MOTOROLA
Cellular Subscriber Sector

V3682

Level III Service Manual

Single Band 1900 MHz GSM

CONTENTS

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 V3682, 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: -

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

1.2 Motorola Service Policy for V3682 in warranty

1.2.1 Warranty:

Product will be sold with the standard 12 months warranty terms and conditions. Accidental damage, misuse, and retailers extended warranties will not be supported under warranty. Non warranty repairs will be available at agreed fixed repair prices. Refer to the latest version of CSB 235 for details. Proof of purchase will be required to validate warranty claims.

1.2.2 Out of Box Failure Policy

Refer to the latest version of CSB 270 for the definition of Out of Box Failures, and for specific instructions.

1.2.3 Product Support

Customers original units will be repaired but not refurbished as standard. Level I shops may replace accessories and Level I parts; Level II shops may replace non-soldered parts; Level III shops may perform some board level repairs. The U.S. National Service Center makes all repairs.

1.2.4 Customer Support:

Consumers should call 1 - 800 331 - 6456. Motorola Warranty Authorized Service Centers should call 1 - 877 777 - 7520 55# for access to Technical Support.

1.2.5 Replacement Parts Ordering

Only shops authorized to carry out repairs will be able to purchase spare parts. Orders for spare parts should be placed with the Accessories and Aftermarket Division (AAD) of Motorola. Refer to the latest version of CSB 260 for details.

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:
V3682
DESCRIPTION

2.1 Specifications of V3682

General

Function	**Specification**
Frequency Range GSM PCS	1850.2 - 1909.8 MHz Tx 1930.2 - 1989.8 MHz Rx
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	+3.0V dc to +5.1V dc (battery) +4.4V dc to +6.5V dc (external connector)
Transmit Current	Typically 225 ma avg, 1.1A peak
Stand-by Current	Typically 7.5 ma (DRX2)
Dimensions	82mm(L) X 43mm(W) X 26mm(H)
Size (Volume)	72 cc
Weight	83 g
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
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 V3682 Overview

The V3682 has been marketed as the lightest and smallest dual band mobile phone in the world. It is now designed with the new Whitecap Chipset to allow the unit to operate at a lower working voltage and therefore prolong battery life, in both Standby and Talk time.
The holographic display is now fitted into the flip to allow more room on the keypad.

This product is a replacement for Startac 130 and its main features include: -

- Smaller and more stylish form
- Single Band 1900 MHz GSM
- Longer Talk time / Standby time
- Large bit mapped 96 X 54 display with 1 line of Icons and Optimax holographic display
- Class II Sim tool kit
- Internal headset
- Potential to support Half Rate and Enhanced Full Rate modes of transmission (dependant on Network)
- Asian SMS
- Asian Phonebook.
- Extended GSM

The units will be made of a Polycarbonate plastic with the display and speaker fitted within the flip. The bottom part of the clam will contain the keypad the LOGIC / RF PCB, the Mic, earpiece flex connection, external accessory connector and volume buttons. There will be two types of battery doors available each to fit the standard and long life batteries, the phone accepts a 3V or 5V mini SIM card which fits into the SIM slot underneath the battery. There will be no connection or fitting for an Auxiliary battery.
The Antenna is usually a fixed stub type antenna.
The Service indicator will as for other Startac products display a Green light whilst in service, a Red light whilst out of service and will flash Amber when roaming.

Fig 2.1 Mechanical pictorial Overview

2.3 Connector Pinout

1- RF Ground
2- RF In/Out
3- RF Ground
4- Battery Feedback
5- Manual Test Line
6- Not connected
7- Not Connected
8- Audio In
9- Audio Out / On-Off
10- Battery Ground
11- RTN
12- CMP
13- TRU
14- External B+
15- Analogue Ground

2.4 Talk Times, Weight and Volume Matrix

Volume (cubic cm)	Weight (grams)	Talk Time (minutes)	Standby time (hours)	Name
TBD	53	-	-	Transceiver Only
69	72	100-130	70-125	Transceiver with 400 mAh LI Slim Batt
69	77	130-160	95-160	Transceiver with 520 mAh LI Slim Batt
80	92	260-330	190-320	Transceiver with 1000mAh Extended capacity battery
TBD	TBD	TBD	TBD	Transceiver with 200mAh high performance battery

