

GLOBENET™

M-AXS Telephone Control Unit

Multi Line Least Cost Routing / Store and Forward / Call Back Dialer

Programming Manual

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LIMITED WARRANTY

TERMS AND CONDITIONS

Warranty

- 1) Telcom Research warrants that each unit of the Globenet™ M-AXS Telephone Control Unit is free from defects of material or workmanship; this warranty is limited as follows:
 - a) In respect of Parts, unless otherwise specified, for a period of 15 months from the recorded ship date from our office. Each such replacement part is warranted for the balance of the original 15 month warranty.
 - b) In respect of labor required to remedy defects in equipment or workmanship, for a period of 15 months from the recorded ship date from our office. Such labor is warranted for the balance of the original 15 month warranty.
- 2) Telcom Research may, in its sole discretion, repair defective Parts or replace it with new or comparable remanufactured parts.
- 3) Labor under this Warranty is limited to one (1) year.
- 4) This warranty does not apply to any of the following:
 - a) Equipment outside Canada;
 - b) Damage to Equipment caused or occurring during shipment of Equipment;
 - c) Equipment which has been damaged by misuse, neglect, abuse, accident, lightning, excessive voltage, mechanical shock, water damage, alteration, improper installation or for any reason other than innate defect or reasonable wear and tear; or
 - d) Equipment which has been serviced or altered except by Telcom Research.
 - e) Any Certification Labels have been removed damaged and/or altered in any manner.
- 5) The Purchaser is responsible for removal, repackaging, delivery charges, and reinstallation in respect of all warranty work.
- 6) The Purchaser must assume responsibility and expense for the proper packaging, shipment, and all costs associated with the delivery of the equipment to and from the Telcom Research manufacturing facility.

Force Majeure

Telcom Research shall not be liable for any delay or for failure to perform its obligations hereunder resulting from any cause beyond Telcom Research's reasonable control, including but not limited to fires, explosions, floods, strikes, work stoppages or slow downs or other industrial disputes, accidents, riots, or civil disturbances, acts of civil or military authorities, inability to obtain licenses or consents necessary to service the Equipment, delays by suppliers or material shortages, or acts of third parties.

Limitation of Liability

Telcom Research shall have no liability for property damage or personal injury unless such damage or injury is directly caused by Telcom Research's negligence. In no event shall Telcom Research be liable for lost profits or for incidental, special or consequential damages, or for damages to related equipment arising out of or in connection with the sale, delivery, installation, performance or use of the Equipment.

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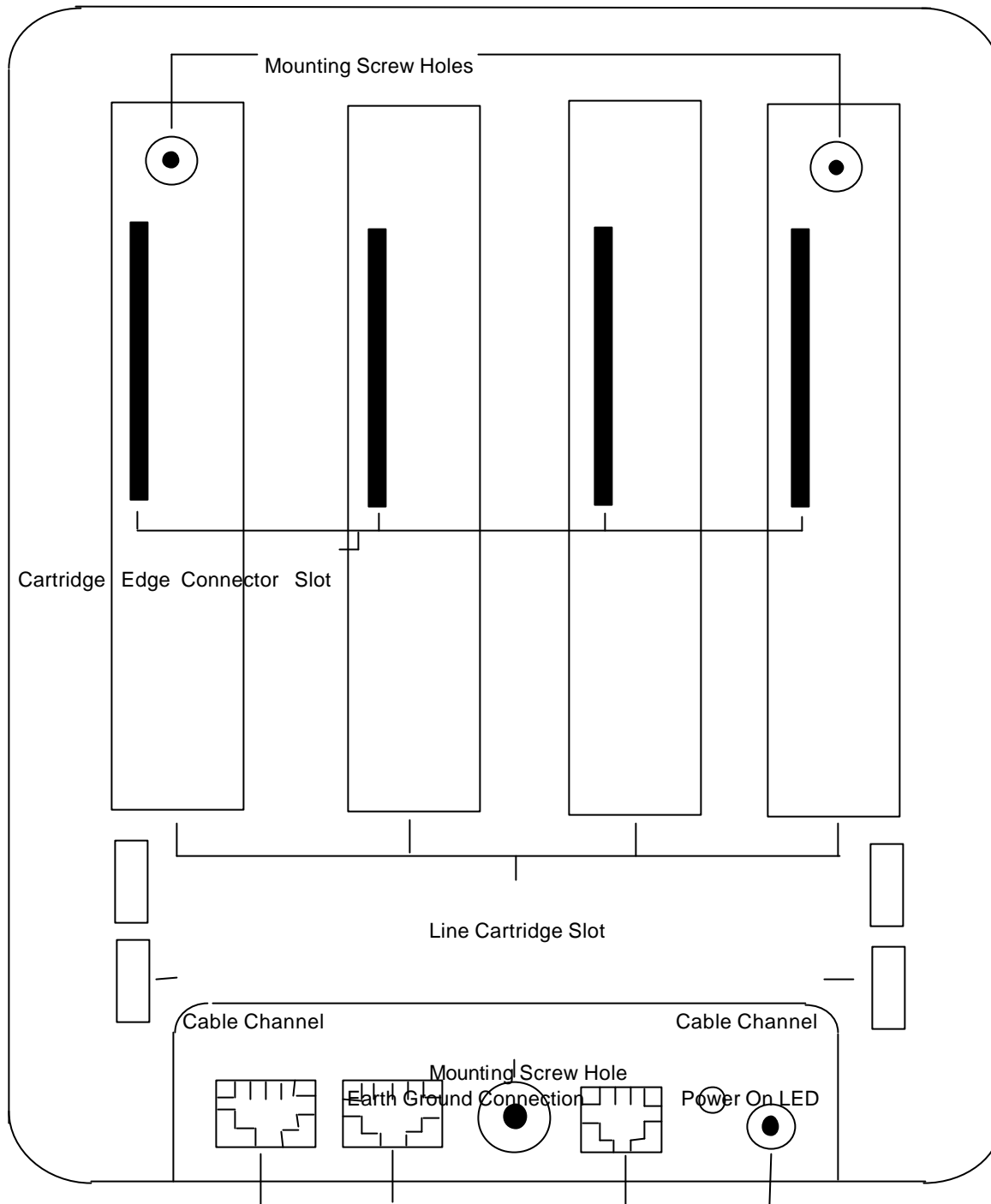
GENERAL DESCRIPTION

The **M-AXS** Telephone Control Unit is a multi-line **Series Dialer** used for **ROUTING** of telephone calls as required by Long Distance Carriers, Inter-Exchange Carriers, FAX Store and Forward Service Providers, and International Call Back Service Providers. **M-AXS** can easily be configured for these and other applications either via a PC connected to the Data Port, or via a Touch Tone Phone, locally or remotely. The **M-AXS** can be installed with a 2 to 8 port configuration. This expansion is possible with the addition of a maximum of 4 line cartridges, 2 ports per cartridge, to the main base unit. The power and versatility of the **M-AXS** is derived from its built in programming language. If one of the default configurations is unsuited to your application, you can always access the underlying programming language and tailor the operation of the **M-AXS** to your particular requirements.

