Alignment Procedure

Appendix A: Program Mode

Overview

The Program Mode can be accessed to enter and view information not normally accessed by the end user. Menu functions include:

* NAM Programming
* Authentication Key (A-KEY) Check
* Monitor Mode
* Test Mode
* Password Entry

Entry

The following steps are required to enter the Program Mode:

1) While in Normal Mode press and hold the **[*]** and **[#]** keys for 4 seconds. All the icons on the display will turn on and the phone will wait for the user to enter a password.

2) Enter the 8-digit password: **[3][2][2][1][8][5][9][1]**.
No keypad tone will be generated.
If the entered password is valid, "**PROGRAM MODE**" will appear on the display.
If the correct password is not entered within 10 seconds, operation will return to Normal Mode.

3) Press either **[/]** key to view the menu:

    1:   NAM PROGRAM
    2:   A-KEY CHECK
    3:   MONITOR MODE
    4:   TEST MODE
        5:   PASSWORD ENTRY

Press the **[SEND]** key to select the mode.

Menu Items

The following menu items are available in Program Mode:

- NAM Programming
- Authentication Key (A-KEY) Check
- Monitor Mode.
- Test Mode
- Password Entry

NAM Programming

This function programs the NAM parameters.
The NAM parameters are programmed as follows:

1)   Select the NAM PROGRAM function after entering the Program Mode.

2)   Enter the NAM number (**[1]** or **[2]**) to be programmed.

3)   The NAM parameter (starts from   "SID") along with the NAM number selected will appear in the top line of the display. The data associated with the selected parameter appears in the bottom line of the display. The NAM parameters are selected for editing by pressing either the **[▲]** or **[ ]** key. Enter the desired value for each NAM parameter.

4)   Press **[SEND]** to store the NAM data to non-volatile memory after editing the parameters. If the NAM data is stored successfully, the "**STORED**" message will appear on the display.   If an error is encountered, the "**FAIL**" message will appear on the display.

Note: Press the **[MENU]** key to go back to NAM number prompt.
        Press the **[END]** key to exit Program Mode and go back to Normal Mode.

Authentication Key (A-KEY) Check

This function is used to check the 6 to 20-digit A-KEY.

The A-KEY is checked as follows:
1)   Select the *A-Key Check* function after entering the Program Mode. Choose which NAM the A-Key is to be checked. Choosing "1" will select NAM 1 and the NAM1 MIN will appear in the display. Choosing "2" will select NAM2 and the NAM2 MIN will appear in the display.
2)   Enter the 20-digit A-Key. Pressing **[CLR]** will erase the last entered digit.
3)   Press **[SEND]** to execute the A-KEY verification procedure.
4)   If the entered A-Key is the same as the stored A-Key in EEPROM, **"A-KEY OK"** will be displayed for two seconds. Operation will then return to Normal Mode. If the entered A-Key is different than the stored A-Key in EEPROM, **"A-KEY INVALID"** will be displayed for two seconds. Operation will then return to Step 2.

The user may press the **[END]** key at any time to exit the *A-Key Check* function and return to Normal Mode.

Monitor Mode

This function allows the monitoring of system related channel and call processing state information. When the "**MONITOR MODE**" is selected, status information will appear on the display and be updated once a second. This function can only be stopped by a power cycle.

A description of each of the information fields is as follows:

     CCCC: Channel Number 0001-0799, 0991-1023
     T: Type Of Channel   "C" for Control, "V" for Voice
channel
     SSS: Signal Strength 000 to 255
     C: Digital or SAT Color Code 0 to 3
     P: Power Level 0 to 7
     WW: Number of Word Syncs received

CC: Call Processing State (see table below)

CC #	CP State
00	NULL_STATE
01	INIT_STATE
02	PAGING_SEL_STATE
03	IDLE_STATE
04	REG_STATE
05	ORD_CONF_STATE
06	PAGE_RES_STATE
07	ORG_STATE
08	AWAIT_MSG_STATE
09	AWAIT_REG_CONF_STATE
10	WAIT_FOR_ORD_STATE
11	WAIT_FOR_ANS_STATE
12	CONV_STATE
13	REL_STATE

Test Mode

The Test Mode allows for the viewing and changing of various system related parameters. This feature is mainly meant for test purposes. Improper use of the Test Mode commands could result in corrupting the normal operation of the phone. No incoming or outgoing calls are allowed while in Test Mode.

Operation

1)   Select the Test Mode function after entering the Program Mode by pressing **[SEND]** at the Test Mode prompt. The "**OPCODE:**" message will appear in the display.
2)   Enter the desired Test Mode opcode (see Appendix B: Test Mode Command Opcodes for a detailed list of the opcodes and their usage).
3)   Press **[SEND]** to execute the test command. If additional data is required for the command, then the "**DATA:**" message will appear in the display; enter the data digits then press **[SEND]** to execute the command.
4)   Upon command success the word "**SUCCESS**" will appear on the lower display line. Upon command failure the word "**FAIL**" will appear in the lower display line.
5)   Enter opcode **3F** (**Reset)** at any time to exit Test Mode and return to Normal Mode.

