)
- HSK9000 STANDARD HEADSET
- Hsk9500 BOOM MIC HEADSET
- HFK2100 BASIC CAR KIT WITH HEADSET

Available Jan / Feb:

- CLA2000 IN-CAR CHARGER – JAN
- HSK 9300 RETRACTABLE HEADSET
- HFK2000 EASY INSTALL HANDSFREE CAR KIT
- CCA2000 SMART CLIP (INC CAR PLATE)

Available March:

- CCA220X NEOPRENE CASES
- TBC LEATHER CASE

SECTION 8: SALES MODELS

8.1 List of Available Sales models by Country

Australia SA1306AB1B1 (V-Dot, Black, SIM) V0
Australia SA1293AB1B1 (Talkabout, Black, SIM) V0
Euro Pkg1 SA1307AB1B1 (V-Dot, Black, Cambodia,
Indonesia, Laos, Pakistan, Sri Lanka, Vietnam) V0
Euro Pkg1 SA1294AB1B1 (Talkabout, Black,
Cambodia, Indonesia, Laos, Pakistan, Sri Lanka, Vietnam) V0
Euro Pkg2 SA1308AB1B1 (V-Dot, Black, Bangladesh, Brunei, Mauritius) V0
Euro Pkg2 SA1295AB1B1 (Talkabout, Black,
Bangladesh, Brunei, Mauritius) V0
Hong Kong SA1363AB1X1 (V-Dot, Black) V1
Hong Kong SA1360AB1X1 (Talkabout, Black) V4
India SA1309AB1B1 (V-Dot, Black) V0
India SA1296AB1B1 (Talkabout, Black) V0
New Zealand SA1310AB1B1 (V-Dot, Black) V0
New Zealand SA1297AB1B1 (Talkabout, Black) V0
Philippines SA1311AB1B1 (V-Dot, Black) V0
Philippines SA1298AB1B1 (Talkabout, Black) V0
Plain Package SA1312AB1B1 (V-Dot, Black) V0
Plain Package SA1299AB1B1 (Talkabout, Black) V0
PRC SA1362AB1X2 (Talkabout, Black) V2
Singapore SA1313AB1B1 (V-Dot, Black) V0
Singapore SA1300AB1B1 (Talkabout, Black) V0
Thailand SA1315AB1B1 (V-Dot, Black, SIM/AIS) V0
Thailand SA1302AB1B1 (Talkabout, Black, SIM/AIS) V0
Thailand SA1314AB1B1 (V-Dot, Black, SIM/TAC) V0
Thailand SA1301AB1B1 (Talkabout, Black, SIM/TAC) V0

SECTION 9: GLOSSARY OF TERMS

9.1 List of Abbreviations

Those marked ** are Motorola specific abbreviations.

A Interface	Interface between MSC and BSS
A3	Authentication algorithm
A5	Stream cipher algorithm
A8	ciphering key generating algorithm
AB	Access Burst
A-bis	Interface between BSC and BTS
ACCH	Associated Control Channel
ACSE	Association Control Service Element
AGCH	Access Grant Channel
AMPS	Advance Mobile Phone System
AOC	Advice of charge
ARFCN	Absolute Radio Frequency Channel Number
ARQ	Automatic Request for retransmission
ASIC	Application Specific Integrated Circuit
AUC	Authentication Center
AUT (H)	Authentication
BA	BCCH Allocation
BAIC	Barring of All Incoming Calls
BAOC	barring of all Outgoing Calls
BCC	Base Transceiver Station (BTS) Color Code
BCCH	Broadcast Control Channel
BCD	Binary Coded Decimal
BCU	BTS Control Unit **
Bm	Full-rate traffic channel
BN	Bit Number
BS	Base Station
BSC	Base Station Controller
BSIC	Base Transceiver Station Identity Code
BSS	Base Station System
BSSAP	BSS Application Part (DTAP and BSSMAP)
BSSC	Base Station System Control Cabinet **
BSSMAP	Base Station Systems Management Application Part
BSSOMAP	BSS Operation and Maintenance Application Part
BSU	Base Site Controller Unit **
BTS	Base Transceiver Station
CA	Call Allocation
CBCH	Call Broadcast Channel
cc	Call Control
cc	Country Code
CC	Cellular Cassette
CCBS	Completion of Calls to Busy Subscribers
CCH	Control Channel
CCCH	Common Control Channel
CDMA	Code Division Multiple Access
CFS	Call Forwarding on mobile Subscriber busy
CFU	Call Forwarding Unconditional
CLIP	Calling Line Identification Presentation
CLIR	Calling Line Identification Restriction
CM	Connection Management
COLP	Connected Line identification Presentation
COLR	Connected Line identification Restriction
CONF	Conference Call add on