FEATURES

- Microprocessor Controlled
- Fully Programmable
- Chaining / Cloning Capability
- Flash Memory
- Hot Swap Capability
- Non-Volatile Memory
- Real Time Clock with Battery Backup
- Series Mode Transparent Store and Forward Dialing
- Least Cost Routing Tables with a capacity of about 16,000 digits
- 90 General Purpose Number Bins, for Local Access Numbers, Auth. Codes, etc.
- 99 Speed Dial Bins
- Verified or Unverified User Codes
- Verified or Unverified Client Codes
- Loop Start Compatability
- DTMF Dialing, (towards Trunk or Drop) with variable speed from 50 to 450 MS.
- DTMF Detection, (From Trunk or Drop)
- Pulse Dialing towards Trunk (10 or 20 PPS)
- Pulse Detection from Drop (10 or 20 PPS)
- Switchable from Tone to Pulse and back within the same Program
- Call Progress Detection (Dial Tone, Busy, Ring Back) with programmable frequency and tolerance
- Programmable Delay from 1 to 9.9 seconds
- Off Keypad Dialing (A, B, C, D)
- Centrex/PBX Compatibility
- Compatible with Telephone Company Features (Call Waiting, 3 way calling, Voice Mail, etc.)
- Remote Programming using DTMF, from a standard touch tone telephone or PC/Modem
- Local Programming using DTMF, from a standard touch tone telephone
- Local Programming using the RS-232 Data Port.
- SMDR RS-232 Port
- Password Protection
- Programming playback
- Compatible in areas with and without interchangeable Office Codes and Area Codes.
- Programmable Timers (Off Hook, Dial Tone, Release-Reseize, etc.)
- X.25 Interface
- Pulse Metering
- Tone Cadence Detection
- Automatic Call Home Programming

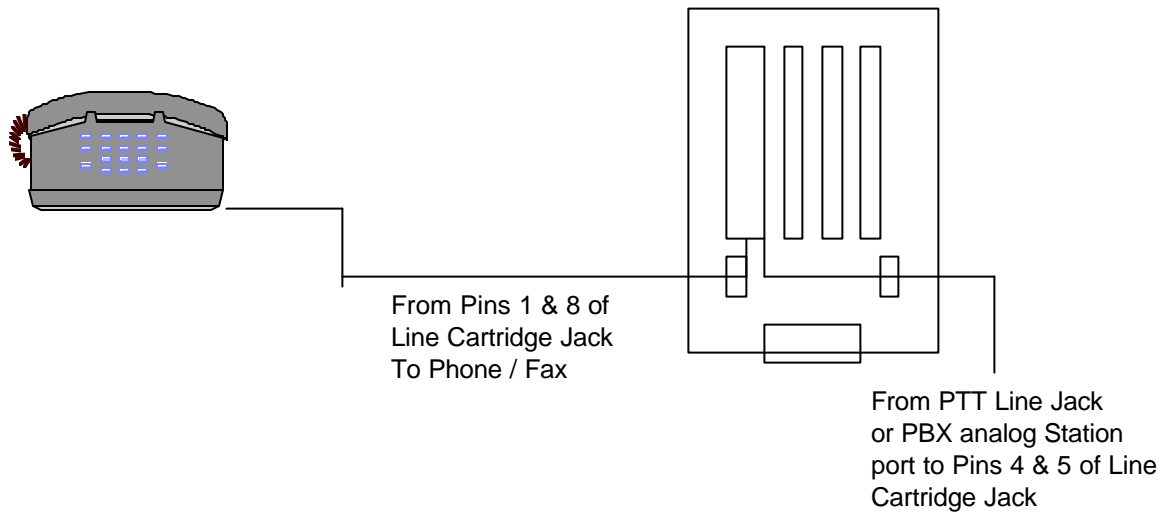
FRONT VIEW OF M-AXS MAIN UNIT



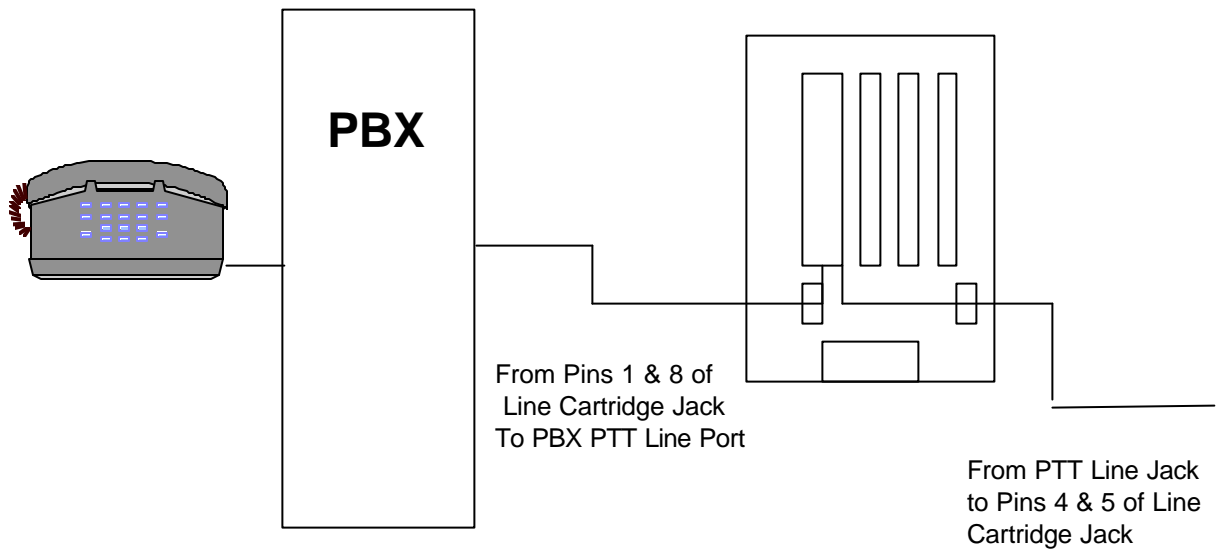
SMDR / Program Port ** X.25 Port ** Audio Input AC Adapter Plug
 RJ 45 Jack RJ45 Jack RJ12 Jack

** Com Port configuration of a Single Controller installation firmare version 1.03 or later. The configuration of these ports depends on whether Networking has been enabled and the Controller number within the Network.

Installation of the M-AXS



Dedicated Line or Between PBX and Phone



Between PBX and PTT Line

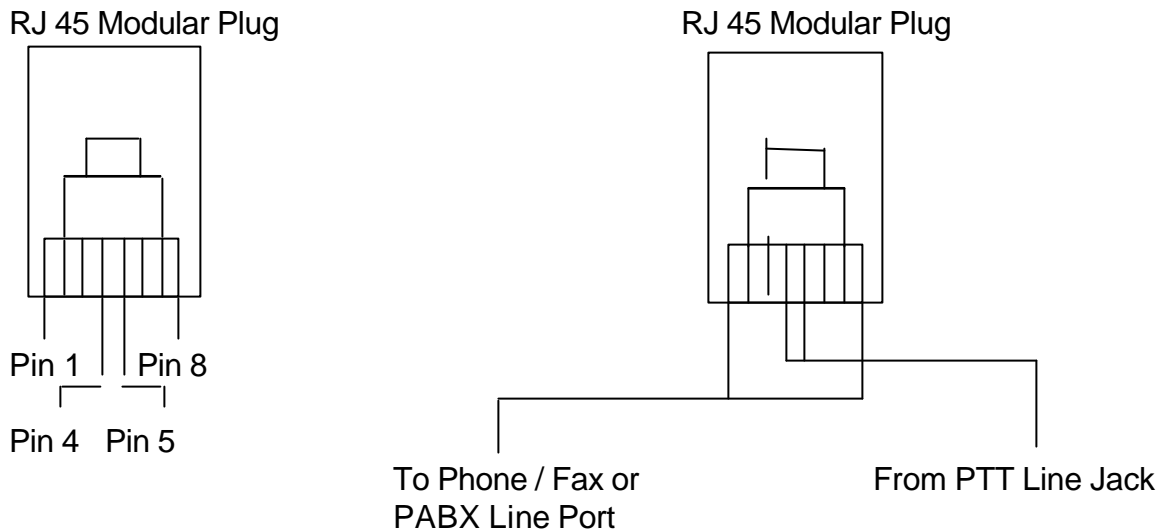
INSTALLATION OF THE M-AXS TELEPHONE CONTROL UNIT