SECTION 3: FEATURE LIST

3.1 List of Features Available

Below are the list of Menu functions available at present, all highlighted text are or menu options that may be added in future versions i.e. on the release of Voice Annotation.
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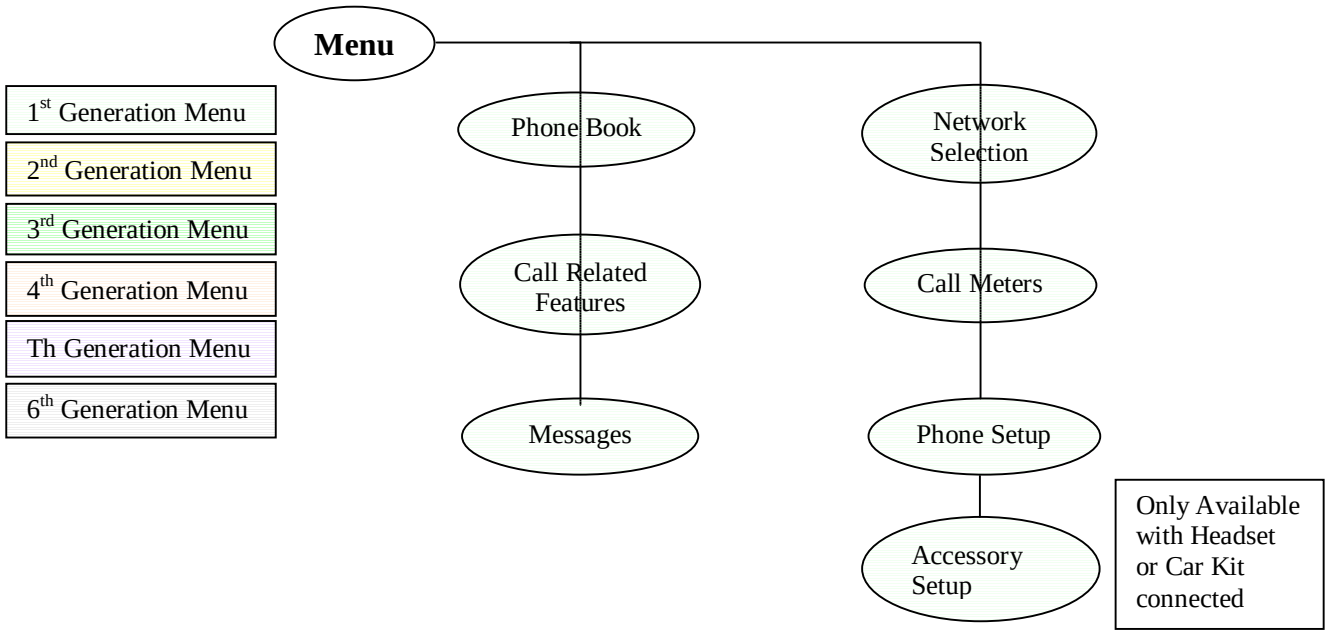
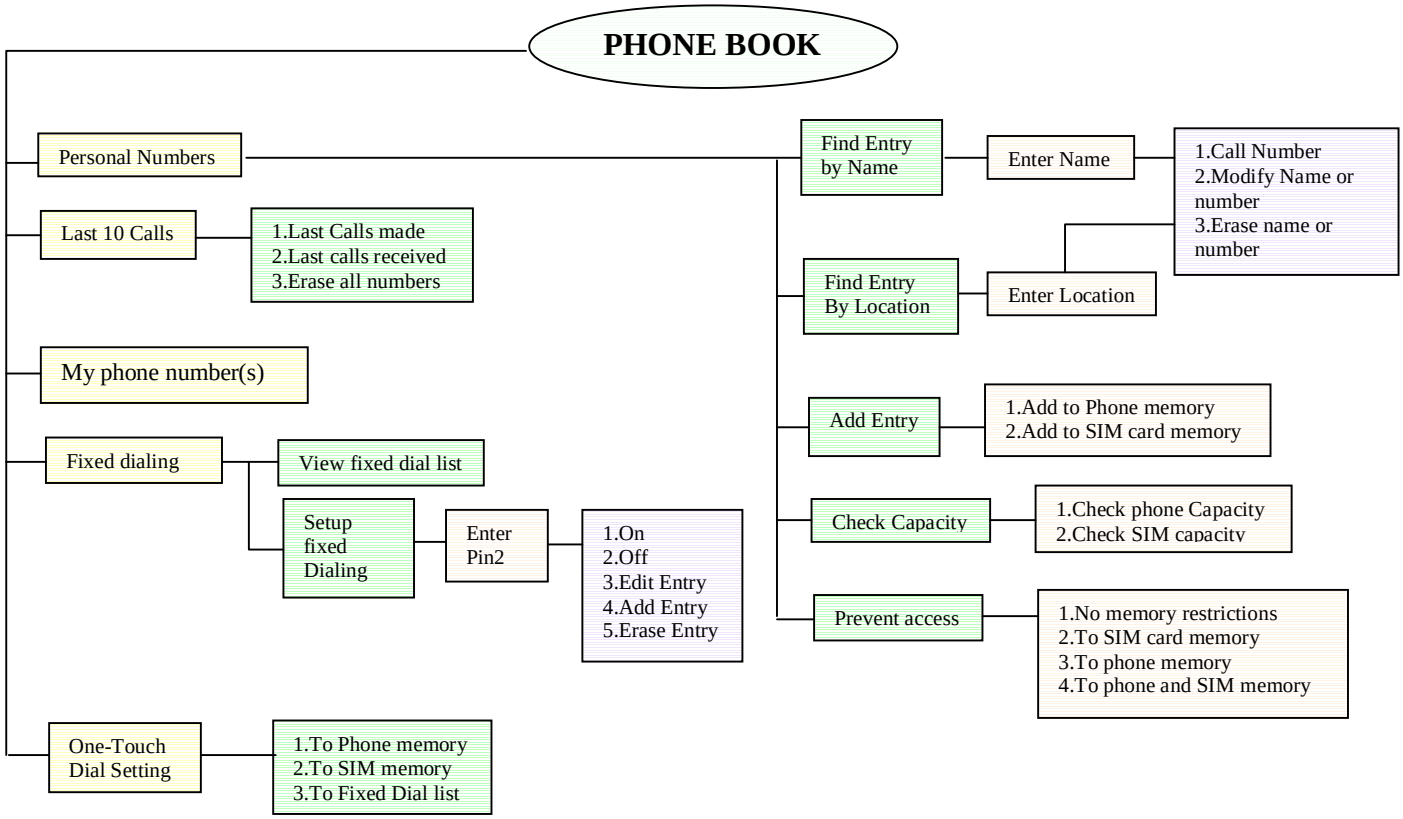
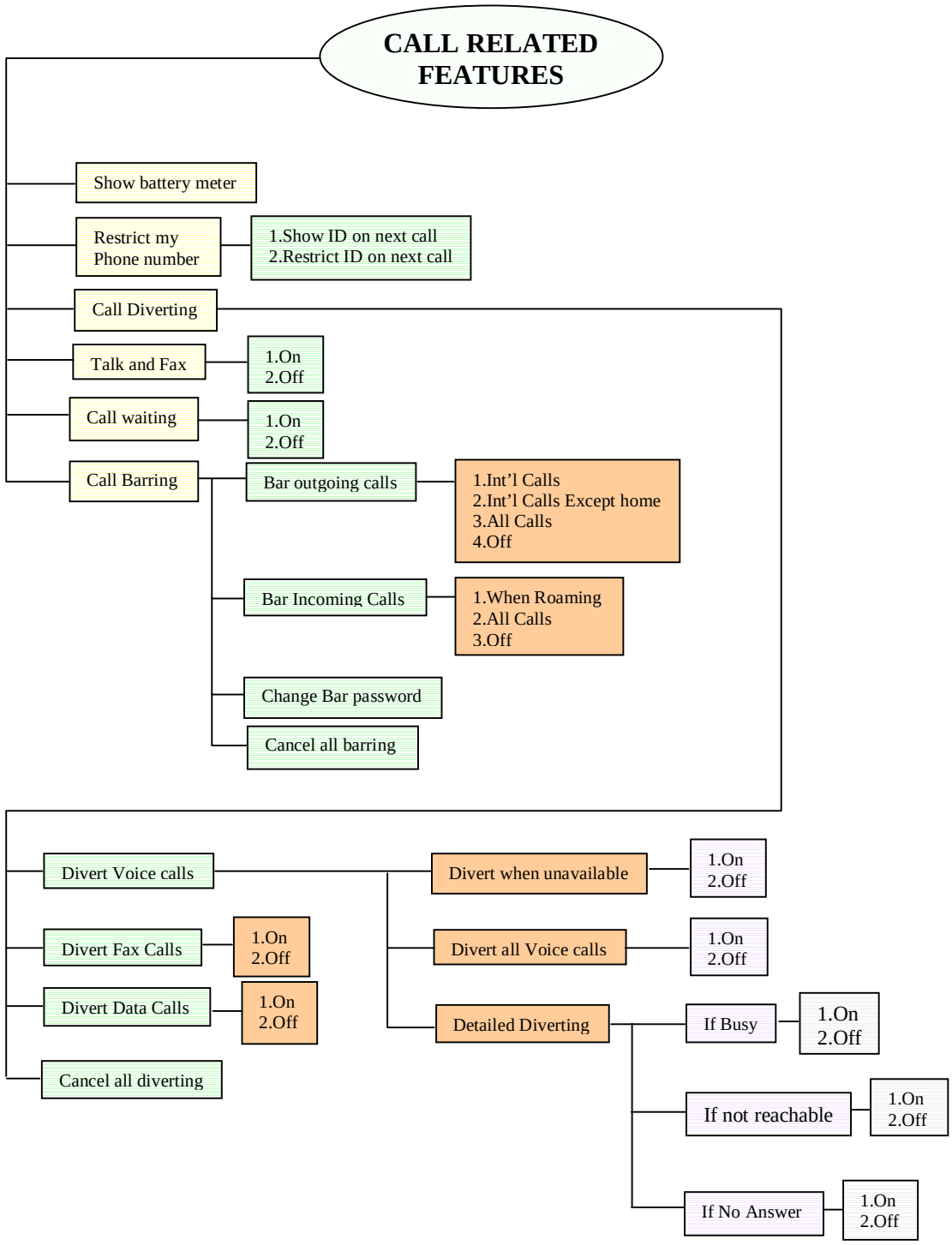
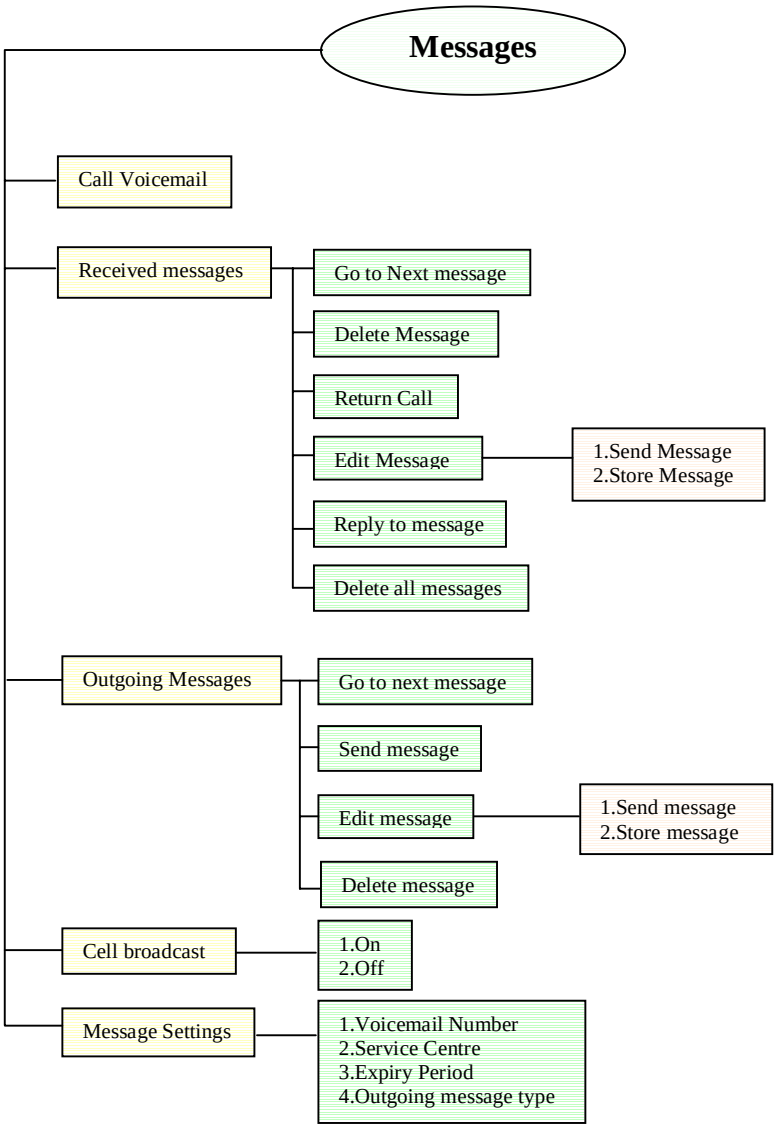
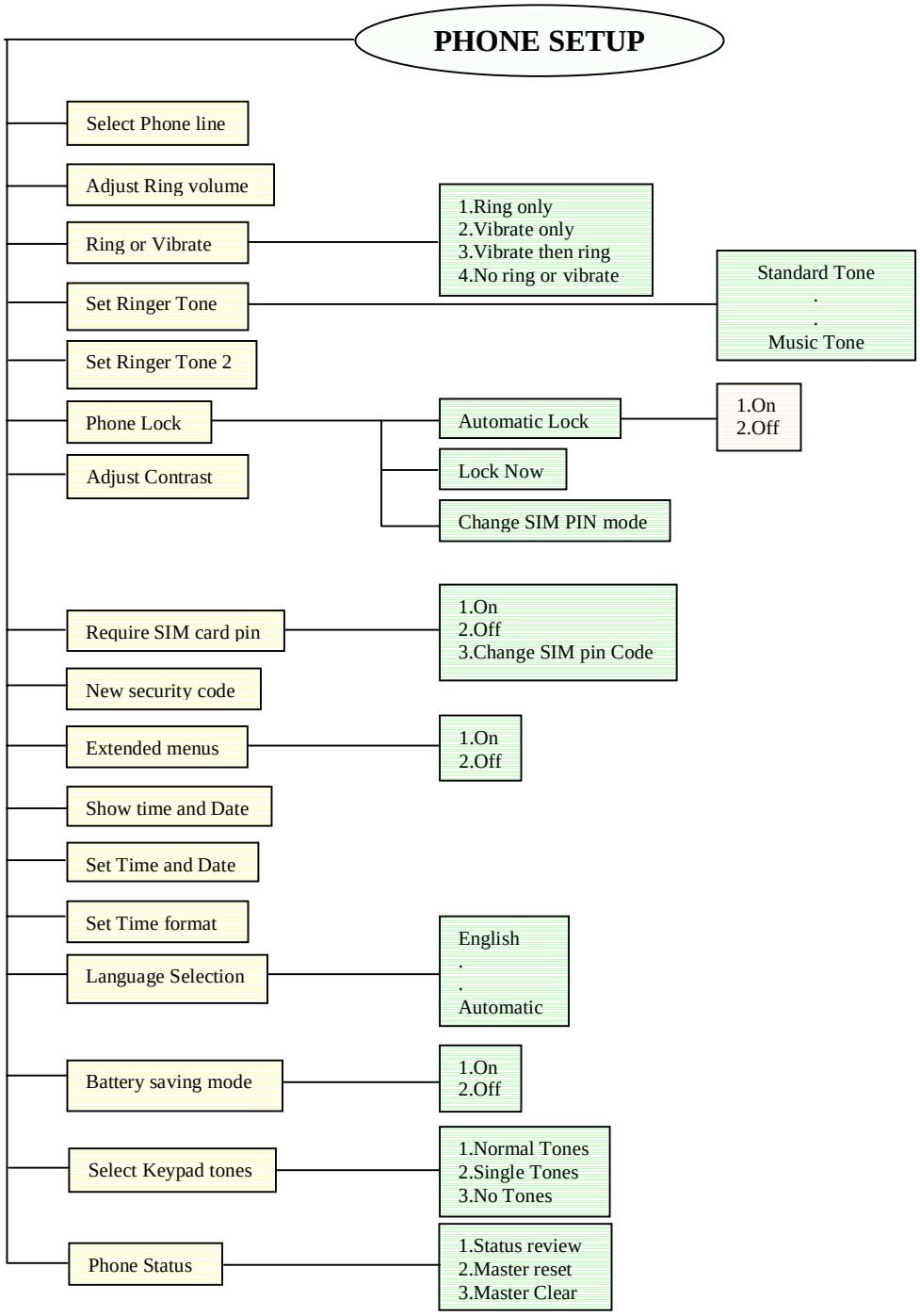
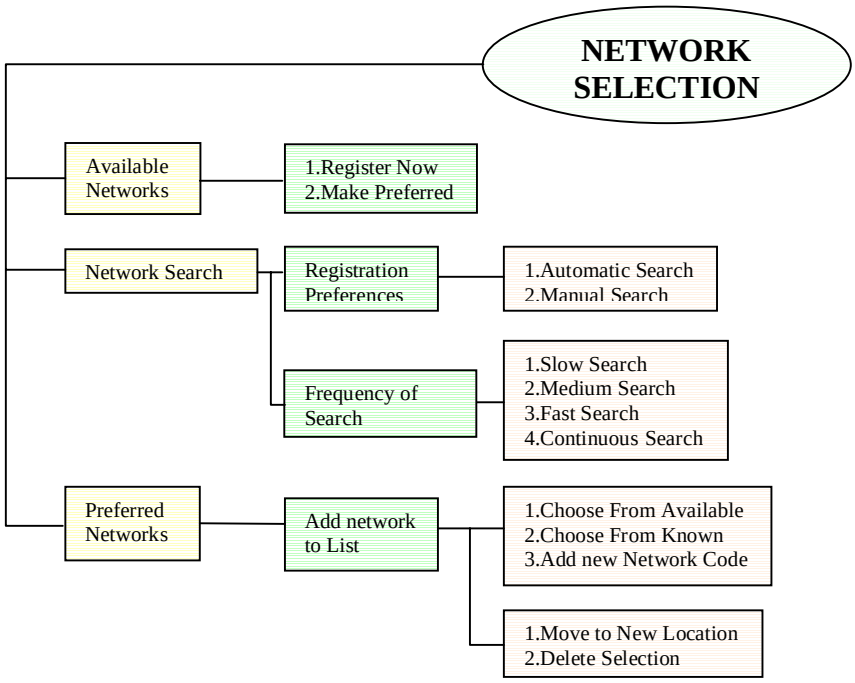