CSPDN	Circuit Switched Public Data Network
CUG	Closed User Group
CW	Call Waiting
DB	Dummy Burst
DBS	Distributed Base Station **
DCCH	Dedicated Control Channel
DET	Detach
DFE	Decision Feedback Equalizer
DISC	Disconnect
DL	Data Link (layer)
Dm	Control Channel (ISDN terminology applied to mobile service)
Dm	Signaling channel
Dp	Dialed Pulse
DRCU	Diversity Radio Channel Unit**
DRX	Discontinuous Reception
DTAP	Direct Transfer Application Part
DTE	Data Terminal Equipment
DTMF	Dual Tone Multi-Frequency (tone signaling type)
DTX	Discontinuous Transmission
E	erlang
Eb/No	Energy per Bit/Noise floor
EC	Echo Canceller
Ec/No	Ratio of energy per modulating bit to the noise spectral density
EGSM	Extended Group special Mobile
EFR	Enhanced Full Rate
EIR	Equipment Identity Register
EIRP	Effective Isotropic Radiated Power
EMC	Electromagnetic Compatibility
EMX	Electronic Mobile Exchange **
ETSI	European Telecommunications Standards Institute
FACCH	Fast Associated Control channel
FACCH/F	Full rate Fast Associated Control channel
FACCH/H	Half rate fast Associated Control channel
FB	Frequency correction burst
FCCH	Frequency Correction Channel
FEC	Forward Error Correction
FN	Frame Number
FR	Full Rate
FTAM	File Transfer Access Management
GCC	Global Call Center
GMSC	Gateway Mobile Services Switching Center
GMSK	Gaussian Minimum Shift Keying
GSM	Group Special Mobile
GSM MS	GSM Mobile Station
GSM PLMN	GSM Public Land Mobile Network
HANDOVER	Handover
HDLC	High Level Data Link Control
HLR	Home Location Register
HOLD	Call Hold (Supplementary Service)
HPLMN	Home PLMN
HPU	Hand Portable Unit
HR	Half Rate
HSN	Hopping Sequence Number

I	Information (frames)
IA5	International Alphanumeric 5
ID	Identification
IMEI	International Mobile Equipment Identity
IMM	Immediate assignment message
IMSI	International Mobile Subscriber Identity
IN	Intelligent Network
INDY	Iridium 9500 handset
ISC	International Switching Center
ISU	Iridium Subscriber Unit
ISDN	Integrated Services Digital Network
ISUP	ISDN User Part
IWF	Interworking Function
Kc	ciphering Key
Ki	Individual subscriber authentication key
LAC	Location Area Code
LAI	Location Area Identification (Identity)
LAPB	Link Access Procedure 'B' (balanced) channel
LAPDm	Link Access Procedure 'DM' (mobile 'D') channel
Lm	Traffic channel (with capacity lower than Bm)
LPC	Linear Predictive Code
LR	Location Register
MA	Mobile Allocation
MAH	Mobile Access Hunting
MAI	Mobile Allocation Index
MAIO	Mobile Allocation Index Offset
MAP	Mobile Application Part
MCC	Mobile Country Code
MCI	Malicious Call Identification
MD	Mediation Device
ME	Mobile Equipment
MF	Multi-Frequency (tone signaling type)
MLSE	Maximum Likelihood Sequence Estimator
MM	Mobility Management
MMI	Man Machine Interface
MNC	Mobile Network Code
MO	Mobile Originated
MO/PP	Mobile Originated Point to Point messages
MoU	Memorandum of Understanding
MRN	Mobile Roaming Number
MS	Mobile Station
MSC	Mobile Services Switching Center
MSCM	Mobile Station Class Mark
MSIN	Mobile Station Identification Number
MSISDN	Mobile Station international ISDN number
MSRN	Mobile Station Roaming Number
MT	Mobile Termination
MTP	Message Transfer Part
MT/PP	Mobile Terminated Point to Point messages
NAMPS	North American-Advance Mobile Phone System
NB	Normal Burst
NE	Network Elements