The main base unit is to be secured to the wall, using panhead screws, through three mounting screw holes provided in the unit. The top mounting screw holes are in the first and fourth cartridge slots at the top. The single mounting screw hole at the bottom of the case is also used to provide a connection point for earth ground.

The required number of line cartridges is inserted into the line cartridge slots. The cartridge edge connector is inserted into the edge connector slot located in each cartridge slot. Each cartridge slot has tabs on both sides, top and bottom, that fit into slots on the cartridge. These guide the cartridge into the proper position and help lock it into place.

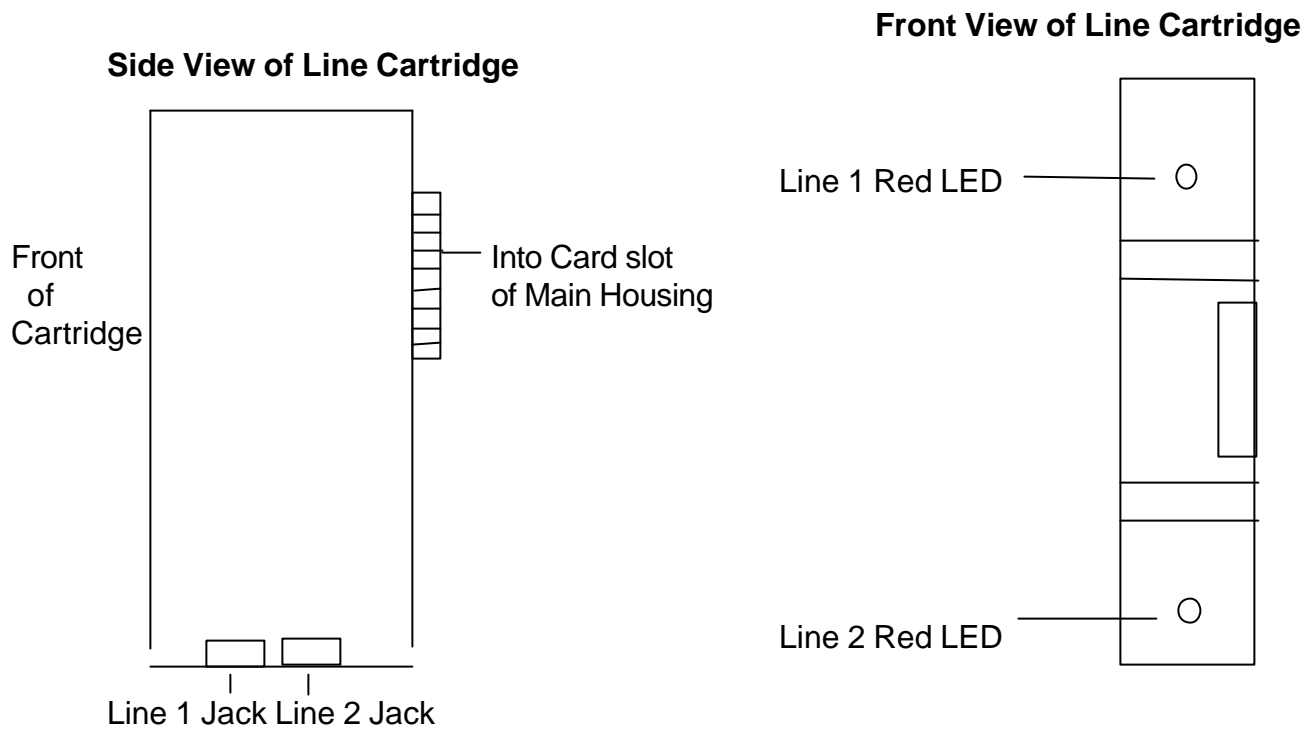
The PTT lines are connected to the Line Cartridges via the 8 pin jacks on the bottom of the cartridge. Each jack connects to one line of the PTT network. The PTT line is connected using an 8 pin modular plug that acts as both the input from the PTT, pins 4 and 5, and the output to the phone/fax or PBX port, pins 1 and 8.

CABLING



Contact	Description
1	Trunk Tip Out
2	No Connection
3	No Connection
4	Trunk Tip In
5	Trunk Ring In
6	No Connection
7	No Connection
8	Trunk Ring Out

Note: When installing a M-AXS base the unit must be properly grounded to a good electrical or earth ground to ensure proper operation and safety conditions.