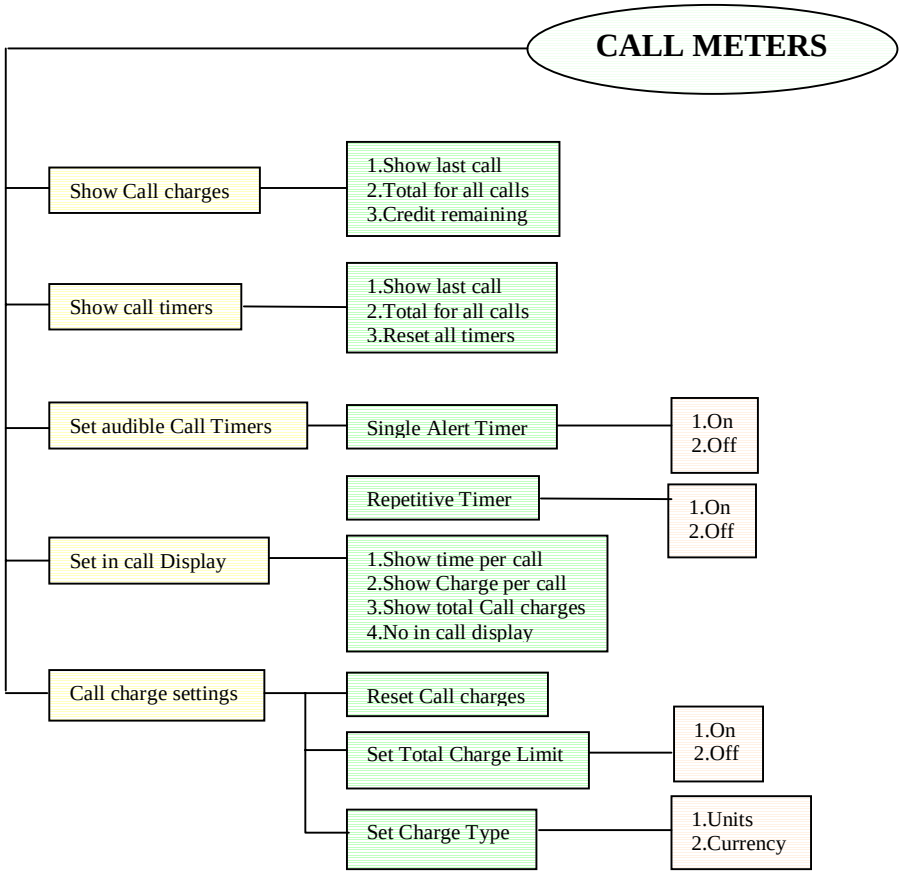


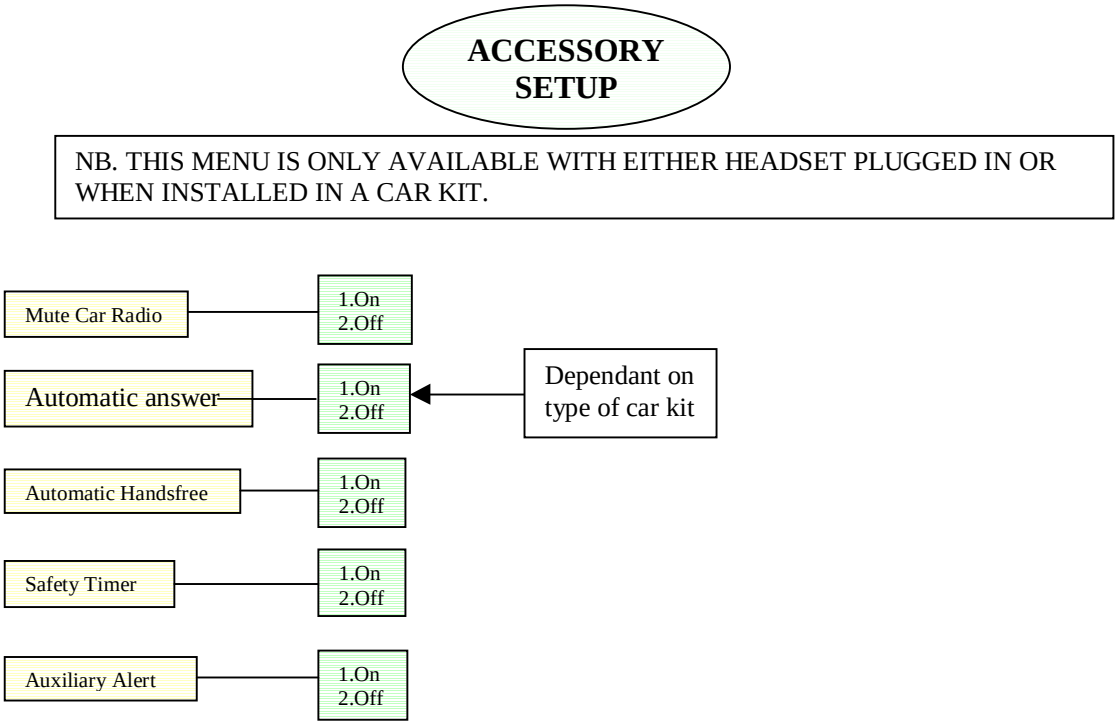

CALL RELATED FEATURES
Show battery meter
Restrict my Phone number
1.Show ID on next call
2.Restrict ID on next call
Call Diverting
Talk and Fax
1.On
2.Off
Call waiting
1.On
2.Off
Call Barring
Bar outgoing calls
1.Int'l Calls
2.Int'l Calls Except home
3.All Calls
4.Off
Bar Incoming Calls
1.When Roaming
2.All Calls
3.Off
Change Bar password
Cancel all barring
Divert Voice calls
Divert when unavailable
1.On
2.Off
Divert Fax Calls
1.On
2.Off
Divert all Voice calls
1.On
2.Off
Divert Data Calls
1.On
2.Off
Detailed Diverting
If Busy
1.On
2.Off
Cancel all diverting
If not reachable
1.On
2.Off
If No Answer
1.On
2.Off


