



MOTOROLA

Personal Communications Sector

GSM
Service Support
Level 1&2 Authorized

M3588



GSM Service Support

Training - Documentation - Engineering



Level 1 & 2 Service Manual

Rev 1.0

CONTENTS

	Page Number
<u>SECTION 1: GENERAL</u>	
1.1 Introduction	v
1.2 Motorola service policy for M3588 in warranty	vi
1.3 General Safety Information	vii
<u>SECTION 2: M3588 DESCRIPTION</u>	
2.1 Specifications of M3588	2
2.2 M3588 Overview	3
2.3 Connector Pinout	5
2.4 Talk time, Weight and Volume Matrix	5
<u>SECTION 3: FEATURE LIST</u>	
3.1 List of Features available	7
3.2 Phone Book	7
3.3 Call Related Features	8
3.4 Messages	9
3.5 Phone Set Up	10
3.6 Network selection	11
3.7 Call Meters	11
3.9 Prepay Service	12
<u>SECTION 4: DISASSEMBLY & PARTS</u>	
4.1 Dissassembly Introduction	14
4.2 Recommended Tools	14
4.3 Disassembly Procedure	14
4.4 Assembly procedure	14
4.5 Exploded Parts diagram	18
4.6 Replacement parts	18
<u>SECTION 5: SIM CARDS AND SECURITY</u>	
5.1 Manual test mode	20
5.2 Live Sim Card	20
5.3 Personality Transfer	20
5.4 GSM Test Command	21
5.5 Identity and Security	22

SECTION 6: REPAIR & TEST PROCEDURES

6.1	Repair introduction	24
6.2	Mechanical repairs	24
6.3	Basic modular troubleshooting	24
6.4	Repair Chart	25
6.5	Software Upgrade	27
6.6	Flexing	27
6.7	Testing on HP8922	28

SECTION 7: ACCESSORIES

7.1	Introduction	30
-----	--------------	----

SECTION 8: SALES MODELS

8.1	Dark Blue	32
8.2	Champagne Gold	32

SECTION 9: GLOSSARY OF TERMS

9.1	List of Abbreviations	34
-----	-----------------------	----

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 M3588, 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.

Computer Software Copyrights

The Motorola products described in this instruction manual may include copyrighted Motorola computer programs stored in semi-conductor memories or other media. Laws in the United States and other countries preserve for Motorola certain exclusive rights for copyrighted computer programs, including the exclusive right to copy or reproduce in any form the copyrighted computer program. Accordingly, any copyrighted Motorola computer programs contained in the Motorola products described in this instruction manual may not be copied or reproduced in any manner without the express written permission of Motorola. Furthermore, the purchase of Motorola products shall not be deemed to grant either directly or by implication, estoppel, or otherwise, any license under the copyrights, patents or patent applications of Motorola, except for the normal non-exclusive, royalty free license to use that arises by operation of law in the sale of a product.

1.2 Motorola Service Policy for M3588 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: M3588 DESCRIPTION

2.1 Specifications of M3588

General

Function	Specification
Frequency Range GSM	880-915 MHz TX (with EGSM)
Frequency Range DCS	925-960 MHz RX 1710-1785 MHz Tx 1805-1880 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	+4.0V dc to +6.0V dc (battery) +6.7V dc to +8.6V dc (external connector)
Transmit Current	Typically 250 ma avg, 1.0A peak
Stand-by Current	Typically 7.0 ma (DRX2)
Dimensions	140mm X 50mm X 25mm
Size (Volume)	155 cc
Weight	168 g
Temperature Range	-10C to +55C

Transmitter

Function	Specification
RF Power Output	33 dBm \pm 2dB GSM/ 30 dBm \pm 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 M3588 Overview

The M3588 is marketed as a 'price beater' unit in its class. 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.

It is a band aware dual band product, Uses the Motorola AANN404A battery. (This is different to all the M1/2/6 & 788

There will be two colours: - Champagne and Blue.

Graphics Display – 96 X 54

Branded within the U or Pay as You go Tariff ranges, these two look exactly the same, this product is unique in that the Telemac software supports the pay as you go option whilst roaming. The function operates using a set of protocols and commands through the network base stations between the unit and the network provider and is programmed using SMS.

Different Antenna

Larger phone memory is incorporated to support the Over the phone programming (OTA)

This product is within the same family as the Modulus II and its main features include: -

- Dual Band
- Pay As You Go option
- Class II Sim tool kit
- Internal headset socket
- Potential to support Enhanced Full Rate mode of transmission (dependant on Network)
- Extended GSM
- Phase II USSD i.e. ability to contact service provider functions such as present amount of credit remaining

The M3588 is mechanically very similar to the M3588 (EMEA)

All the circuitry is contained on 1 PCB including the Keypad. The Display is connected to the PCB via a ZIF connector.

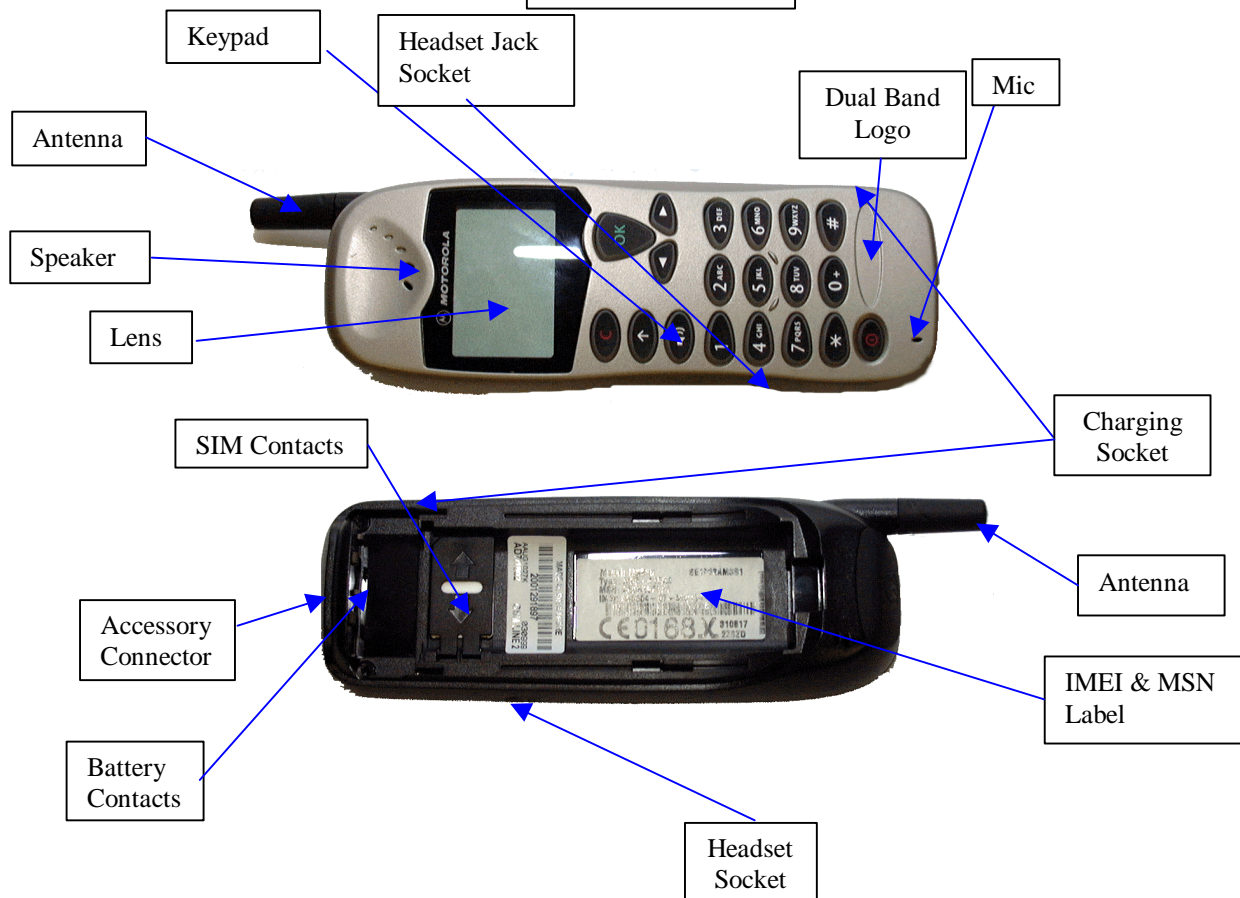
The charger is now placed on the bottom right hand side of the unit