SMDR / Programming Com Port Jack

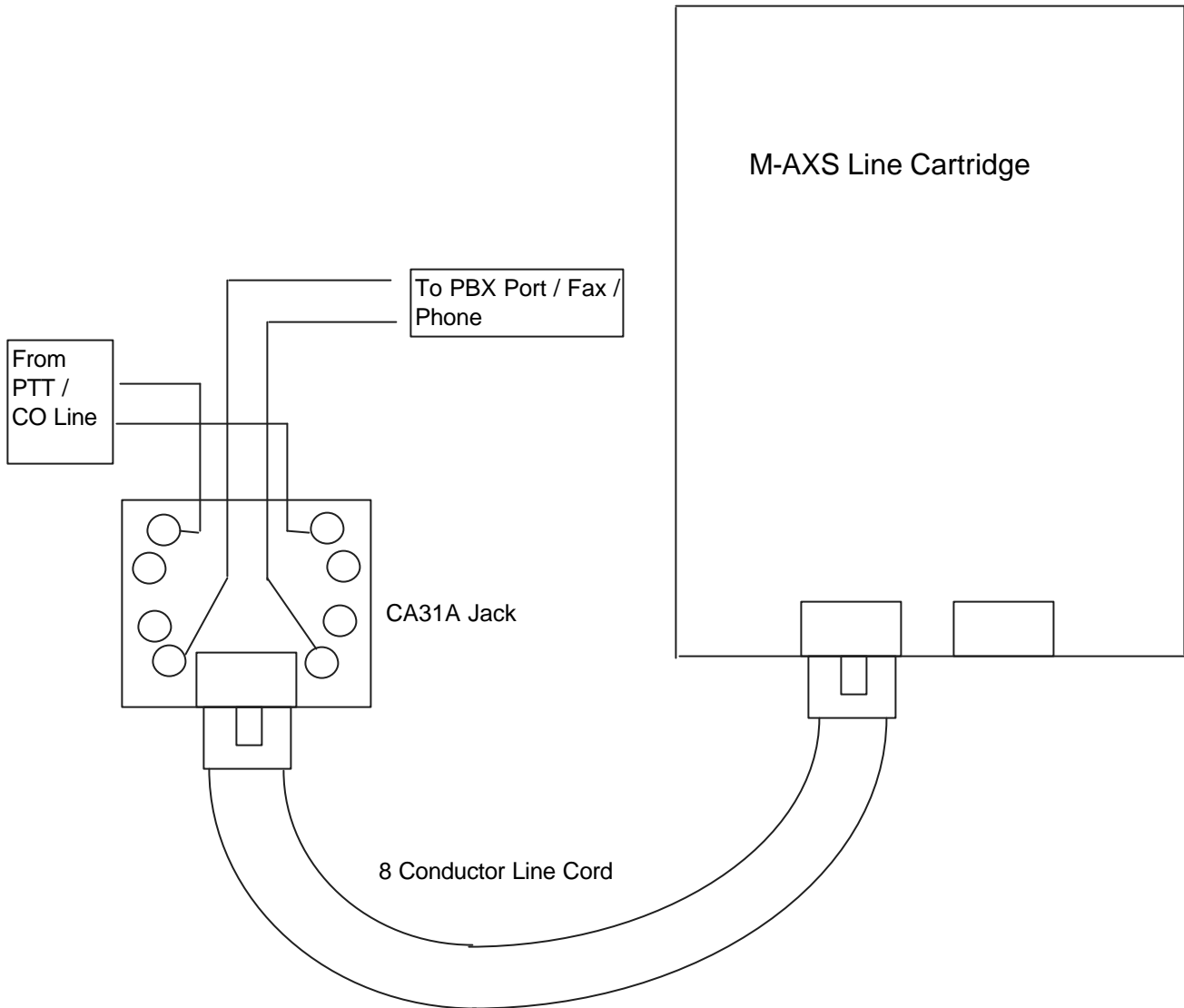
Contact	Description
1	DCD
2	
3	TXD (From M-AXS)
4	Signal Ground
5	
6	RXD (To M-AXS)
7	
8	DSR

X.25 Com Port Jack

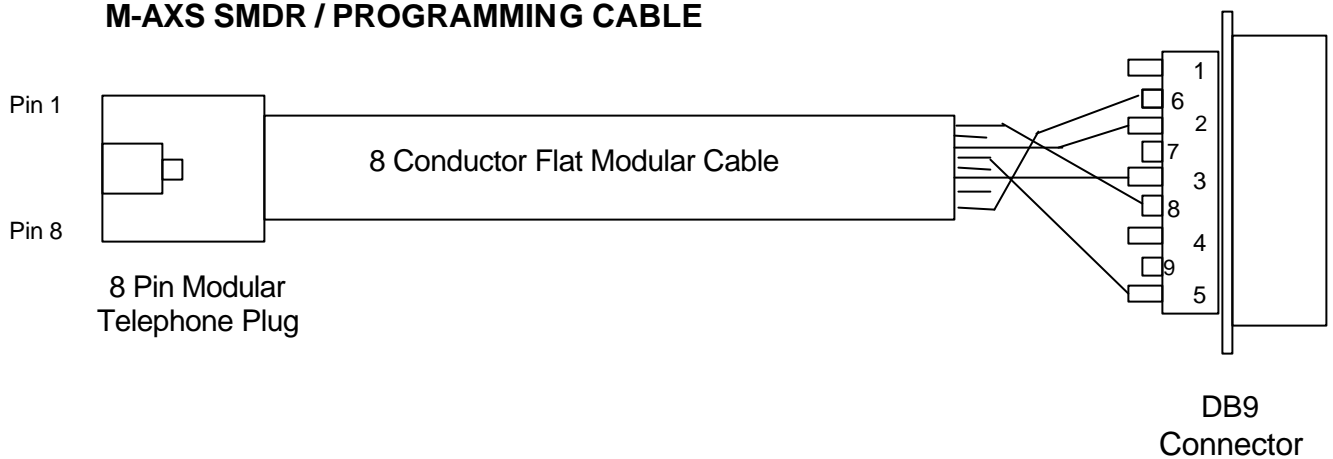
Contact	Description
1	DCD
2	
3	TXD (From M-AXS)
4	Signal Ground
5	
6	RXD (To M-AXS)
7	
8	DTR

M-AXS Cartidge Cable Kit

Cartidge Cable Kits, (Part Number MCC Kit) can be obtained from Telcom Research. The kits include the following 2 RJ31A Jacks, with shorting pins, and 2 - 8 Conductor Fully Modular Line Cords. These kits can be used to interface between the PTT line and the M-AXS Cartridges.