Messages
Call Voicemail
Received messages
Go to Next message
Delete Message
Return Call
Edit Message
1.Send Message
2.Store Message
Reply to message
Delete all messages
Outgoing Messages
Go to next message
Send message
Edit message
1.Send message
2.Store message
Delete message
Cell broadcast
1.On
2.Off
Message Settings
1.Voicemail Number
2.Service Centre
3.Expiry Period
4.Outgoing message type


PHONE SETUP
Select Phone line
Adjust Ring volume
Ring or Vibrate
1.Ring only
2.Vibrate only
3.Vibrate then ring
4.No ring or vibrate
Set Ringer Tone
Standard Tone
.
.
Music Tone
Set Ringer Tone 2
Phone Lock
Automatic Lock
1.On
2.Off
Lock Now
Change SIM PIN mode
Adjust Contrast
Require SIM card pin
1.On
2.Off
3.Change SIM pin Code
New security code
Extended menus
1.On
2.Off
Show time and Date
Set Time and Date
Set Time format
Language Selection
English
.
.
Automatic
Battery saving mode
1.On
2.Off
Select Keypad tones
1.Normal Tones
2.Single Tones
3.No Tones
Phone Status
1.Status review
2.Master reset
3.Master Clear


NETWORK SELECTION
Available Networks
1.Register Now
2.Make Preferred
Network Search
Registration Preferences
1.Automatic Search
2.Manual Search
Frequency of Search
1.Slow Search
2.Medium Search
3.Fast Search
4.Continuous Search
Preferred Networks
Add network to List
1.Choose From Available
2.Choose From Known
3.Add new Network Code
1.Move to New Location
2.Delete Selection


CALL METERS
Show Call charges
1.Show last call
2.Total for all calls
3.Credit remaining
Show call timers
1.Show last call
2.Total for all calls
3.Reset all timers
Set audible Call Timers
Single Alert Timer
1.On
2.Off
Repetitive Timer
1.On
2.Off
Set in call Display
1.Show time per call
2.Show Charge per call
3.Show total Call charges
4.No in call display
Call charge settings
Reset Call charges
Set Total Charge Limit
1.On
2.Off
Set Charge Type
1.Units
2.Currency


ACCESSORY SETUP
NB. THIS MENU IS ONLY AVAILABLE WITH EITHER HEADSET PLUGGED IN OR WHEN INSTALLED IN A CAR KIT.
Mute Car Radio
1.On
2.Off
Automatic answer
1.On
2.Off
Dependant on type of car kit
Automatic Handsfree
1.On
2.Off
Safety Timer
1.On
2.Off
Auxiliary Alert
1.On
2.Off

SECTION 4: DISASSEMBLY & PARTS

4.1 Disassembly Introduction

The V3682 has no screws to hold it together and is held together by plastic catches, these are delicate and should be parted using the upmost care. Also the display flex cable can be torn or broken without too much stress being applied so again caution should be taken on dissassembly or assembly.
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 intergrated 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 V3682.

- Anti-static Mat Kit - 0180386A82, includes:
  Antistatic mat 66-80387A95
  Ground Cord 66-80334B36
  Wrist Band 42-80385A59

- Plastic Bladed Tool SLN7223A

4.3 Disassembly Procedure

The following set of diagrams will demonstrate the correct sequence and action required to disassemble the V3682
The use of the exploded diagram on page **18** 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 up on latch and pulling door.

2.Remove the battery from pushing from the bottom and lifting outwards.

3.Push down on Antenna and screw Antenna Anti-clockwise.

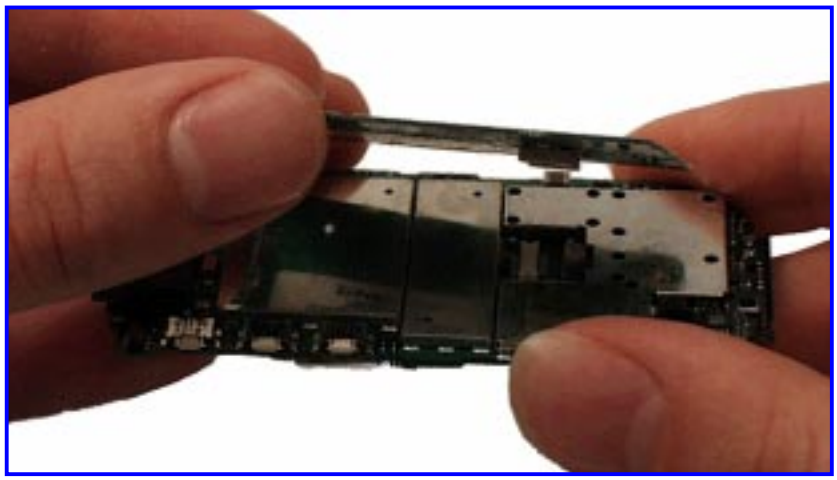
4.Remove the LED Indicator

5.Push tool between latch and housing to prize open

6.Remove with care the backhousing from the front.

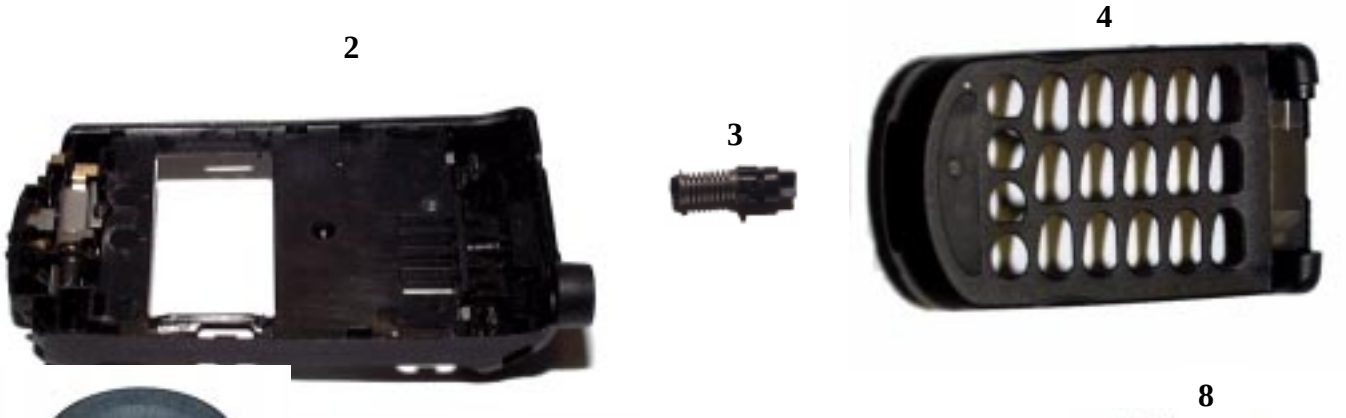
7.Carefully lift the retaining clip on the flex connector. Then pull the flex from the connector.

8.Lift PCB out of front housing



Remove keypad PCB from board

4.5 Exploded Parts Diagram SWF3076DA



4.6 Replacement Parts

Xcvr Item Number		SWF3076DA	
Spare Xcvr Number	1	SE0044AB1Z1	
Rear Hsng	2	0104793Z01	
Hinge Mechanism	3	5504765Z02	
Frnt Hsng Assy	4	0104792Z01	
Flip Assy	5	0185763G01	
Keypad PCB	6	SYN6939A	
Keypad	7	3809378T02	
SW Array Domes	8	4004877Z02	
Escutcheon	9	5403796S01	
Lens	10	6185833G02	
Mic grommet	11	0585699J01	
Mic 6mm	12	5009135L07	
Light Guide	13	6185635H02	
Antenna Insert	14	4385988H01	
Stubby Antenna	15	0185829G02	
Batt Door	16	SYN 7117B	

SECTION 5: SIM CARDS AND SECURITY

5.1 Manual Test Mode

The GSM Motorola V3682 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 test sim (Part No 8102430Z01) must be used. The test sim is inserted into the SIM slot beneath the battery (See **figure 6.1**), the battery should then be re-inserted and the unit powered on. The # button should then be pressed for approximatly 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

5.3.1 Introduction

Personality Transfers are required when a phone is Express Exchanged or when the main board is replaced. The reason for personality transfers are to reproduce the customer's original personalized details such as menu and stored memory such as phone books etc… or even just to program a unit with basic user information such as language selection. There are two possible methods of transferring this information from unit to unit, or with a master transfer, card to unit: -

• **Normal Transfer** is used when the customer's original unit still powers up and as discussed above the customers personalized menu selections etc… are required to be transferred to the replacement unit.

• **Master Transfer** is used when the faulty unit will not power up and the transfer is used to configure the replacement board to a set standard.

Below is the procedure to set up a Master Transfer Card and to carry out each method of transfer correctly.

5.3.2 Normal Transfer

1. Insert transfer card into 'Donor' Unit. Turn unit on till 'Clone' appears.
2. Enter **021#** to upload first block of data. 'Please wait' will be displayed..
3. Remove card.

4. Insert card into replacement unit, or unit with new main RF / Logic PCB.
5. Turn unit on wait till ‘Clone’ appears.
6. Enter **03#** ‘Please wait’ will be displayed while data is transferred.
7. Repeat steps 1 – 6 but enter **022#** at step 2 to transfer data on to Clone card.
8. Repeat steps 1 – 6 but enter **025#** at step 2 to transfer data on to Clone card.

5.3.3 Master SIM Card Creation

1. Insert transfer card into a unit with the desired setup Pwr on and wait till unit displays ‘Clone’
2. Enter **024#** to copy unit ‘personality’ onto card. ‘Please wait’ will be displayed
3. Master Transfer card is created.

5.3.4 Master Transfer

1. Insert Master Transfer Card (explained above) into replacement unit. Pwr on and wait till unit displays ‘Clone’
2. Enter **03#** to download data into replacement unit. Please wait will be displayed.
3. When ‘Clone’ reappears download is completed.