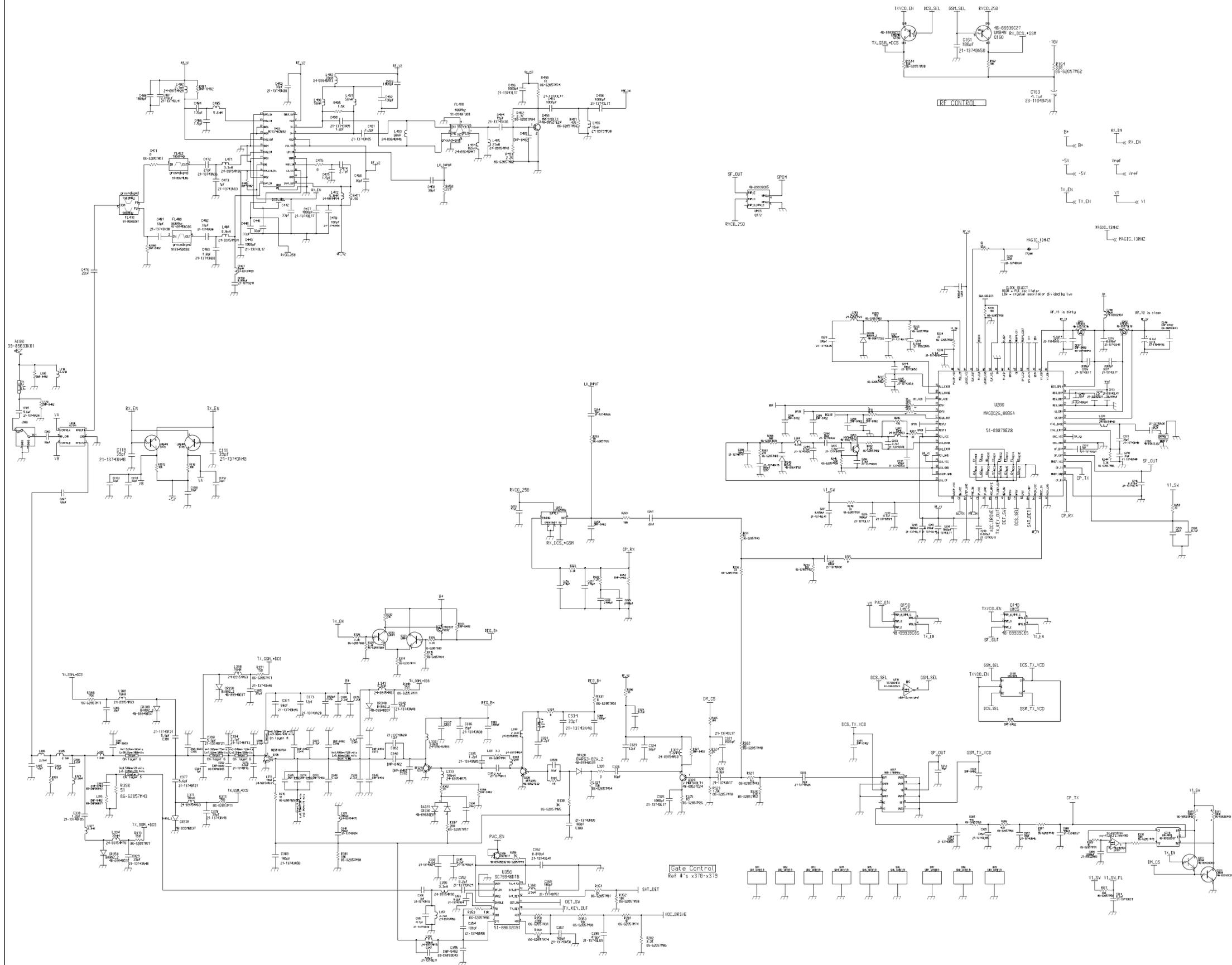
NET	Norme European de Telecommunications
NM	Network Management
NHC	Network Management Center
O&M	Operations and Maintenance
OACSU	Off Air Call Set-Up
OCB	Outgoing Calls Barred
OMAP	Operations and Maintenance Application Part (previously was OAMP)
OMC	Operations and Maintenance Center
OMCR	Operations and Maintenance Center -Radio Part
OMCS	Operations and Maintenance Center -Switch Part
OTA	Over The Air Programming
OSI	Open System Interconnection
PAD	Packet Assembly Disassembly facility
PCH	Paging Channel
PDN	Public Data Networks
PIN	Personal Identification Number
PLMN	Public Land Mobile Network
POTS	Plain Old Telephone Service (basic telephone services)
PSPDN	Public Switched Packet Data Network
PSTN	Public Switched Telephone
PTO	Public Telecommunications Operator
QOS	Quality of Service
RAB	Random Access Burst
RACH	Random Access Channel
RBDS	Remote BSS Diagnostic Subsystem **
RBUS	Remote Base Station Unit (PCN) **
RCU	Radio Channel Unit **
REC	Recommendation
REL	Release
RELPLTP	Regular Pulse Excitation - Long Term Prediction
REQ	Request
RFCH	Radio Frequency Channel
RFN	Reduced TDMA Frame Number
RLP	Radio Link Protocol
ROSE	Remote Operations Service Element (a CCITT specification for O&M)
RXCDR	Remote Transcoder Unit **
RXLEV	Received signal level
RXQUAL	Received signal quality
SABM	Set Asynchronous Balance Model
SACCH	Slow Associated Control Channel
SAPI	Service Access Point Indicator (Identifier)
SB	Synchronization Burst
SC	Service Center
SCCP	Signaling Connection Control Part
SCH	Synchronization Channel
SCP	Service Control Point - an intelligent network entity
SDCCH	Stand-alone Dedicated Control Channel
SDL	Specification Description Language
SFH	Slow Frequency Hopping
SIM	Subscriber Identity Module
SMS	Short Message Service
SMSCB	Short Message Service Call Broadcast
SND	SeND