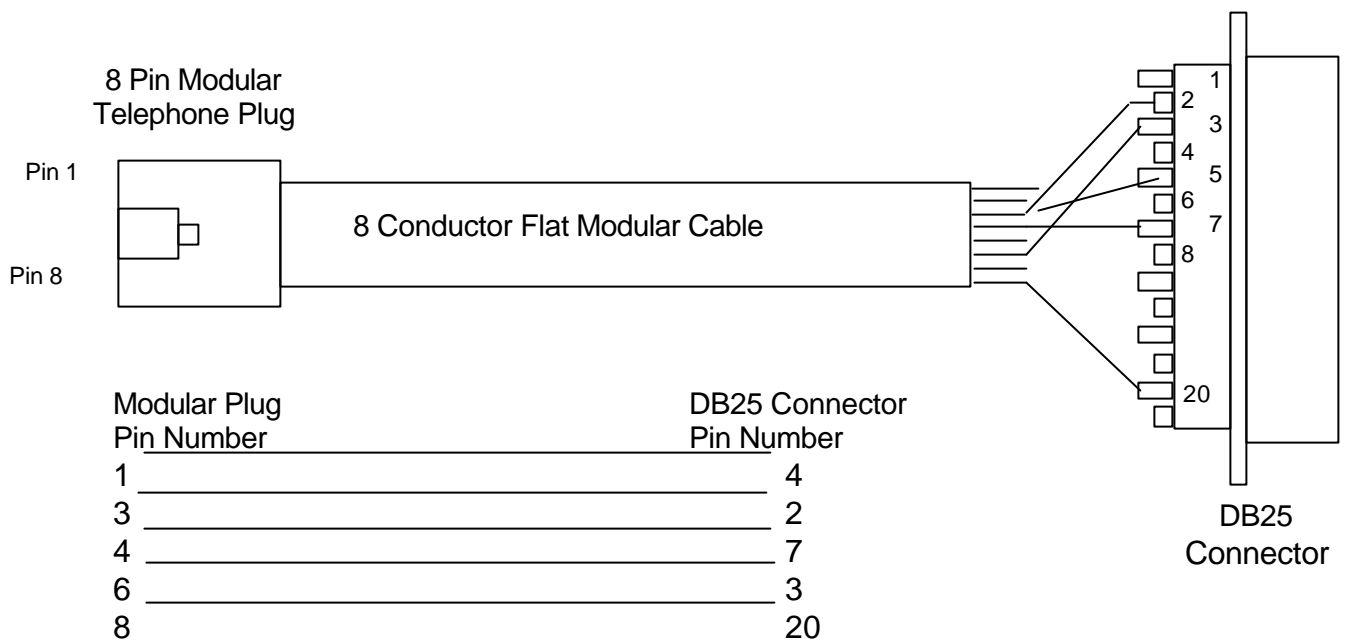
M-AXS SMDR / PROGRAMMING CABLE



Modular Plug Pin Number	DB9 Connector Pin Number
1	8
3	2
4	5
6	3
8	6

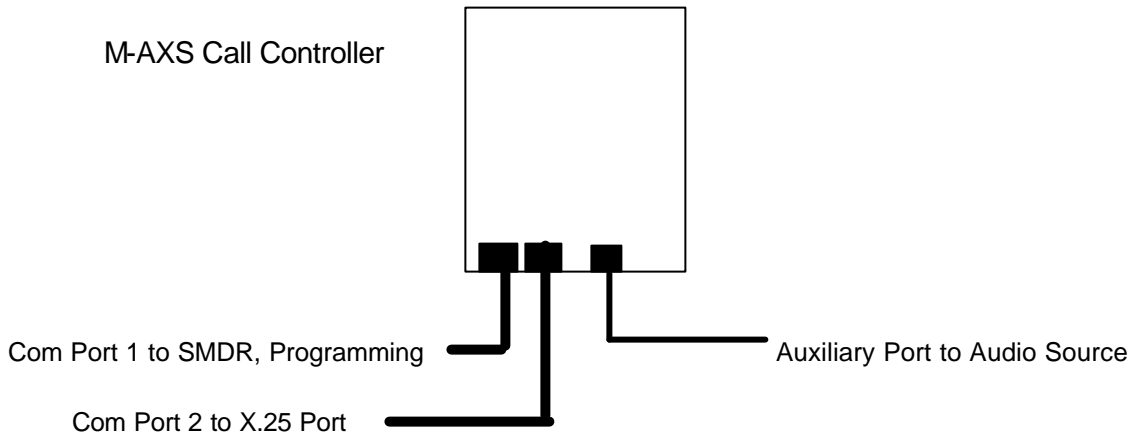
SMDR Cable Kits, (Part Number MSMDR Kit) can be obtained from Telcom Research. The kits include the following 1 DB9F connector, 1 DB25F Connector , 1 - 8 Conductor Modular Line Cord. **The adapter used with the AXS will not work with the M-AXS.**

M-AXS X.25 CABLE



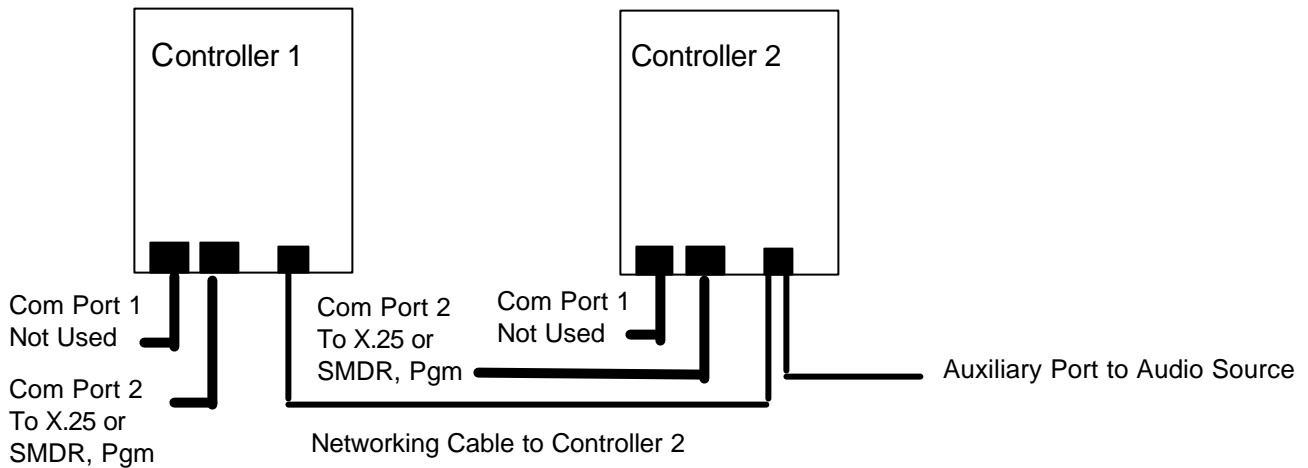
X.25 Cable Kits, (Part Number MX25 Kit) can be obtained from Telcom Research. The kits include the following 1 DB25M Adapter, 1 - 8 Conductor Modular Line Cord.

SINGLE CALL CONTROLLER INSTALLATION



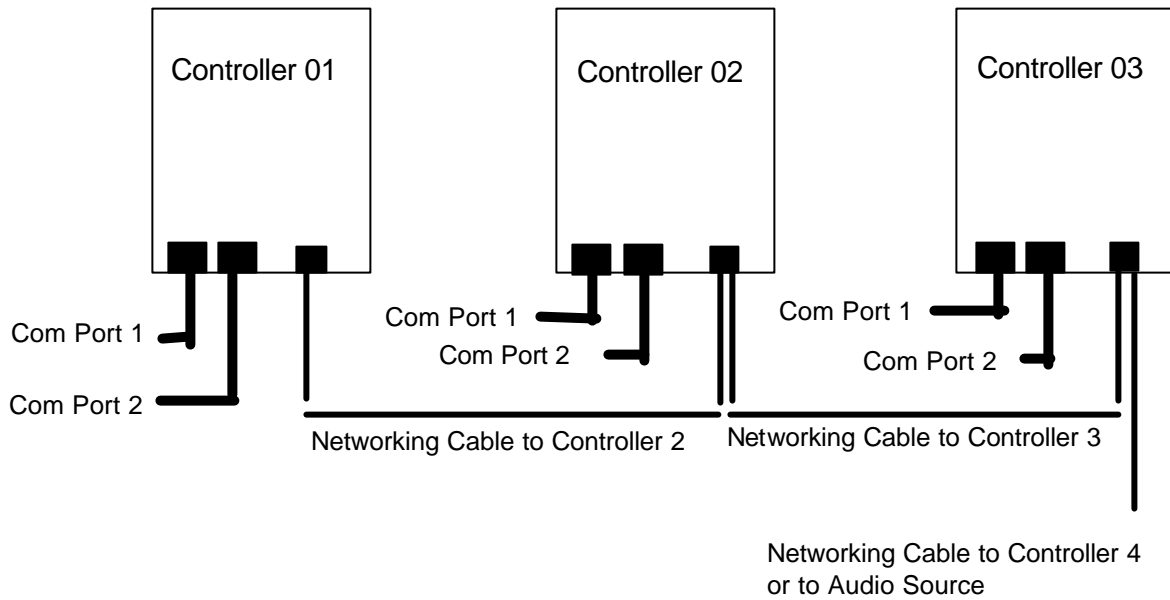
Network ID No.	Com Port 1	Com Port 2	Auxiliary Port
00	SMDR & Programming	X.25 Interface	Audio Input Audio Control Network Interface

TWO CALL CONTROLLER INSTALLATION



Network ID No.	Com Port 1	Com Port 2	Auxiliary Port
01- 15 (Unique)	SMDR & Programming	X.25 Interface or SMDR & Programming	Audio Input Audio Control Networking Interface
01 - 15 (Unique)	Not Used	X.25 Interface or SMDR & Programming	Audio Input Audio Control Networking Interface

3 - 15 CALL CONTROLLER INSTALLATION



Controller No.	Com Port 1	Com Port 2	Auxiliary Port
01*	SMDR & Programming	X.25 Interface	Audio Input Audio Control Networking Interface
02*	Not Used	X.25 Interface or SMDR & Programming	Audio Input Audio Control Networking Interface
03*	Not Used	X.25 Interface or SMDR & Programming	Audio Input Audio Control Networking Interface

* Each Controller requires an unique Network ID number from 01 - 15.