5.3 GSM Test Commands

This is a list of Level 1 and 2 Test commands available to V3682

Table 6.1 Test commands **GSM Test Commands**

Key Sequence	*Test Function/Name*
#(hold down for 2 seconds)	Enter manual test mode
01#	Exit manual test mode
07x#	Mute RX audio path
08#	Unmute RX audio path
09#	Mute TX audio path
10#	Unmute TX audio path
15x#	Generate tone
16#	Mute tone generator
19#	Display S/W version number of Call Processor
20#	Display S/W version number of Modem
36#	Initiate acoustic loopback
37#	Stop test
38#	Activate Mini SIM
39#	Deactivate Mini SIM
43x#	Change audio path
47x#	Set audio volume
51#	Enable sidetone
52#	Disable sidetone
54#	Show Service Indicator LED 0 - Off / 1 – Red / 2 – Green / 3 – Amber (Flip must be Closed)
57#	Initialize non-volatile memory
58#	Display security code
58xxxxxx#	Modify security code
59#	Display lock code
59xxx#	Modify lock code
60#	Display IMEI
980# / 981#	DCS / GSM mode
99#	Display all display pixels

15XX#

90	Vib
91	Ringer

36XX#

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

5.5 Identity and Security

Each Motorola GSM Cellular Cassette 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.

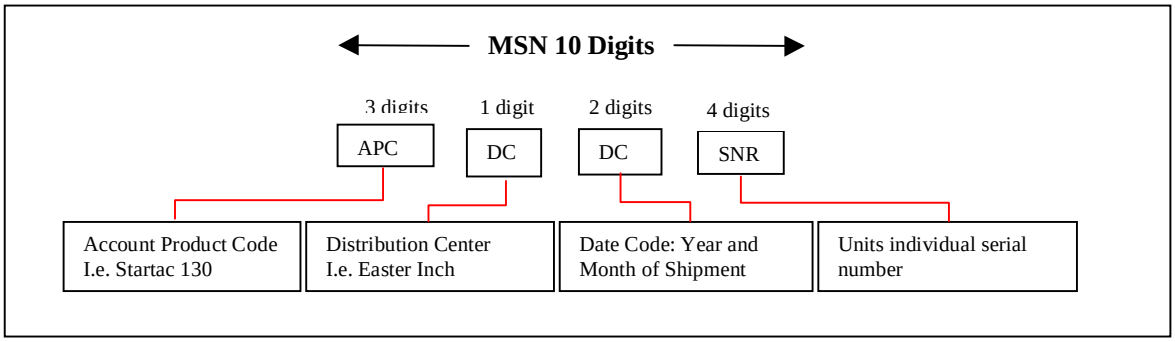


Figure 5.2 MSN label breakdown

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.

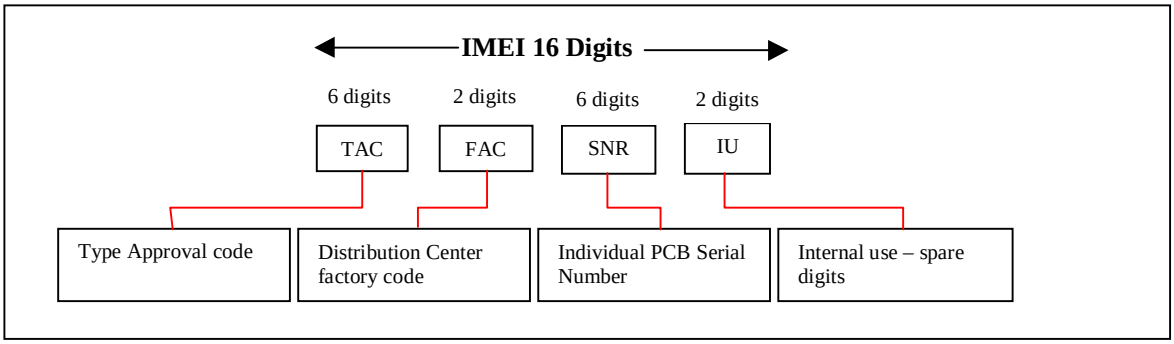


Figure 5.3 IMEI label breakdown

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

XCVR NUMBER: Identifies type of product. i.e. V3682 (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 V3682 is divided into 4 main sections when it comes to part replacability: The flip which contains the display module and speaker, the mechanical parts, the keypad PCB and the main RF / Logic PCB. If the RF / Logic board is required to be changed then a full service tranceiver 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 V3682 is limited to isolation and replacement of the main mechanical parts only (See Exploded parts diagram and associated parts list) **NB. For the immediate future, the front housing and flip assemblies will be ordered as 2 separate parts but cannot be disassembled once together.**

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

Repair Chart

Table 2. GSM V3682 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	Measure battery voltage across a 50 ohm (>1 Watt) load. If the battery voltage is <3.25 V dc, recharge the battery using the appropriate battery charger. If the battery will not recharge, replace the battery. If battery is not at fault, proceed to b.
	b) Battery connectors open or misaligned.	Visually inspect the battery connectors on both the battery assembly and the portable telephone. Re-align and, if necessary, replace either the Battery or the battery connector assembly. Removing the battery connector assembly has to be done with extreme care to avoid damaging the PCB. 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. Verify that the fault has been cleared. If the fault has not been cleared then proceed to d.
	d) Keypad circuit board Failure.	Replace the Keypad board. Temporarily connect a +3.6 V dc supply to the battery connectors Depress the **PWR** button; if unit turns on and stays on, disconnect the dc power source and reassemble the telephone with the new Keypad board. If the fault is not cleared then proceed to e.
	e) Display circuit failure	Disassemble unit and insert Main RF / Logic PCB into new front Hsng with Flip. Inset 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 pin is properly connected to the Logic/ RF assembly. 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 board faulty.	Remove rear housing from unit, check general condition of flex connector if OK check that the Zif connector is fully pressed down and that the flex collars are flush with the plastic of the connector.If not check Zif to PCB connections, if faulty connector, replace RF / Logic PCB. If Ok proceed to b.
	b) Display board is Defective.	Substitute the good RF / Logic PCB into a known good front Hsng /Flip (with good Display circuit board),if the fault is cleared rebuild with new Hsng / Flip assy. If the fault is not cleared, re-install into the original front Hsng / Flip Assy and 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 / 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 improvement in portable transmit signal as heard by called party. If good, re-assemble portable 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)	a) Connections to/from Logic/RF Circuit board defective.	Gain access to Logic/RF board as described in the DISASSEMBLY instructions in this manual. Check connection and the flexistrip from the earpiece to the Logic/RF circuit board. If flex is at fault then replace front / flip Assy. If Zif connector is at fault proceed to d. If connection is not at fault, Proceed to b.
	b) Earpiece Speaker defective.	Remove RF / Logic PCB from housing and insert into known good housing with flip, ensure good flex connection. Place a call and verify improvement in earpiece audio. If better, reassemble the phone with the good Hsng. If it was no better then re-install into the original housings and 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 two 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 assembly 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 portable telephone. 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.
	b) 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.
8. Phone does not sense when flip is Opened or closed (usually indicated by inability to answer incoming calls by opening the flip, or inability to make outgoing calls).	a) Magnet in flip defective	Replace Front / flip assembly with known good one refer to the DISASSEMBLY instructions in this manual. Place call to portable phone and verify ability to answer by opening flip. If faulty rebuild phone with new front / flip Assy. If fault is still present, replace original flip assembly and proceed to b.

SYMPTOM	PROBABLE CAUSE	VERIFICATION AND REMEDY
	b) Reed Switch defective	Gain access to Keypad board as described in the DISASSEMBLY instructions in this manual. Unsolder the reed switch and replace with a known good one. Reassemble unit. Place call to portable phone and verify ability to answer by opening flip. If fault still present, replace original reed switch and proceed to c.
	c) Keypad board is Defective.	Replace the Keypad board with a known good one. Place call to portable phone and verify that the fault has been eliminated. If not at fault, proceed to d.
	d) Logic/RF Board Assembly Defective.	Replace Logic/RF Board Assembly (refer to symptom 1c). Verify that the Fault has been cleared and re-assembles the unit with the new PCB.
9. Vibrator feature not functioning	a) Vibrator defective	Replace vibrator. If fault still present, replace original vibrator motor and proceed to b.
	b) Logic/RF Board Assembly Defective.	Replace Logic/RF Board Assembly (refer to symptom 1c). Verify that the Fault has been cleared and re-assembles the unit with the new PCB.
10. Internal Charger not working	a) Faulty charger circuit on main Board.	Test a selection of batteries in the rear pocket of the desktop charger. Check LED display for the charging indications. If these are charging ok, then the internal charger is at fault. Replace Logic/RF Board Assembly (refer to symptom 1c). Verify that the Fault has been cleared and re-assembles the unit with the new PCB.
11. Real Time Clock resetting when standard battery is removed.	Lithium button cell in the Flip may be depleted.	Remove RF / Logic PCB from housing and insert into known good housing with flip, ensure good flex connection. Check RTC time does not reset If Ok, rebuild with good housing. If fault is still present then replace front / flip Assy.
12. No / Weak audio when using headset	a) Headset not fully pushed home	Fully ensure the 'click' is felt on the jack socket.
	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.