The Antenna is a fixed stub type antenna.

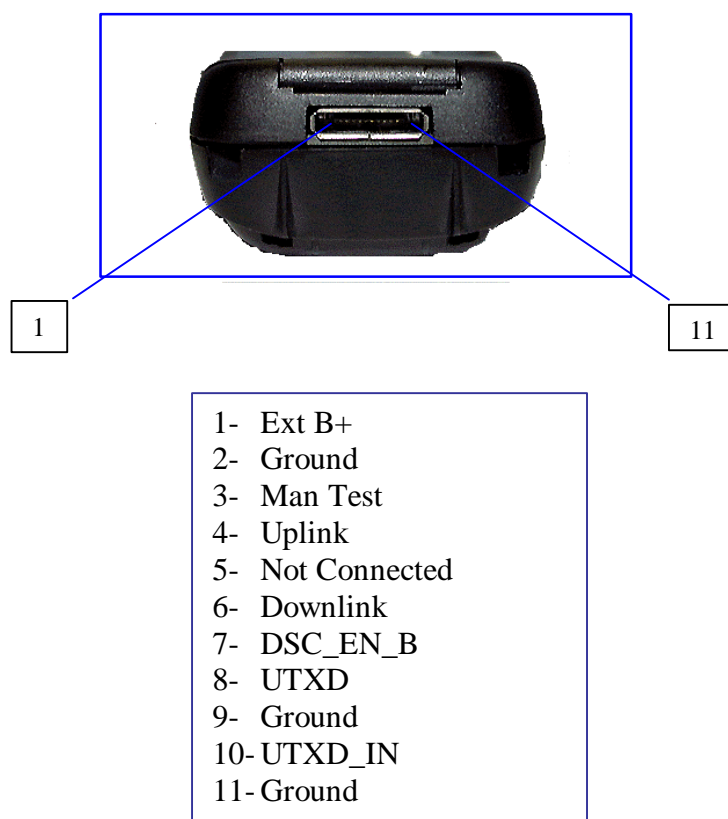
Volume switch on main keypad



**Fig 2.1 Mechanical
pictorial Overview**



2.3 Connector Pinout



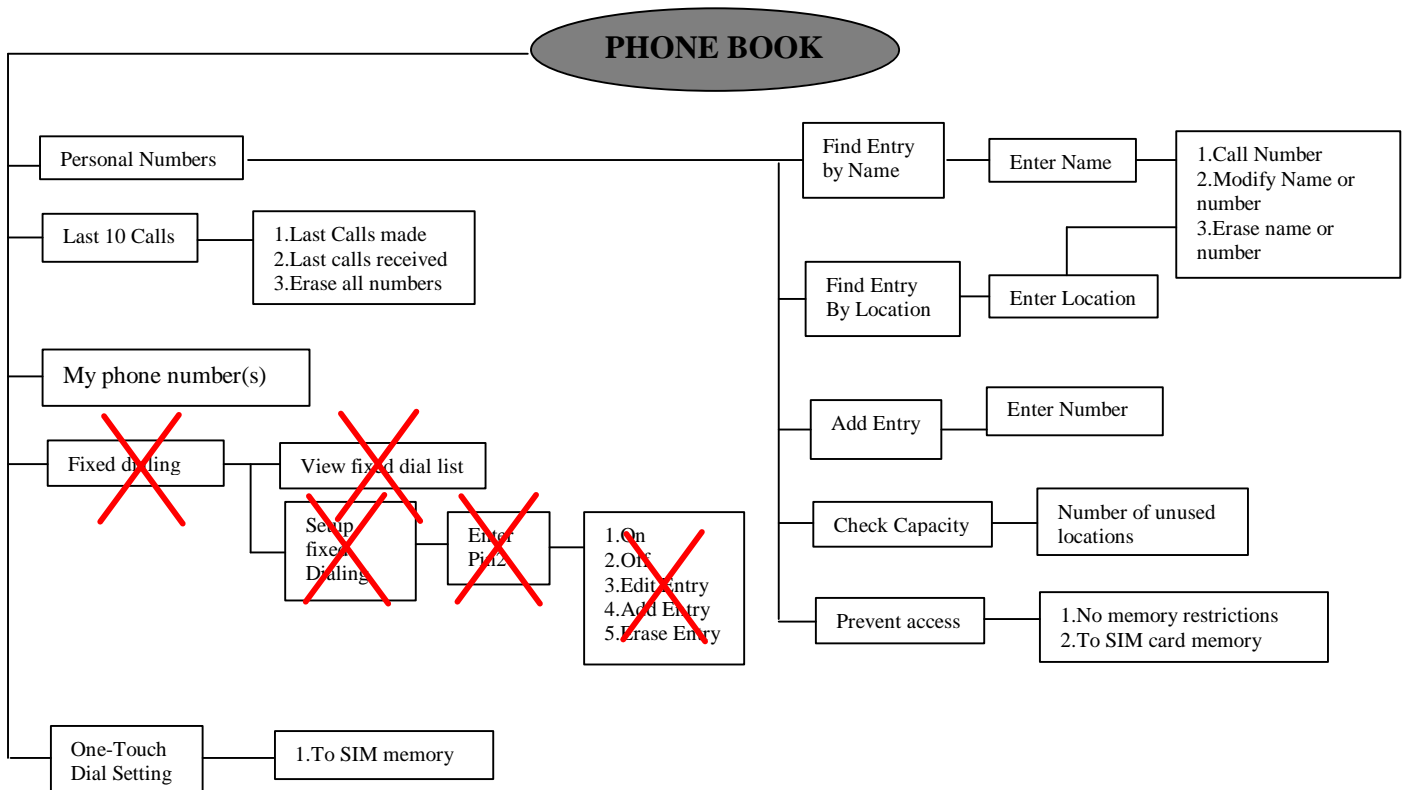