Editing

Either a normal digit or a hexadecimal digit can be entered while in Test Mode. The **[CLR]** key can be used to delete a digit. To enter a normal digit simply enter the digit by pressing a single key. To enter a hexadecimal digit first press the **[#]** key followed by a digit **[0-5]** key. See the following table for a mapping:

Keypress	Hex Digit
[#] [0]	A
[#] [1]	B
[#] [2]	C
[#] [3]	D
[#] [4]	E
[#] [5]	F

NOTE: Improper use of the Test Mode commands could result in corrupting the normal operation of the phone.

Password Entry

This mode allows the user to view or edit the 4 digit security password. This feature is provided as a failsafe in the event the user should lose or forget the current password. The security password can be viewed, edited, and saved as shown below.

Appendix B: Test Mode Command Opcodes

Opcodes

The following is a table describing the Test Mode Command Opcodes and their usage:

OP CODE	COMMAND NAME	DATA INPUTS	DESCRIPTION
11	EEPROM Write	XXYYZZ	XX - Segment Number (hexadecimal) YY - Offset in bytes (hexadecimal) ZZ - Byte value to write (hexadecimal)
1F	Suspend		Resets the Phone
3F	Restart		Returns to Normal Mode operations.
64	Transmit Data (TDATA)	00 - FF	Single byte of data is replicated into 5 FSK words on transmittal
70	Ear Speaker On		
71	Ear Speaker Off		
72	Ear Speaker Volume	0-5	
73	Microphone On		
74	Microphone Off		
80	Initialize		Sets modem and audio processor into default states.
81	Carrier On		
82	Carrier Off		

83	Load Synthesizer	0 - 9999	The decimal channel number value. Channel is assigned. Assumes BIS is On, Max Busy and Max Seize Attempts are set to 2. Channel Type is CONTROL. Stream is set to STREAM_A. Receive only is set to FALSE. SCC is set to 1.
84	Set Attenuator	0 - 7	After initial setting of Attenuator, level may be changed by pressing either [UP] or [DOWN]. Display will change to indicate new level. Pressing [MEM] will store the chosen level to EEPROM.
85	Receive Audio Mute		
86	Receive Audio Unmute		
87	Transmit Audio Mute		
88	Transmit Audio Unmute		
8F	ST On		
90	ST Off		
95	Version		Retrieves and displays the firmware version number
96	ESN Read		Retrieves and displays the ESN
A0	SAT On	0 - 2	SAT on at frequencies: SAT 0 - 5970 SAT 1 - 6000 SAT 2 - 6030
A1	SAT Off		
A2	Transmit Diagnostic Data	0000000000 - FFFFFFFFFF	Five data bytes entered. Sixth data byte is generated and sent as 0.
A3	Hi Tone On		

A4	Hi Tone Off		
A5	Lo Tone On		
A6	Lo Tone Off		
AA	DTMF On	'0'-'9', '*' or '#'	
AB	DTMF Off		
B4	Compander On		
B5	Compander Off		
CF	Transmit Diagnostic Data Off		
DD	DTMF Detect		Display will clear. Detected DTMF digits will appear in the display until the [END] key is entered.

Test Mode Command Opcodes

EEPROM Segment Numbers

The following is a list of EEPROM segment numbers to be used with the Test Mode Command Opcode 11 (EEPROM Write).

EEPROM SEGMENT	SEGMENT NAME
05	User Interface - User Settings
00	User Interface - Call Timers
06	User Interface - Last Dialed Number
07	User Interface - Phone Directory 1-50
08	Call Processing - Permanent Data
01	Call Processing - Semi-Permanent Data
09	Call Processing - NAM 1 Data
0A	Call Processing - NAM 2 Data
02	Call Processing - SSD for NAM 1
03	Call Processing - SSD for NAM 2

OB	Monitor and Test - Fault Log	
OC	Device Driver - Calibration Data	
OD	Debit Phone Permanent Data	
O4	Debit Phone Semi-Permanent Data	
OE	Unused	
OF	Unused	

EEPROM Segment Number Assignments

Glossary

AMPS	American Mobile Phone System
ACCOC	Access Overload Class
DTMF	Dual Tone Multiple Frequency
EEPROM	Electrically Erasable Programmable Read Only Memory
ESN	Electronic Serial Number
Flash	Sending of the Signaling Tone
GIM	Group Identification Mark
IPCH	Initial Paging Channel
LCD	Liquid Crystal Display
LU	Local Use
MIN	Mobile Identification Number
NAM	Number Assignment Module
PIN	Personal Identification Number
RSSI	Radio Signal Strength Indicator
SAT	Supervisory Audio Tone
Scratchpad	Used to enter numbers during conversation
SID	System Identification
SSD	Shared Secret Data
ST	Signaling Tone