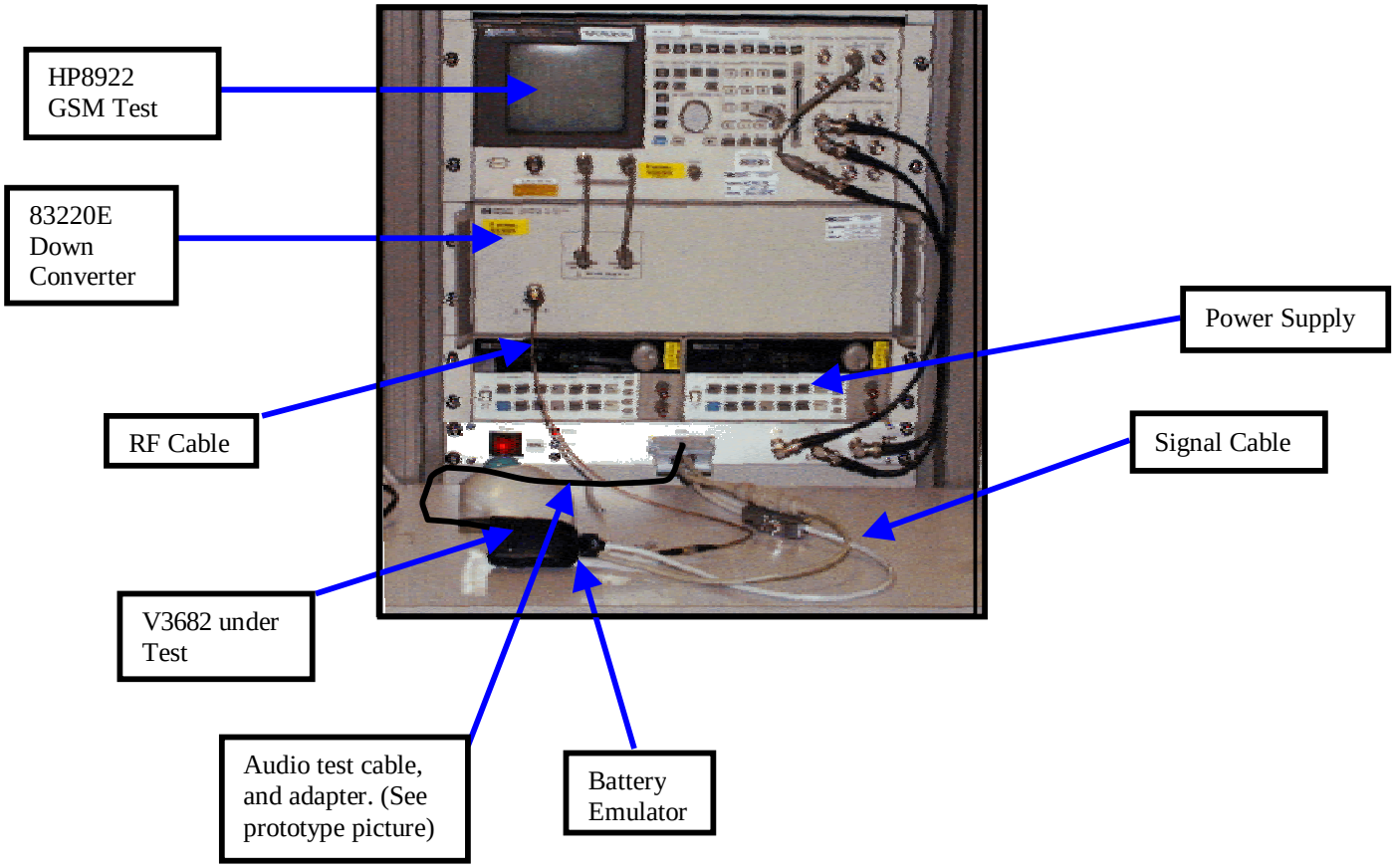
6.4 Software Upgrade

For information on setting up and equipment required for the flashing of software, contact Technical Support at 1-877 777 - 7520 55#.

6.5 Flexing

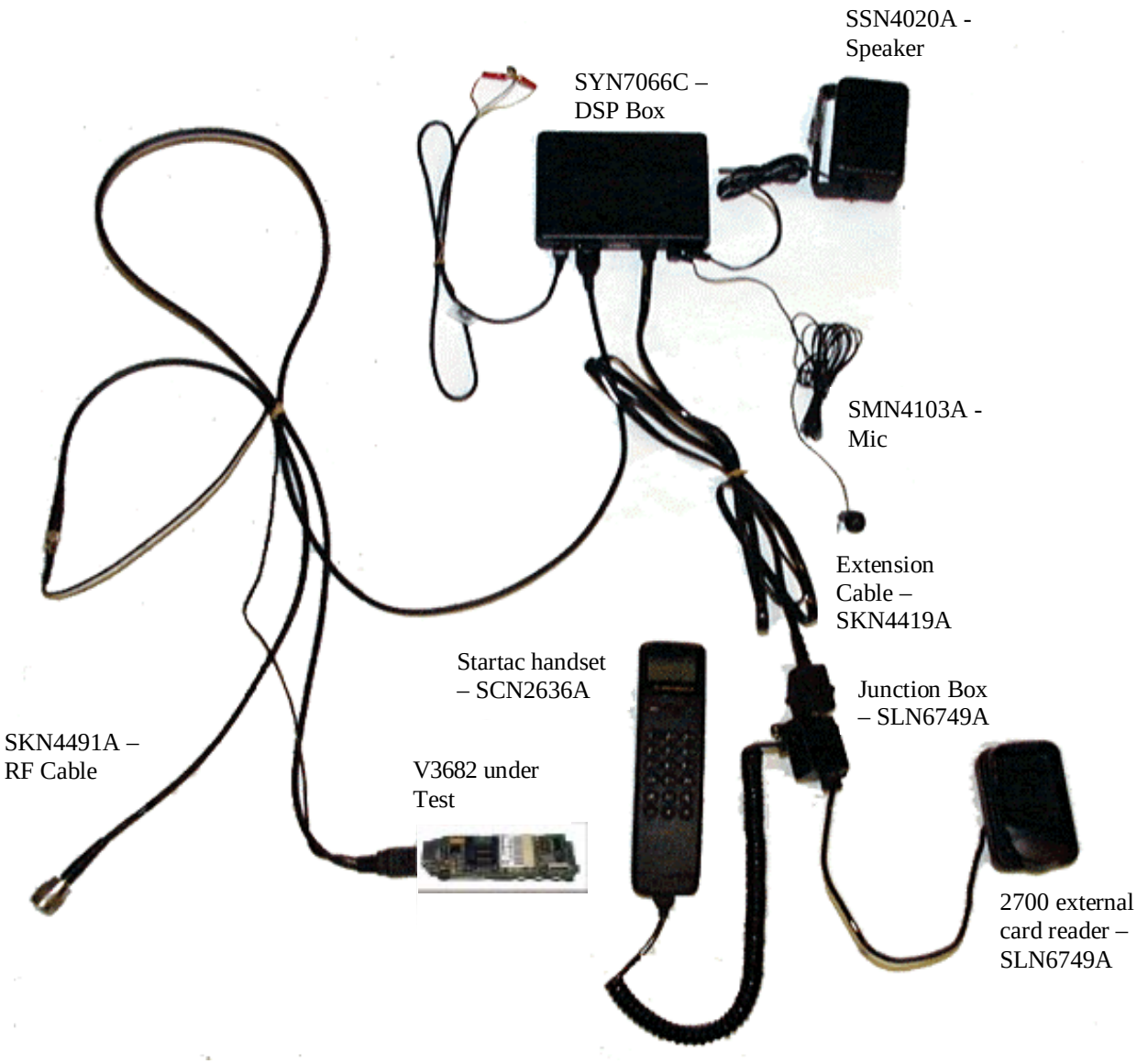
For information on setting up and equipment for flexing, contact should be made with the local technical support engineer.

6.6 Testing on HP8922



NB At the time of release a final version for the Audio cable was unavailable; a photo and part number will be available as soon as the final release is available.

6.7 Testing on Car Kit Set Up



6.8 Testing on Go / NoGo tester

The set up for the GO / NOGO tester must be set up as per above. The tester must be set up as per GSM specifications.
The test incorporates the basic live call, during which many of the RF parameters are checked. This test can be ran in 'Autotest' mode, where the radio is classified at the end of the test as a Pass or Fail. This can be used to indicate whether or not a unit is performing to spec through the Butt Plug only.

SECTION 7: ACCESSORIES

7.1 Introduction

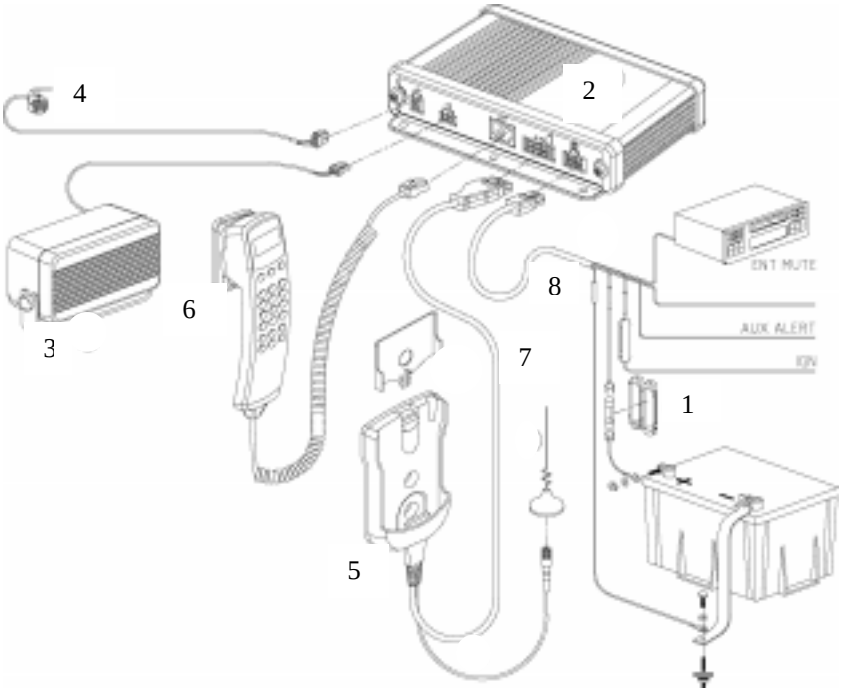
Although the Battery packages are completely different to those used in the other Startac ranges, the accessory socket remains standard so a great deal of the Startac type accessories are still compatible. There is no requirement for any Auxiliary battery.