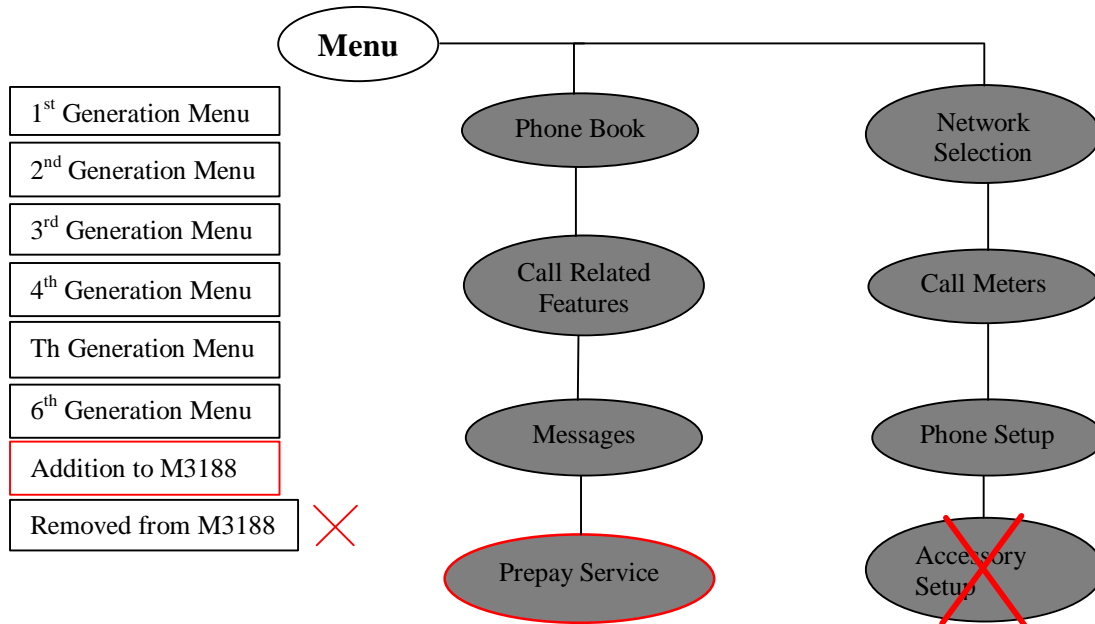
2.4 Talk Times, Weight and Volume Matrix

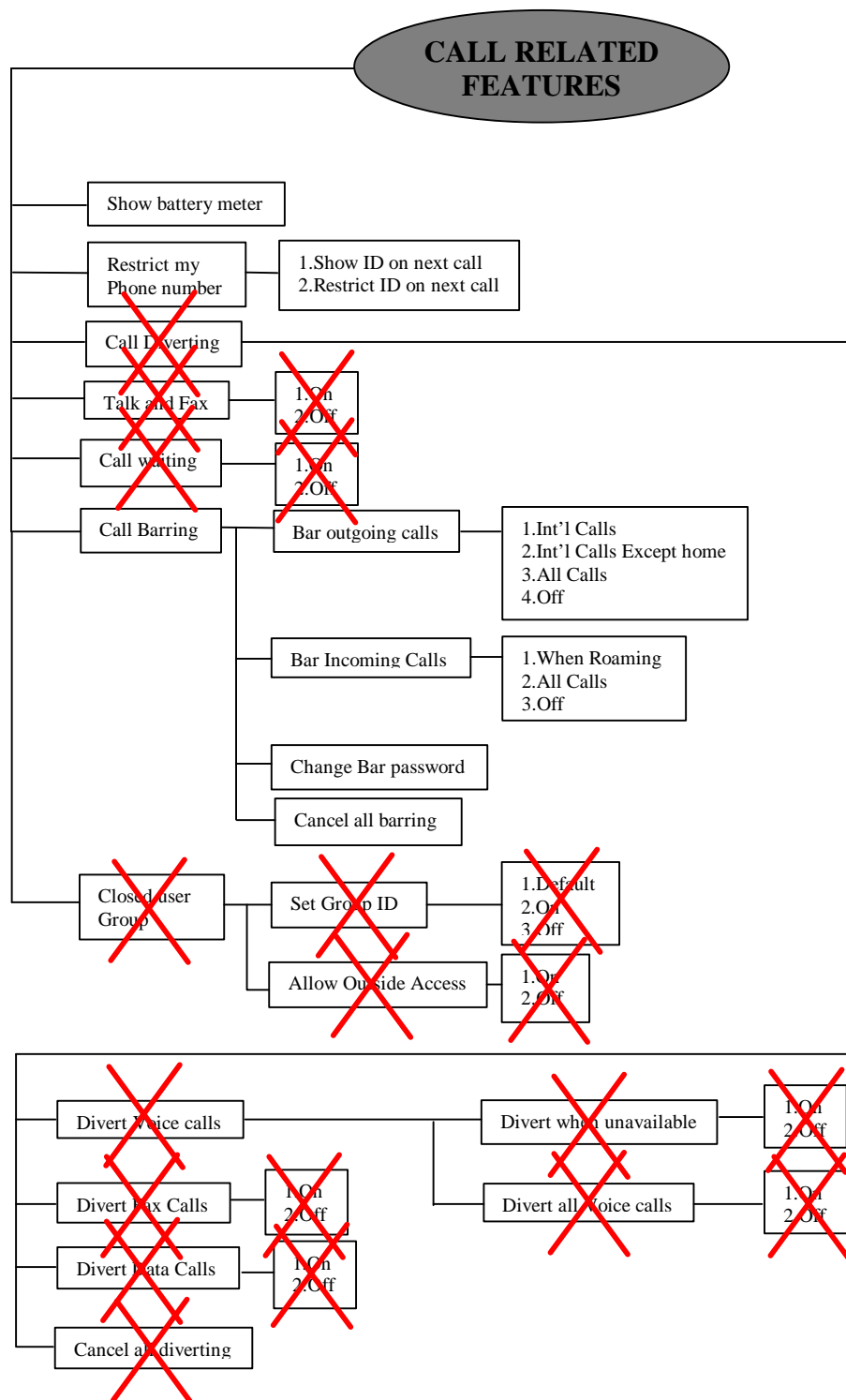
Volume (cubic cm)	Weight (grams)	Talk Time (minutes)	Standby time (hours)	With Battery type:
157	170	160 - 230	74 - 110	650mAh AAA Long NiMH