SP	Signaling Point
SRES	Signed RESponse (authentication)
SS	Supplementary Service
SS	System Simulator
STP	Signaling Transfer Point
SYSGEN	SYStem GENeration
TA	Terminal Adapter
TA	Timing Advance
TCAP	Transaction Capabilities Application Part
TCH	Traffic Channel
TCH/F	A full rate TCH
TCH/FS	A full rate speech TCH
TCH/HS	A half rate speech TCH
TCP	Transmission Control Protocol
TDMA	Time Division Multiple Access
TE	Terminal Equipment
TMN	Telecommunications Management Network
TMSI	Temporary Mobile Subscriber Identity
TN	Timeslot Number
TRX	Transceivers
TTY	TeleTYpe (refers to any terminal)
TS	Time Slot
TUP	Telephone Users Part
UI	Unnumbered Information frame
Um	Air Interface
VAD	Voice Activity Detection
VLR	Visited Location Register
VLSI	Very Large Scale Integration (IC)
VPLMN	Visited PLMN
XC	Transcoder
XCDR	Transcoder **
3PTY	Three party service

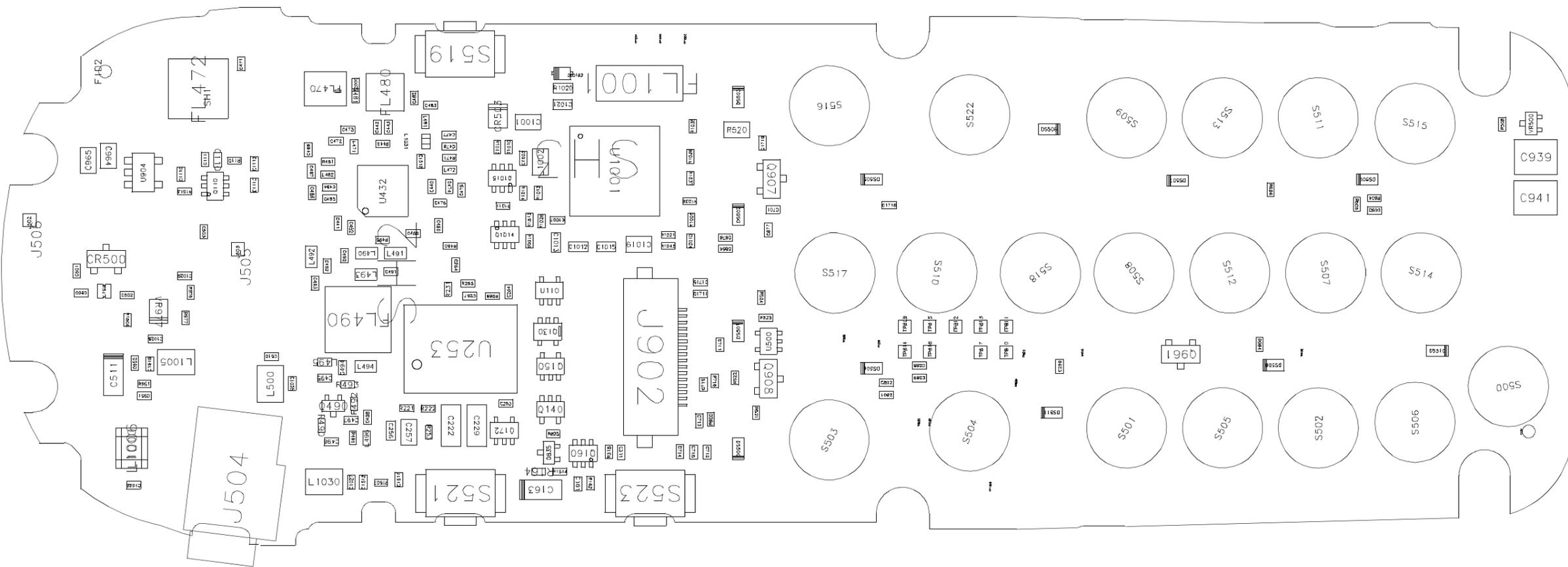
V2282 - RF SCHEMATICS

BOARD ELECTRICAL STACK UP

1	RF CONTROL LAYER 1	50 Ohm microstrip on layer 1 w/ 8 mil ground plane is 0.40 mm wide
2	RF LINES LAYER 2	50 Ohm microstrip on layer 2 w/ 10 mil ground plane is 0.70 mm wide
3	RF LINES LAYER 3	50 Ohm strip line on layer 3 is 0.70 mm wide
4	RF LINES LAYER 4	50 Ohm strip line on layer 4 is 0.70 mm wide
5	RF LINES LAYER 5	50 Ohm strip line on layer 5 is 0.70 mm wide
6	RF LINES LAYER 6	50 Ohm microstrip on layer 6 w/ 8 mil ground plane is 0.40 mm wide
7	RF LINES LAYER 7	50 Ohm microstrip on layer 7 w/ 10 mil ground plane is 0.70 mm wide



SCALE 4:1



V2282 - FM SCHEMATICS