Accessories available and compatibility matrix

Accessory	Blister	Generic	V3682	StarTAC 130	Cd930
Battery LiIon 500	BLS9050	SNN5435	*		
Battery LiIo 1000	BLX9100	SNN5451	*		
Battery NiMH 500	BNX9050	SNN5341	*		
Battery LiPoly 800	BPS9060	TBD	*		
Mini Travel Charger Euro	CHA9050	SPN4604/ SYN7456	*	*	*
Mini Travel Charger UK	CHA9060	SPN4604/ SYN7455	*	*	*
Std Desktop Charger	CHA9150	SPN4573	*		
Mini Desktop Charger	CHA9250	SPN4640	*		
HF Desktop Charger	CHA9350	TBD	*		
Ultra Saver CLA	CLA9000	SYN4241	*	*	*
Headset	HSK9000	SYN6962	*	*	*
Cradle	HUC9050	SYN7698	*		
Easy Install Car Kit	HFK9050	S8464A	*	*	*
Pro Install Car Kit	HFK9450	(SYN7695 cradle)	*		
Plastic Holster	CCA9150	SYN7678	*		
Leather Pouch	CCA9050	TBD	*		
Leather Case	CCA9060	TBD	*		

V3682

Voice Recognition Car Kit



Part Numbers for V3682 Voice recognition Car Kit
1.SKN4937A – Fuse Cabling and mount
2.SYN7066C – DSP Box
3.SSN4020A - Speaker
4.SMN4103A - Mic
5.SYN7695A – Mounting Bracket
6.TRN5502A - Bracket
7.SKN4491A – RF Cable
8.SKN4834A – Power Cable

SJN8205A – Install and User manual
SJN8635A – Manual Insert

The V3682 Voice Recognition Car kit is a professional install handsfree car kit with improved full duplex performances for the StarTAC models. The Kit uses the latest Digital Signal Processor (DSP) technology for high quality audio as well as Voice Recognition (VR) algorythms, and includes all basic handsfree components, hang up cup, DSP HF box, speaker, directional microphone, and cables.

Key VR Features:
- Activation word to make and answer calls
- Up to 100 names and phone numbers memory
- Selectable language prompts, up to 7 different languages

Key DSP Features:
- Superb full digital audio quality and clarity even at high driving speeds
- Improved full duplex audio allowing genuine two-way conversation
- Digital noise cancellation filtering out background noise
- Digital echo cancellation eliminating local and network echoes

Standard Features:
- Full hands-free capability for comfort and safety communication while driving
- Direct RF connection to external antenna for better coverage
- Directional microphone
- Intelligent rapid charge
- Entertainment mute
- Auxiliary alert
- Programmable safety timer
- Programmable automatic answer

Packaging Information:
- New retail box, descriptions in 9 languages
- Installation & User manuals, 16 languages

SECTION 8: GLOSSARY OF TERMS

8.1 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

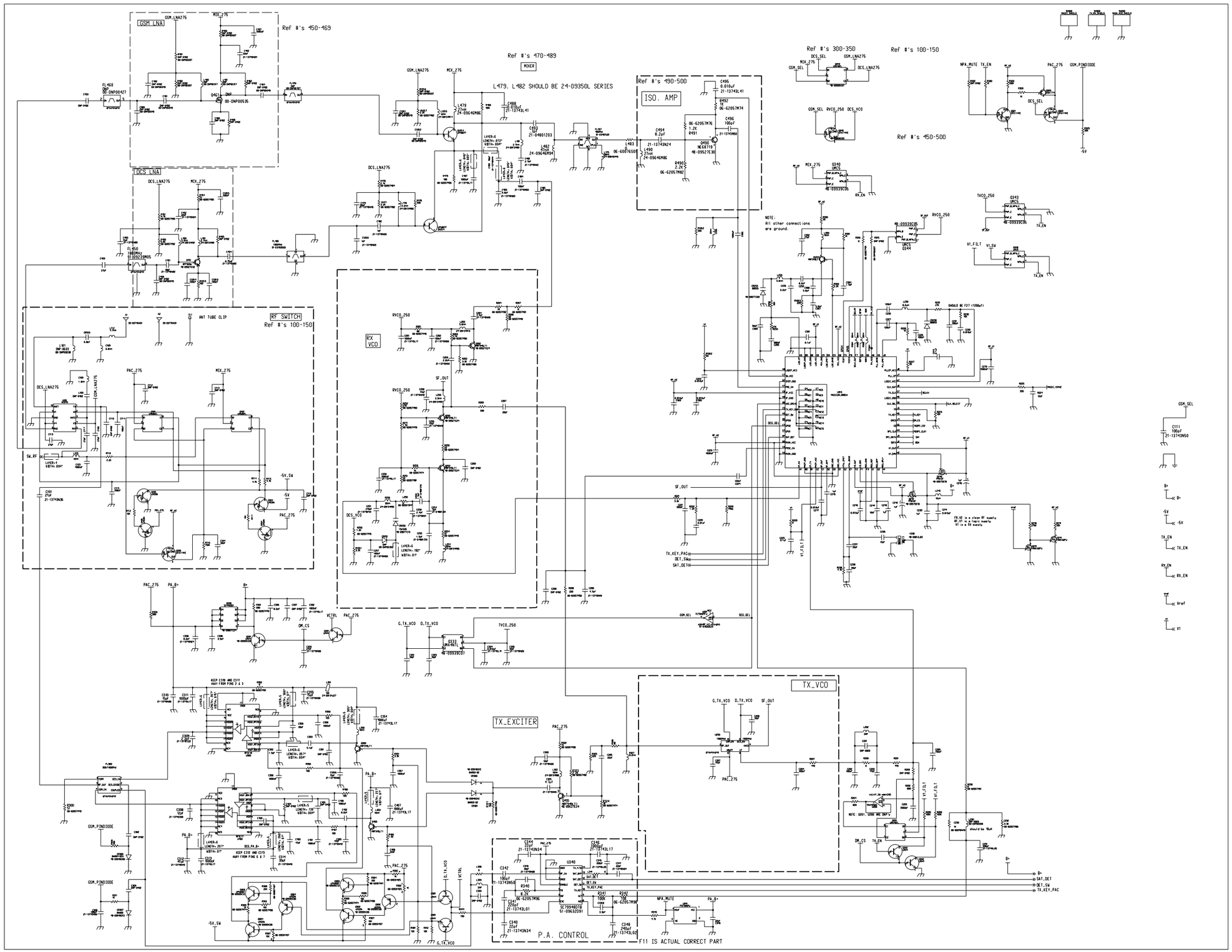
CSPDN	Circuit Switched Public Data Network
CUG	Closed User Group
CW	Call Waiting
DB	Dummy Burst
DBS	Distributed Base Station **
DCCH	Dedicated Control Channel
DET	Detach
DFE	Decision Feedback Equalizer
DISC	Disconnect
DL	Data Link (layer)
Dm	Control Channel (ISDN terminology applied to mobile service)
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
HANDO	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

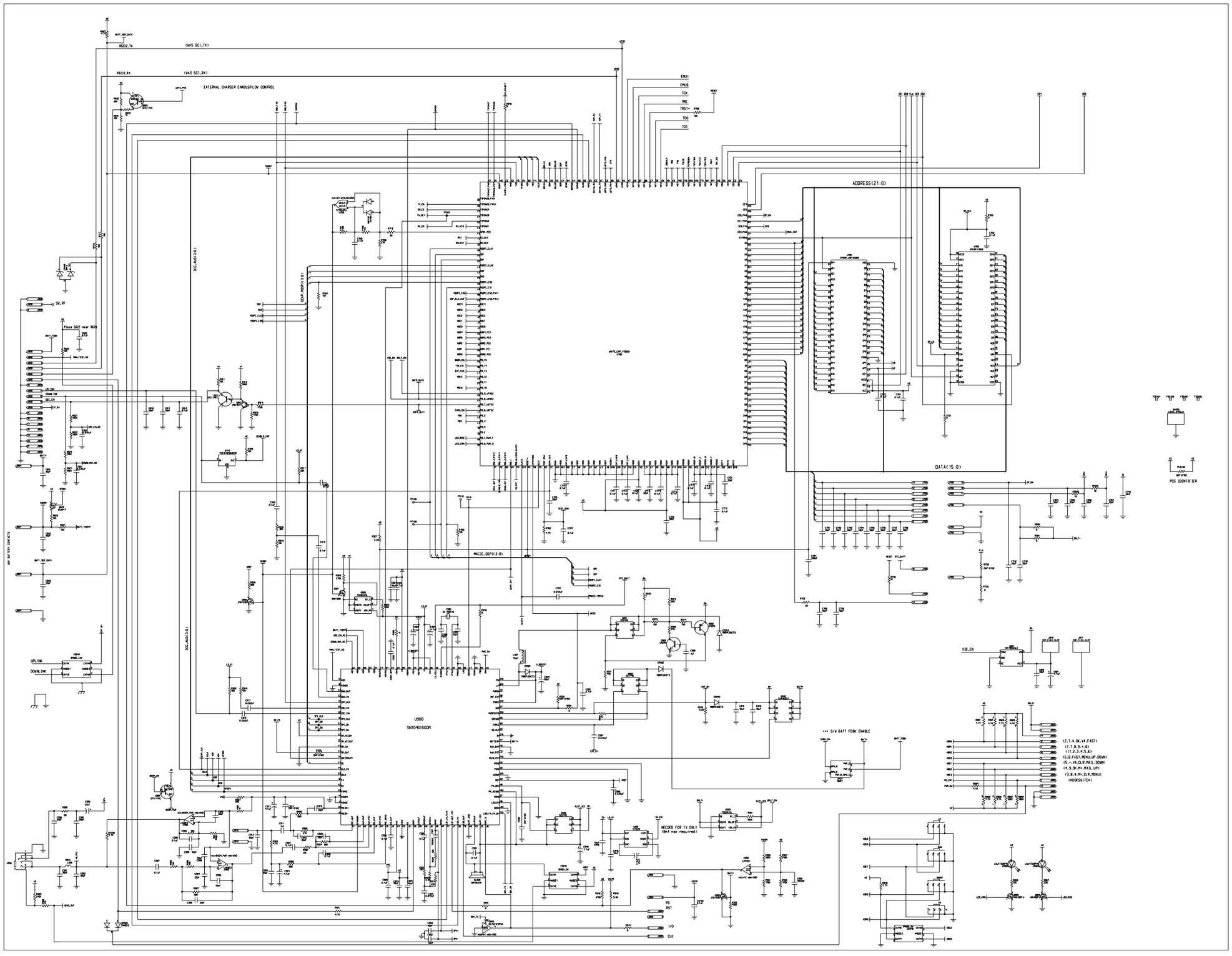
NET	Norme European de Telecommunications
NM	Network Management
NHC	Network Management Center
O&M	Operations and Maintenance
OACSU	Off Air Call Set-Up
OCB	Outgoing Calls Barred
OMAP	Operations and Maintenance Application Part (previously was OAMP)
OMC	Operations and Maintenance Center
OMCR	Operations and Maintenance Center -Radio Part
OMCS	Operations and Maintenance Center -Switch Part
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 **
RBU	Remote Base Station Unit (PCN) **
RCU	Radio Channel Unit **
REC	Recommendation
REL	Release
RELP-LTP	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