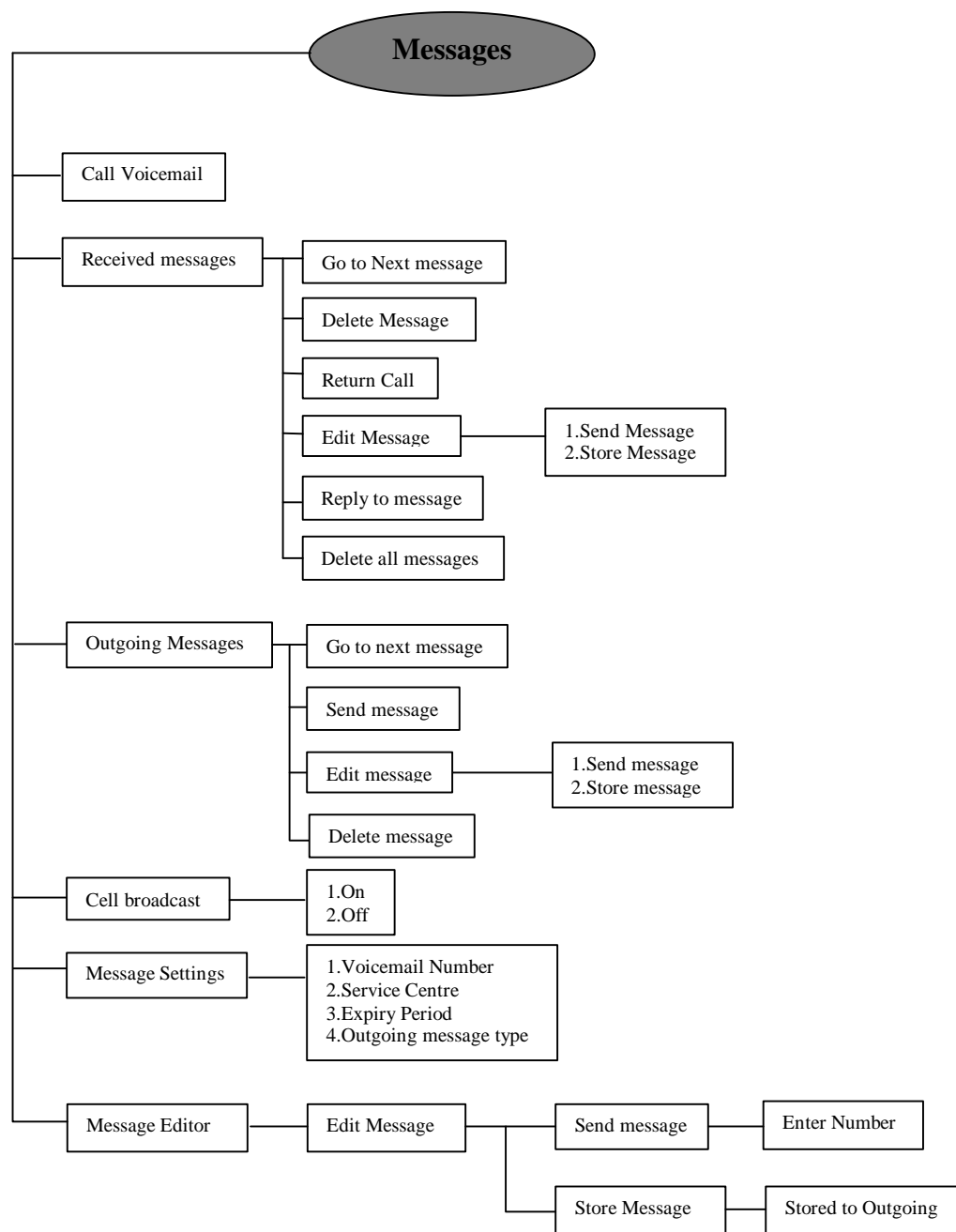
SECTION 3: FEATURE LIST

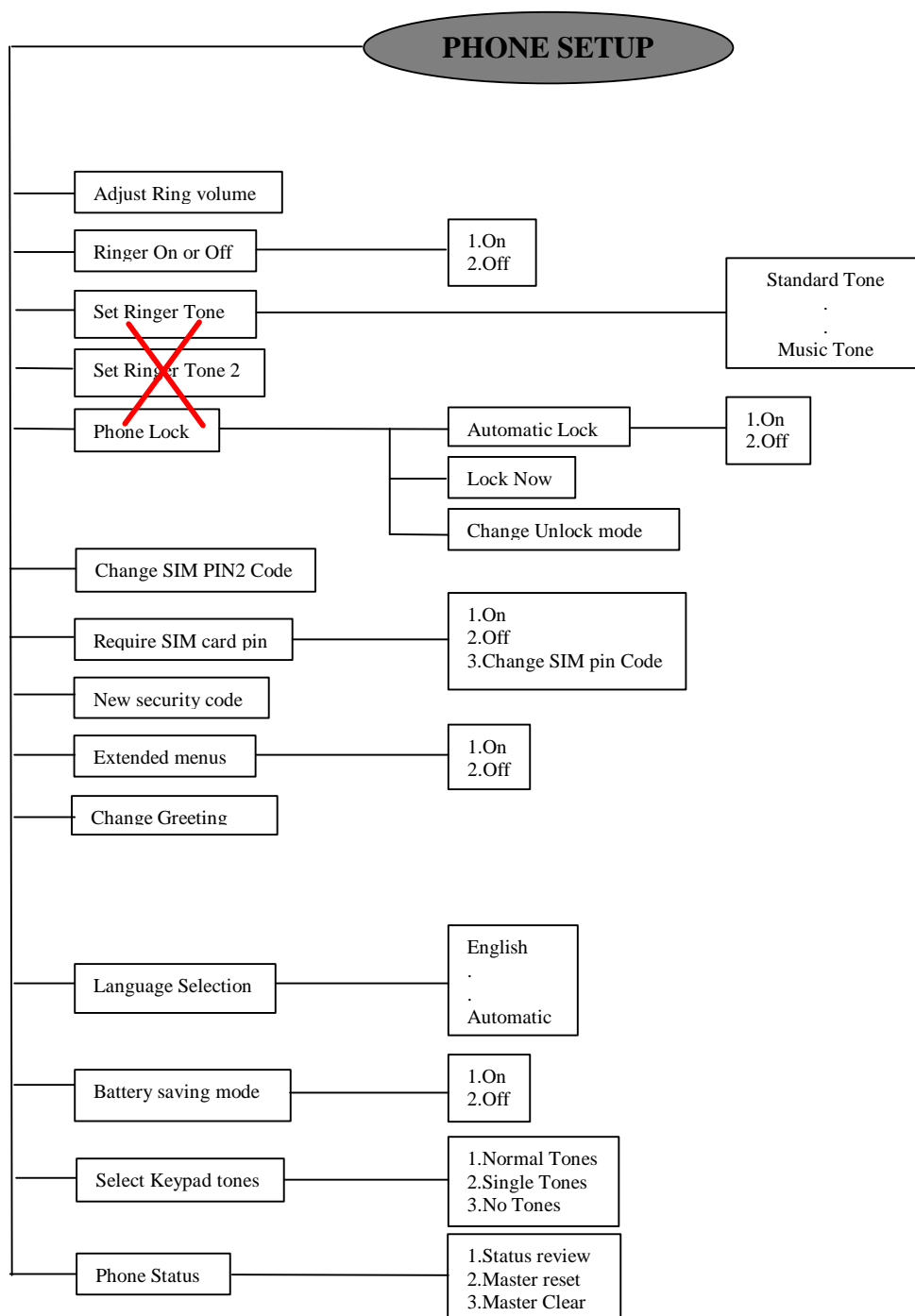
3.1 List of Features Available

Below are the list of Menu functions available at present.

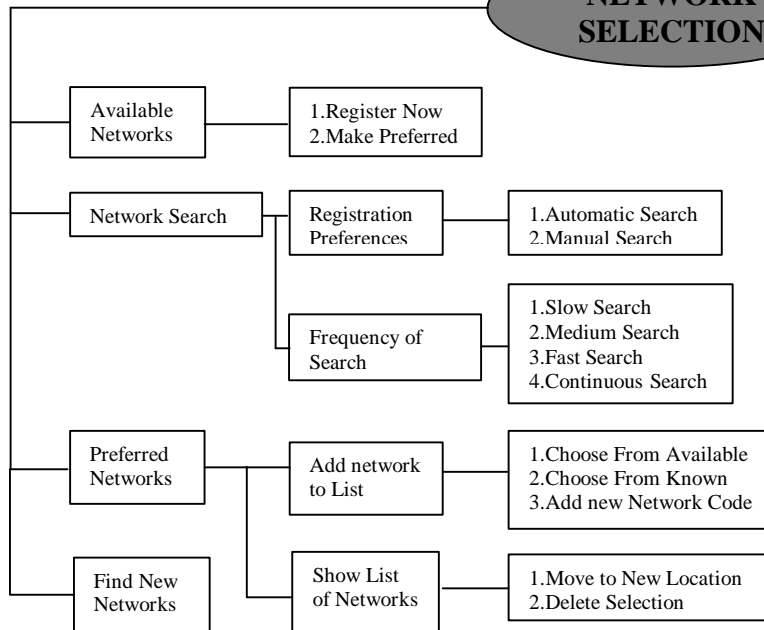




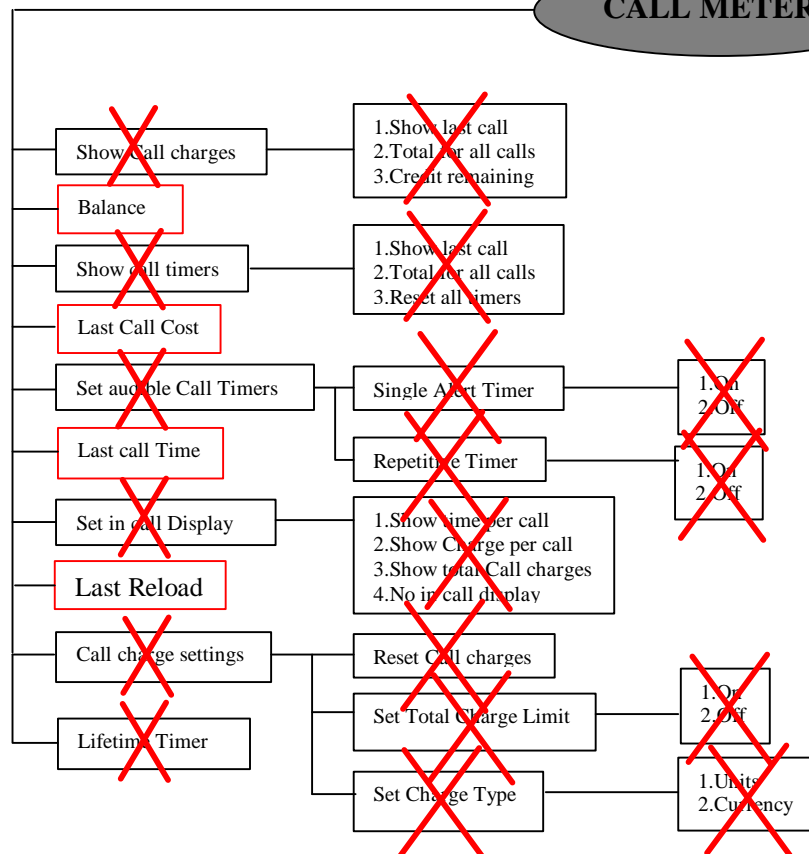


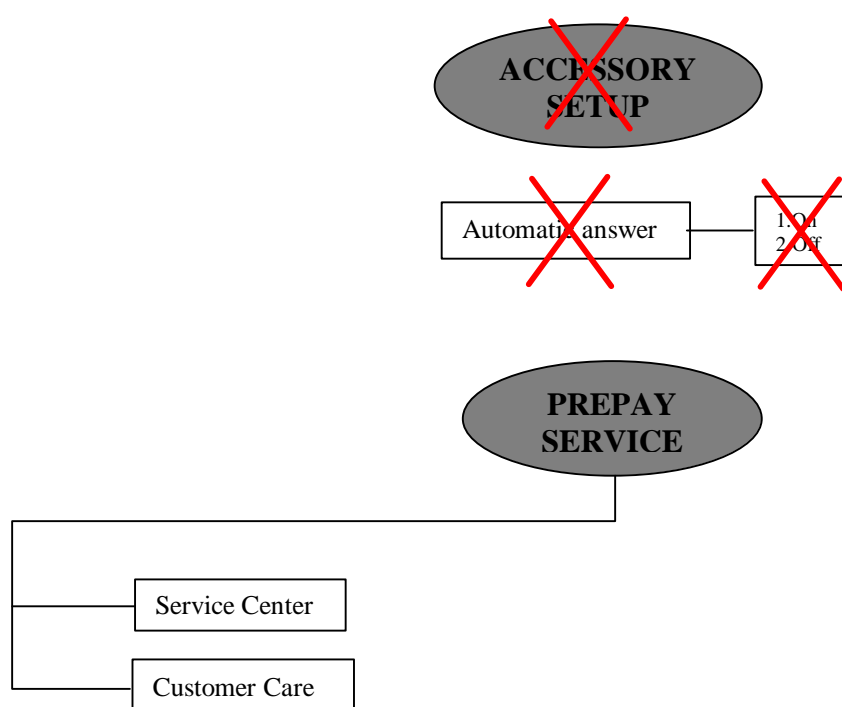


NETWORK SELECTION



CALL METERS





SECTION 4: DISASSEMBLY & PARTS

4.1 Disassembly Introduction

The M3588 is held together by 5 screws as other Modulus products, 1 of these screws is placed beneath the IMEI label, and 2 of these are placed below the Aux RF connector rubber cover. Care should be taken whilst removing the display flex cable as this can be torn or broken without too much stress being applied.