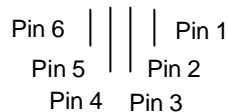
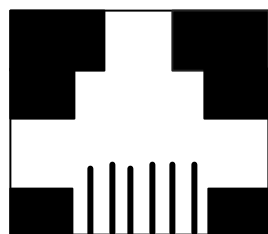
M-AXS Call Controller Port Configuration

Configuration	Network ID No.	Com Port 1	Com Port 2	Auxiliary Port
Single Controller Installation	00	SMDR & Programming	X.25 Interface	Audio Input Audio Control Networking Interface

2-15 Controller Installation

Controller 1	01-15 (Unique)	SMDR & Programming	X.25 Interface	Audio Input Audio Control Networking Interface
Controller 2	01-15 (Unique)	Not Used	X.25 or SMDR & Programming	Audio Input Audio Control Networking Interface
Controller 3 - 15	01-15 (Unique)	Not Used	X.25 or SMDR & Programming	Audio Input Audio Control Networking Interface

AUDIO PORT / NETWORKING JACK PIN-OUT



- Pin 1 ----- NETWORK
- PIN 2 ----- AUDIO CONTROL
- PIN 3 ----- AUDIO INPUT
- PIN 4 ----- AUDIO INPUT
- PIN 5 ----- AUDIO CONTROL
- PIN 6 ----- NETWORK

INITIAL POWER UP PROCEDURE

1. Connect a telephone set to the Drop side of one of the ports of the M-AXS.
2. Connect PTT dial tone to the Line side of the same port of the M-AXS.
3. Pick up the handset of the telephone.
4. Press the '*' key on the dial pad of the telephone.
5. Plug one end of the A/C adapter into the electrical outlet and the other end into the M-AXS while continuing to press the '*' key.
6. Continue to press the '*' key for 5 to 10 seconds or until the power on LED begins to flash. The line will split.
7. Release the '*' key and hear 7 '*' played.
8. Dial the desired reset code 00-99.
9. Hear 5 beeps.
10. Hang up the telephone handset. The dialer is now reset to the predetermined defaults.

M-AXS Reset Code

00

AXS Reset Code

1,2,3

Note:

The Power Up Reset can not be performed without a PTT line connected to the port you are using to perform the reset.

TECHNICAL SPECIFICATIONS

Physical:

	Base:	Line Module:
Size	8.5" X 7.5" X 2"	6.25" X 4" X 1.25"
Weight	1.51 lbs. / 700 grams	0.5 lbs. / 250 grams
Colour	Black	Black
Material	ABS Plastic	ABS Plastic

Specification	Min.	Typ.	Max.	Units
Power Requirement:				
Voltage	14	15	18	VAC RMS
Current	0.6	1.0	1.8	Amps
Operating Temp.	0	20	40	DEGREES C
Storage Temp.	-40	---	+85	DEGREES C
Humidity	0	---	85	% (No Condensation)

DTMF Receiver:				
Level	-35		+3	dB
Twist	-4		+4	dB
Frequency	-1.5		+1.5	%
Duration	45			MS

Rotary Receiver:				
Break/make	55/45	60/40	65/35	%
Speed	10		20	PPS

DTMF Sender:				
Level High	-7	-6	-5	dB
Low	-9	-8	-7	dB
Twist	1	2	3	dB
Frequency	-1.5		+1.5	%
Duration	50	Programmable		MS

Rotary Sender:				
Break/Make	59/41	60/40	61/39	%
Break/Make	64/36	65/35	66/34	%
Speed	10	10	20	PPS (Programmable)

OFF Hook AC Impedance:		
300-3500 HZ	600	OHMS

DC Resistance:				
On-Hook	10			M OHMS
Off-Hook	150	300	350	OHMS

Other:				
Insertion Loss			0.5	dB
Ring Freq.		14	90	HZ (Programmable)
Ring Voltage		25	140	VAC RMS

OPERATION

GENERAL

M-AXS contains 50 programs; One executed upon the user (Drop Side) going of hook (DROP PROGRAM); one executed when an incoming telephone call occurs (RING PROGRAM); and one of forty-six programs (PARALLEL PROGRAM) launched by either the RING or DROP program as a result of a search table match, or program instruction. There are 2 additional programs which perform specific functions. One is a default extension to extension calling program which is used if PBX compatibility has been activated. The second is a call home program which can be used to automatically call to a site for database updating, providing the 'home site' has the ability to automatically set up a data conversation with the calling dialer.

Programming is accomplished either via the RS-232 DATA PORT (if equipped) using a serial terminal, or by DTMF Tones, either locally or remotely generated.

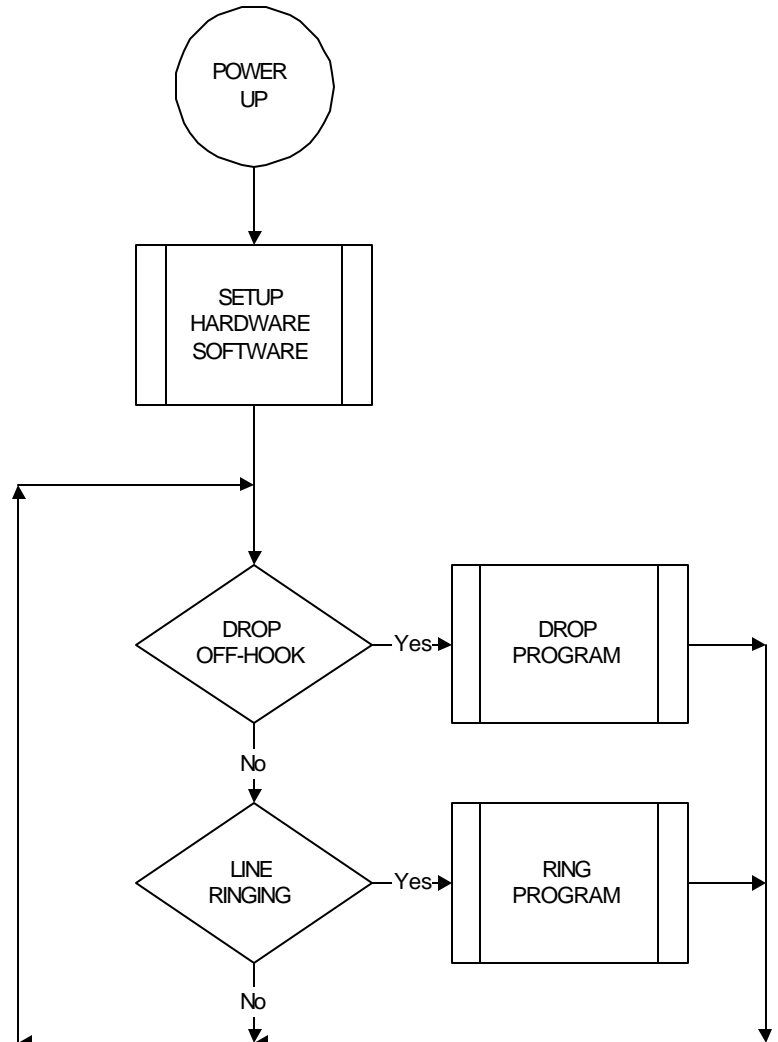
Programming provides control over the content of all Tables, Programs, Speed Dial Bins, General Purpose Number Bins as well as various system wide and line specific parameters.