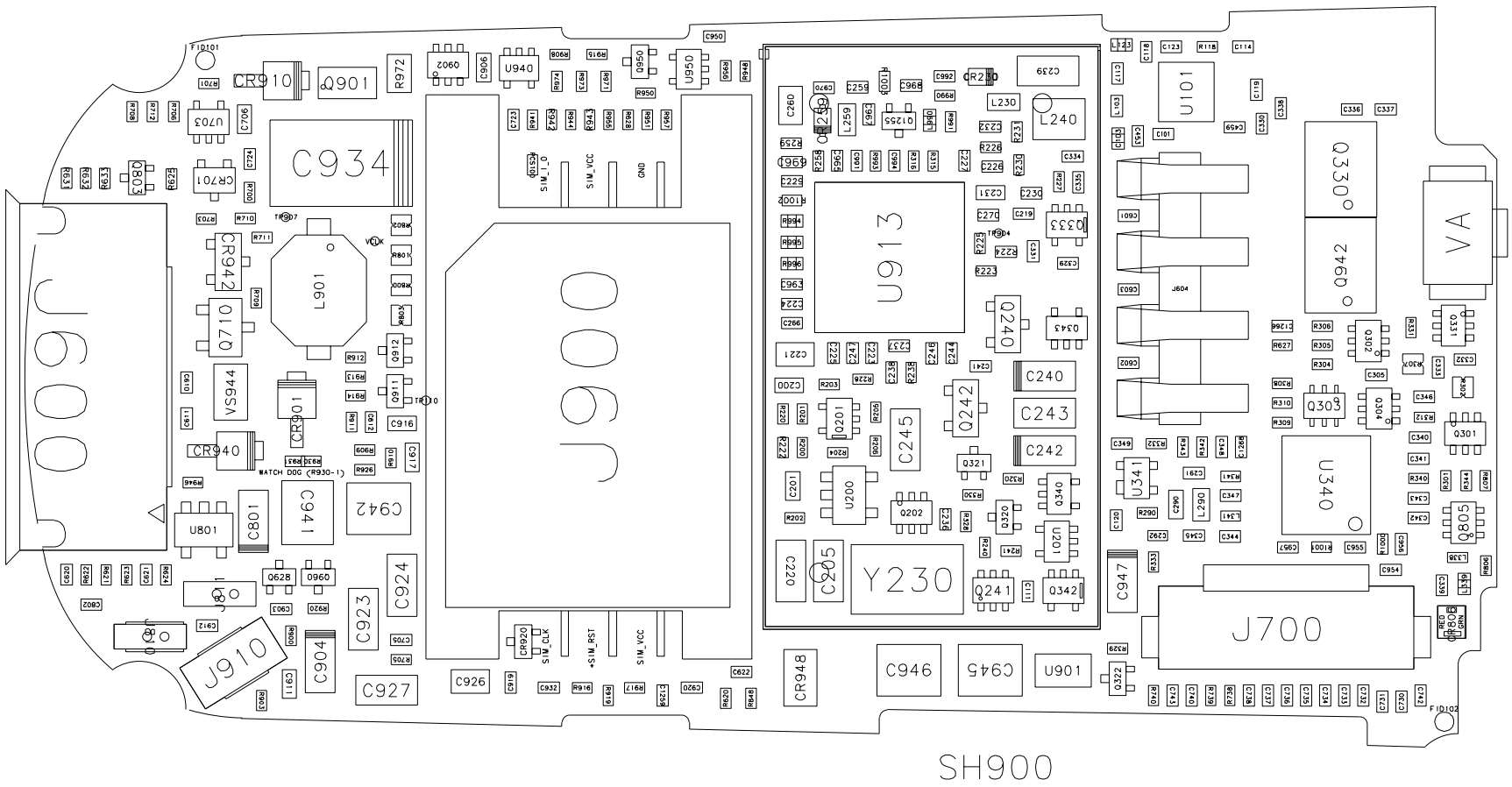
V3682 - RF SCHEMATICS



V3682 - AL SCHEMATICS

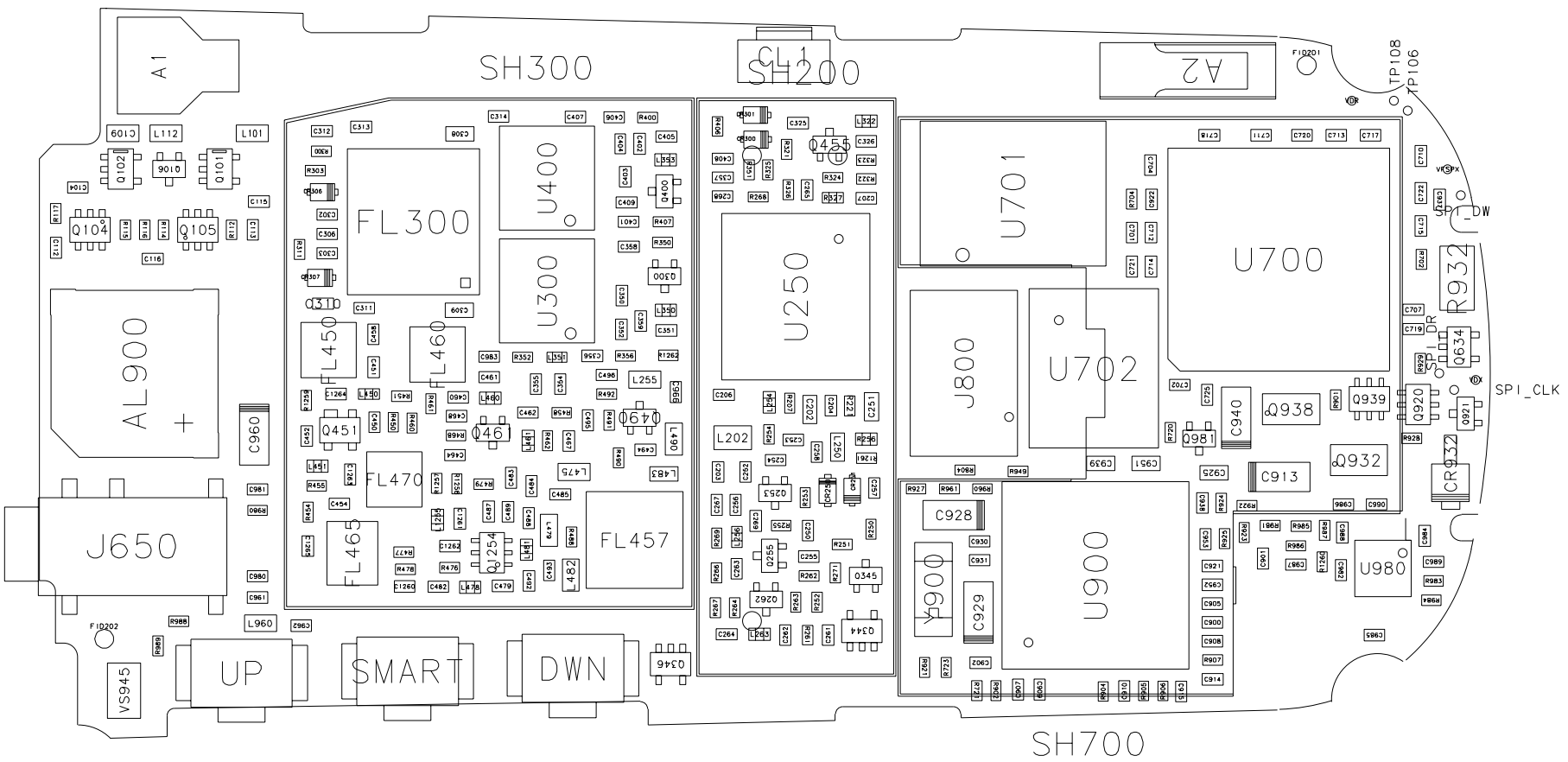


V3682 - BOARD OVERLAY - TOP SIDE



SH900

V3682 - BOARD OVERLAY - BOTTOM SIDE



COMPONENT OVERLAY 2 (BOTTOM)

NOTES