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 M3588.

- Anti-static Mat Kit - 0180386A82, includes:
Antistatic mat 66-80387A95
Ground Cord 66-80334B36
Wrist Band 42-80385A59
- Plastic Bladed Tool SLN7223A
- T7 Torx Driver

4.3 Disassembly Procedure

The following set of diagrams will demonstrate the correct sequence and action required to disassemble the M3588

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 down on clip at pulling towards you.



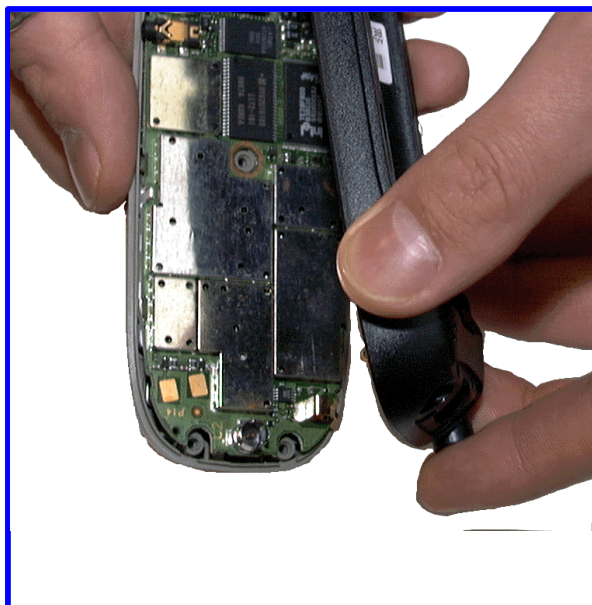
2. Remove battery by pushing and lifting at the same time.



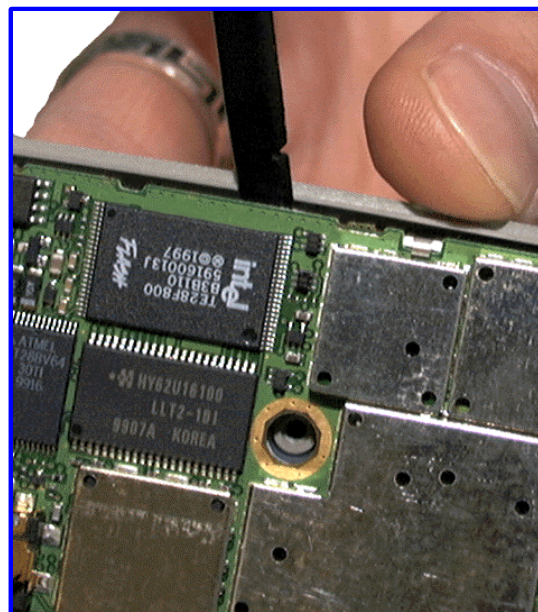
3. Remove Antenna by rotating Anti-clockwise



4. Remove all 5 screw (1 is situated under label and 1 is situated under RF Port cover by antenna)
(If Label is punctured, new label must be fitted)



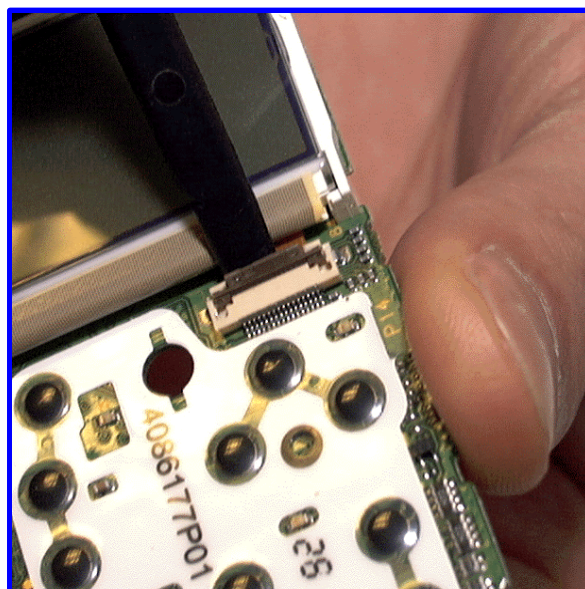
5. Separate Front and rear housings



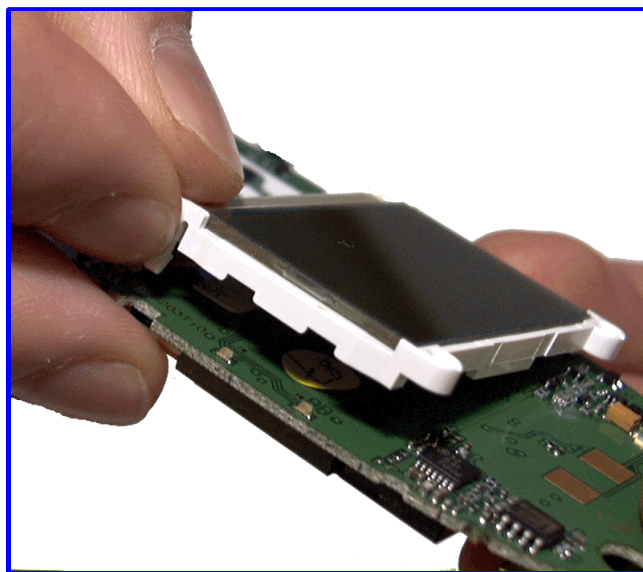
6. Remove PCB from front housing



7. Remove keypad from Front housing



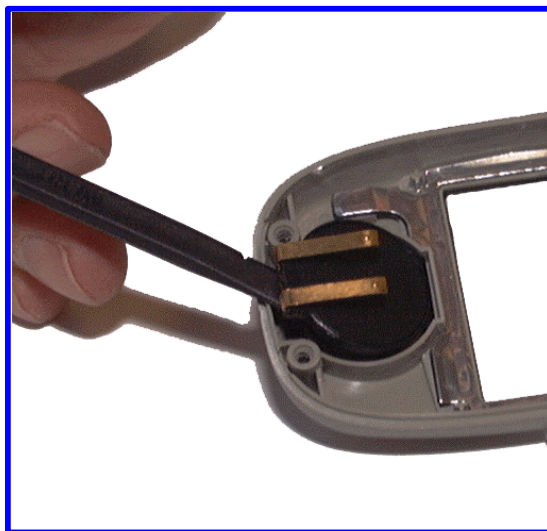
8. Carefully remove flex after prizing open Zif connector