TABLES

M-AXS utilizes 3 search tables for call routing. **Primary** (usually searched when a user dials a phone number), **Secondary** (Searched only after a match in the Primary Table has caused an ACTION to Occur), and **Pulse Meter** (Searched if pulse metering has been activated to determine the rate that the meter pulses will be sent).

M-AXS usually begins searching its Primary Table once a program (usually the Drop Program) executes a 700 or 701 instruction, and the user begins Dialing a phone number. When a match is found, the appropriate ACTION is taken. At this point, if the instruction executed was a 701, the Secondary table is searched for a match. Should a match be found, the ACTION being taken is stopped and the secondary tables ACTION will take precedence. This two table system allows for implementation of the following example:

- All Calls to 1416 are to execute Program 2
- All 976 calls are to execute Program 20
- Primary Table contains 1416 with Action 02 (Launch Program 2)
- Secondary table contains 1???976 with Action 20 (Launch Program 20)
- Program 20 contains the instruction 97 which will cause AXS to Hang-Up and give Re-Order Tone



When the user dials 1416 a match is found in the Primary table. This match causes program 2 to be executed. In the event however, the next 3 digits are 976, then a match will be made in the secondary table causing Program 20 to be executed, and program 02 to halt. Program 20 will execute the 97 instruction, disconnecting any call in progress, and providing the user with Re-Order Tone.

The Primary and Secondary Tables consist of the same 2 components; A phone Number to match (including wild cards) and an Action to be executed once a match is found. The Phone Number portion can be any length from 1 to 15 digits. If the user has Dialed only one digit, only table entries of one digit in length are checked for a match. When the user has Dialed 2 digits, then only table entries of two digits in length are checked for a match, and so on.

M-AXS has added two additional tables that are used in conjunction with the pulse metering feature. The first table, Pulse Meter Search Table, is similar to the call routing search tables in that it contains digits to match with an action code of which pulse metering rate table to activate upon the user dialing a phone number. The second table, Pulse Meter Frequency / Surcharge Table, defines the number of pulses and the time interval between pulses, at which the metering pulses are sent to the call accounting system.

PROGRAMS

M-AXS contains 46 Parallel Programs generally used for controlling the Trunk Side of the unit, a RING Program executed upon an incoming call, and a DROP Program executed when the user goes off hook. Programs consist of Programming Instructions which instruct M-AXS to do various tasks. The following is an example of a very simple program to dial directory assistance.

```

90      92      50 10 0      10 07 5551212 93      99
|       |       |           |                   |       |
|       |       |           |                   |       | \ Wait for Hang Up by User
|       |       |           |                   |       | \ Join Trunk and Drop
|       |       |           |                   |       | \ Dial 555-1212 (7 Digits)
|       |       | \ Wait up to 10 seconds for dial tone. If None Detected, continue anyway.
|       | \ Split Drop Side from the Trunk Side
\ Go Off Hook on the Trunk side
    
```

You can cause M-AXS to perform virtually any task with the program string instructions. You have full control of both outgoing and incoming calls via these Programs.

SPEED DIAL BINS:

M-AXS contains 99 Speed Dial Bins of up to 20 digits each. Speed Dial Bins are processed in the same manner as any number Dialed by a user. The Primary table is initially searched, followed by the secondary table. Speed Dial Numbers are inserted into the input buffer as if the user had dialed them himself. To access a speed dial number, the user must dial the Speed Dial Access Code (Default of #) followed by the two digit bin number (01 to 99)

Speed Dial Bins can be programmed during program mode, but can also be maintained by the user. For a user to program a speed dial bin they simply place the Drop Telephone in the off-hook condition, dial #* followed by the two digit bin number, followed by the phone number to program in. Termination of the entry is done by entering *# The following is an example of programming into bin 15 the phone number 555-1212.

```

Go Off-Hook           Hear Dial Tone
Dial #*              Hear a Beep
Dial 15
Dial 5551212
    
```

Dial *#	Hear a Beep
Hang-Up	

After Dialing the *# and hearing the beep, you can immediately dial another bin number and program another bin.

If CENTREX compatibility is active, then the Speed Dial Bin must also contain the CENTREX Access code to be used (Eg: 9-555-1212).

If you do not wish the user to have access to speed dial, simply assign a speed dial access code of "A", "B", "C", or "D". Since the user cannot dial these digits, they will not be able to access the feature.

GENERAL PURPOSE NUMBER BINS

M-AXS contains 20 General Purpose Number Bins of 20 digits each, for holding commonly used Number Strings. Number Bins 01 to 10 are global bins while bins 11 to 20 are specific to each line. This means that recalling the bins 1 to 10 in the different program strings will always dial the same numbers regardless of the line being used. However, if bins 11 to 20 are recalled in the different programs strings, and the bins have been programmed for each specific line, the program will dial different numbers depending on the line that is being accessed. Items such as Local Access Phone Numbers, Authorization Codes, etc. may be programmed into a Bin. Using the BIN system, M-AXS may be pre-programmed with a common set of RING, DROP, and PARALLEL programs. A technician in the field need only enter the Local Access Number(s) and Authorization Code(s) in the appropriate bins to configure the Dialer for a particular customer.

SYSTEM PARAMETERS

M-AXS system wide parameter settings (Interdigit Timeouts, Access Codes) and line specific parameters (DTMF Dialing Rate, Pulse Dialing Rate) may be programmed. This allows adaptation for different services and country requirements on a per line basis.

M-AXS PROGRAMMING

Programming of the M-AXS dialer can be accomplished in one of two ways, either via a touch tone telephone or the Windows based program shipped with the dialer. Both of these programming methods allow you to customize your M-AXS programs and system parameters so that it can meet the needs of the Network it is working in to. Programming can also be done either locally or remote.

TOUCH TONE TELEPHONE PROGRAMMING

It is possible to input your database from a touch tone phone after you have entered the programming code referred to as the WAKE-UP code. This is accomplished by dialing your code string on the dial pad. Once you have entered the data string into the dialer, it will return a confirmation or error tone.

P.C PROGRAMMING

It is possible to input the database required to have M-AXS perform the call routing necessary for your application, check it for accuracy and then Upload it into the dialer via it's RS232 port. Once you have installed the *Zoo Keeper*[®] Dialer Maintenance Program into your computer's Windows program you can begin to customize the database. All the dialers programming can be configured here, stored in a database and recalled for Uploading whenever it is required.

Once this information has been input into the database and you have checked it for accuracy it can now be Uploaded into the M-AXS. Before you begin Uploading you can choose which parts of the database you wish to Upload into the dialer. *Zoo Keeper*[®] also provides the interface to do online programming and remote maintenance.