9. Remove LCD module by pulling out and up on catches



10. Fit blade under speaker and carefully lift off from front housing



11. Remove Speaker from front housing, do not replace as adhesive seal will be damaged.

4.5 Exploded Parts Diagram **AAUG**



4.6 Replacement Parts

Xcvr Item Number			Stubby Antenna	8	8586155P01
Spare Xcvr Number	1	SE1062AK3B1	Speaker	9	5009150J03
Frnt Hsng Assy	2	0186157P01	Aux RF Cover	10	
Rear Housing	3	0186158P01	Keypad	11	7586133P02
SIM Cover	4	1586134P01	Keypad Domes	12	4086177P01
Batt Door	5	AAHN5106A	Alert Speaker	13	5009005J03
Lens	6	6186135P01	Screw	14	0309315B02
LCD	7	7202879Z63	Mic with pins	15	5009536H13

SECTION 5: SIM CARDS AND SECURITY

5.1 Manual Test Mode

The GSM Motorola M3588 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 8102430Z04) 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 approximately 3 second until 'test' appears on the display, and the correct commands must then be followed.

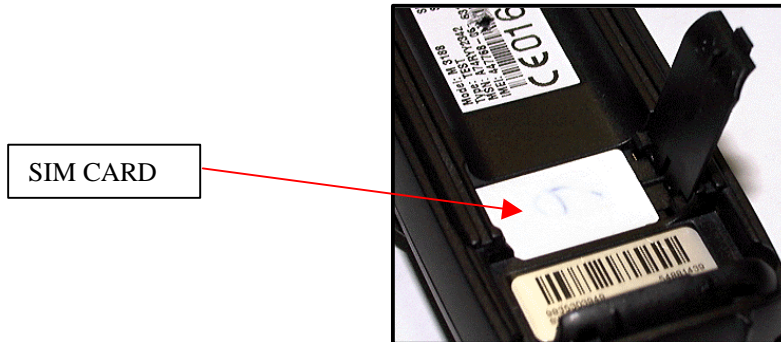


Figure 6.1 SIM Card insertion

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

Personality transfer on M3588 will be available via specially created software, this will be available shortly.

5.4 GSM Test Commands

This is a list of Level 1 and 2 Test commands available to M3588

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
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
51#	Enable sidetone
52#	Disable sidetone
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

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.

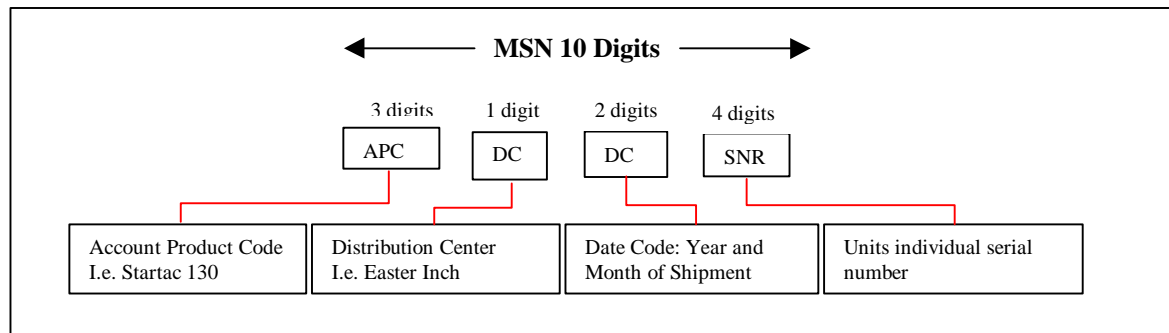


Figure 5.2 MSN label breakdown

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.

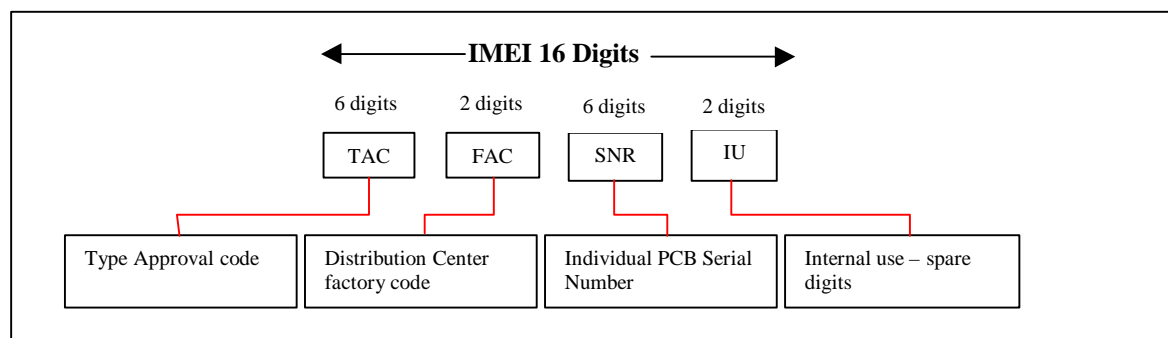


Figure 5.3 IMEI label breakdown

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

XCVR NUMBER: Identifies type of product. i.e. M3588 (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 M3588 is divided into 3 main sections when it comes to part replacability: The housings which contains the alert, speaker, flip, the main PCB which contains RF / Logic circuitry and the keypad and finally the display which connects to the main PCB via a ZIF connector. 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 M3588 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 M3588 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. If the battery voltage is <4.00 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 housings. 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) 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 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 LCD Module faulty.	Remove rear housing from unit, check general condition of flex connector from display. 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) LCD module is Defective.	Substitute a known good LCD module onto the suspect board and connect to DC Pwr supply depress PWR and ensure display is now correct, if Ok rebuild unit with new LCD module if LCD module 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 / 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 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 speaker and Logic/RF Circuit board defective.	Gain access to Logic/RF board as described in the DISASSEMBLY instructions in this manual. Check pads on the Logic/RF circuit board. Clean pads if necessary. If pad is at fault proceed to d. If connection is not at fault, Proceed to b.
	b) Earpiece Speaker defective.	Remove speaker from front housing and insert known good speaker. Place a call and verify improvement in earpiece audio. If better, reassemble the phone with the good speaker. If it was no better then 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 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.

SYMPTOM	PROBABLE CAUSE	VERIFICATION AND REMEDY
8. Phone does not sense when flip isb 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 front/flip assembly and proceed to b.
	b) Reed Switch defective	Gain access to RF / Logic PCB 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) 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. 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.
10. 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.

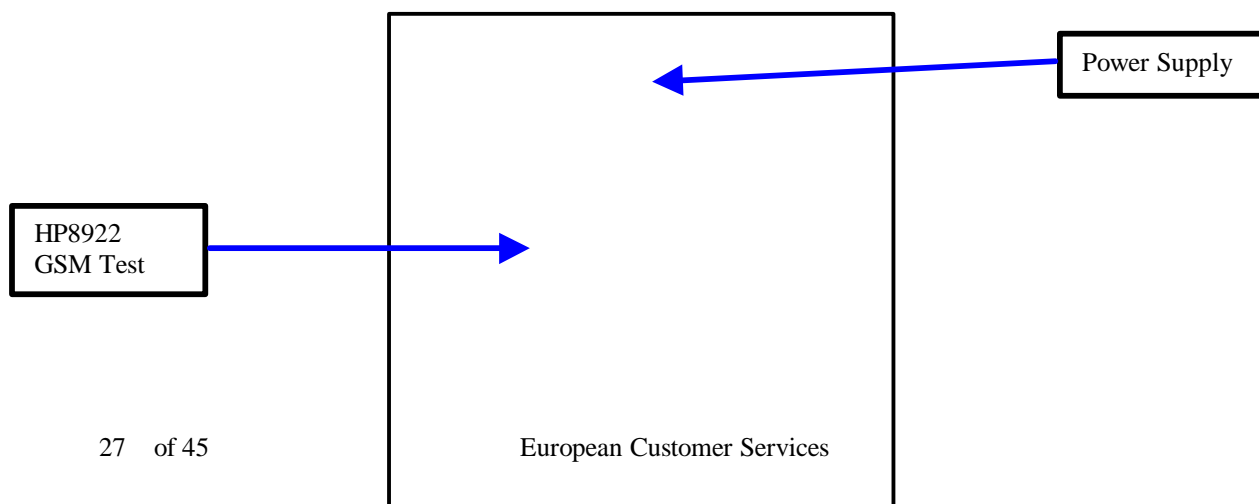
6.5 Software Upgrade

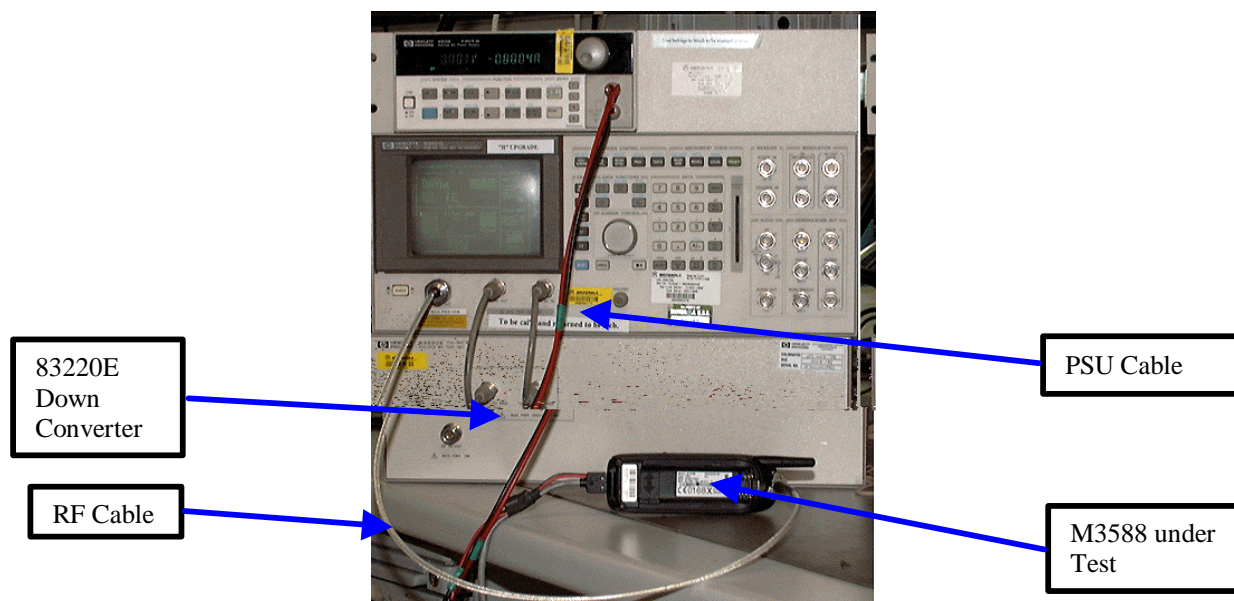
For information on setting up and equipment required for the flashing of software, contact should be made with the local technical support engineer.

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





NB* To test the PCB on its own without a housing or SIM card the unit must first be put into test mode and then into Tx or Rx mode using the applicable manual test commands. Ensure that a battery is present during this, as the battery acts as a SIM card presence detect for the unit. The PCB can then be taken out of the housing for any analysis.

SECTION 7: ACCESSORIES

7.1 Introduction

CLA (SYN5383B) and headset(SYN7453A) and Chargers SPN4365B/SPN4364B are compatible with Core Mod II.

New chargers allowing a 20% faster charging time are as follows:-

Charger 3 pin 230Vac, 7.5V	AAPN4005A
Charger, Aust, 7.5V	AAPN4006A
Charger, Euro/Bang 7.5V	AAPN4007A
Charger, HK 7.5V	AAPN4008A
Charger, Malaysia 7.5V	AAPN4009A
Charger, PRC 7.5V	AAPN4010A
Charger, Taiwan 7.5V	AAPN4011A
Charger, Switch Mode 8.1V	AAPN4003A

Modulus II magazine battery is not backward compatible to M-series phone. It needs a new magazine battery p/n. AAHN5112A / AANN4004A

SECTION 8: SALES MODELS

8.1 Dark Blue

SA0772AY2B

Euro Pkg 1	Thailand	Vietnam	Indonesia	Sri Lanka
	Cambodia	Pakistan,	Laos	

SA0773AY2B1

Euro Pkg 2	Phillipines	Brunie,	Mauritus,	Bangkok
------------	-------------	---------	-----------	---------

SA0774AY2B1

Plain Pkg Malaysia

SA0775AY2B1 India

SA0776AY2B1 Singapore

SA0777AY2B1 New Zealand

SA0778AY2B1 Australia

8.2 Champagne Gold

SA0779AG2B1 Australia

SA0780AG2B1 New Zealand

SA0781AG2B1 Plain Pkg Malaysia

SA0782AG2B1 India

SA0783AG2B1

Euro Pkg 1	Thailand	Vietnam	Indonesia	Sri Lanka
	Cambodia	Pakistan	Laos	

SA0784AG2B1

Euro Pkg 2	Phillipines	Brunei	Mauritus	Bangkok
------------	-------------	--------	----------	---------

SA0785AG2B1 Singapore

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 **
RBU	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