DROP PROGRAM

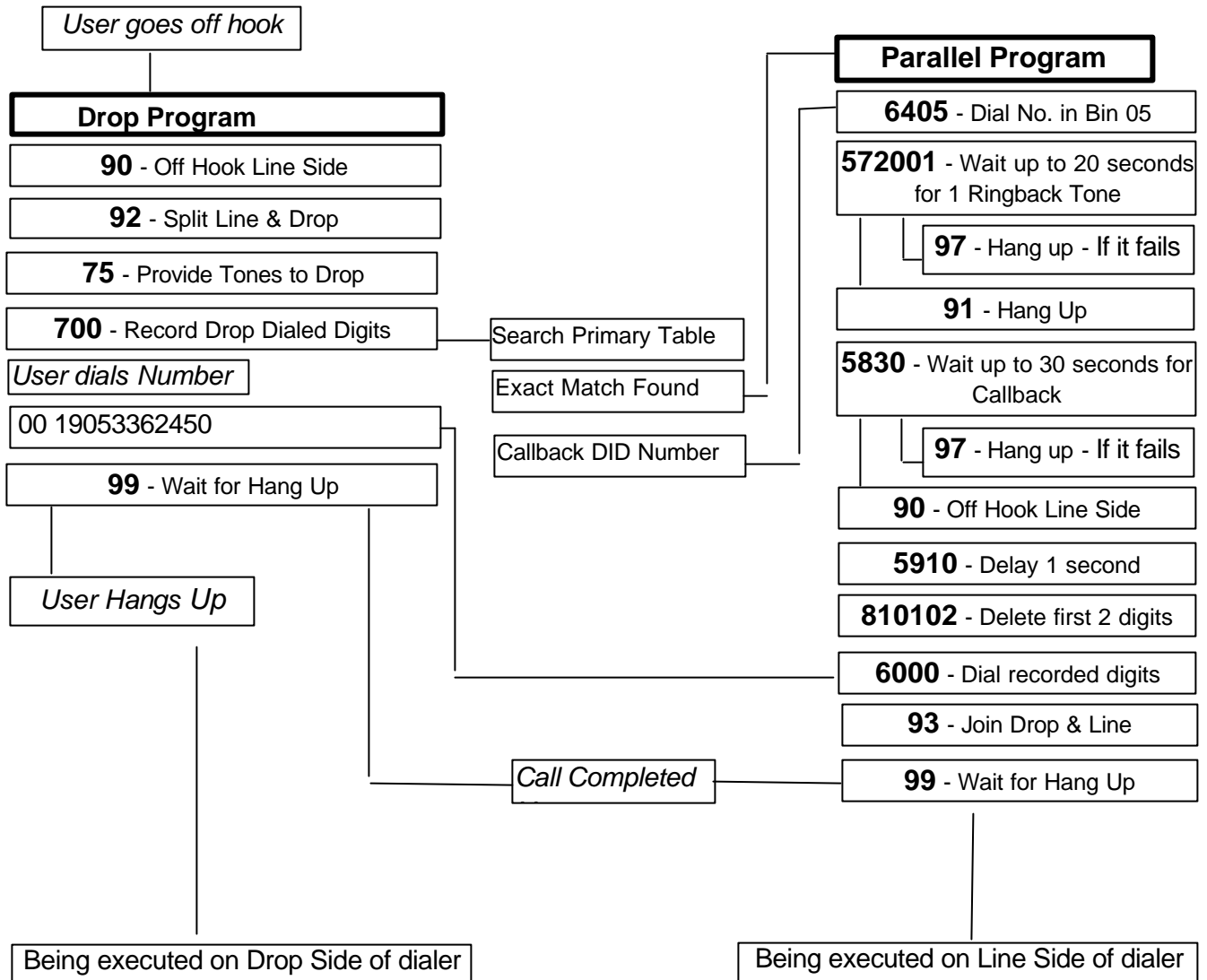
This program is used to define how the M-AXS will interact with the User. The DROP PROGRAM defines what the User will hear (i.e. Call Progress Tones) and what actions to take when the telephone goes off hook (i.e. look at the Search Tables to determine what trunk group to place the call over). In certain installations it may be desirable to have the Drop Program to perform differently on a per line basis. You now have the ability to assign any of the parallel programs as the Drop Program. Program 21 is the default Drop Program and can only be used as the Drop Program. This program may also cause a Parallel Program to be launched and run simultaneously with the DROP PROGRAM.

RING PROGRAM

This program is used to define what actions to take to process an incoming call. In certain installations it may be desirable to have the Ring Program to perform differently on a per line basis. You now have the ability to assign any of the parallel programs as the Ring Program. Program 22 is the default Ring Program and can only be used as the Ring Program. The RING PROGRAM may cause a Parallel Program to be launched and run simultaneously with the RING PROGRAM.

PARALLEL PROGRAM

This program is used to define how the M-AXS will interact with the trunk (i.e. what to dial to the trunk and/or what to expect from the trunk). PARALLEL PROGRAMS, once launched by either a DROP or RING program, run simultaneously as the program that launched it. There can be up to 46 Parallel Programs, numbered 01-20 and 25-50. Programs 21 to 24 remain default programs for the Drop, Ring, Extension to Extension Calling and Call Home Programs.



The following is an example M-AXS Program, and 3 possible scenarios which use this programming.

EXAMPLE PROGRAM

Primary Table		Secondary Table	
1416	01	1???976	20
1800	04		
1905	01		
011	02		

Speed Dial		Bins	
01	14163651185 *#	01	3651000 *#
02	19053362450 *#	02	9876543 *#
03	0113347612345 *#	03	4531945 *#
		04	60274965 *#

Programs

01	6000 93 99 *#
02	64 01 50 08 97 64 02 50 08 97 6000 93 95 99 *#
04	64 03 50 08 97 64 04 50 08 97 81 01 03 6000 93 99 *#
RING	93 94 10 95 99 *#
DROP	90 92 75 700 99 *#

Scenario #1:

DROP PROGRAM

- a) User Picks up his phone (DROP Program is processed)
- b) 90 Go Off Hook to Trunk
- c) 92 Split Drop from Trunk
- d) 75 Provide Drop with Telco Dial Tone
- e) 700 Record Drop Dialed Digits; scan PRIMARY TABLE; upon a table match, Launch the appropriate PARALLEL Program; keep recording until an inter-digit time out.
- f) User Dials 1416
- g) Match Found in Primary table; PARALLEL Program 01 begins execution in parallel with the drop program.
- h) User continues Dialing digits until a complete phone number is entered (14163331111)
- i) After exceeding the inter-digit time out, then the 700 instruction is complete.
- j) 99 Wait for the Drop to hang up.

PARALLEL PROGRAM

(Launched by the DROP Program)

- a) 6000 Dial Drop Recorded Telephone Number (Wait for the 700 Instruction in the DROP program to complete, if required)
- b) 93 Join Trunk and Drop
- c) 99 Wait for Drop to Hang-Up

Scenario #2:**DROP PROGRAM**

- a) User Picks up his phone (DROP Program is processed)
- b) 90 Go Off Hook to Trunk
- c) 92 Split Drop from Trunk
- d) 75 Provide Drop with Telco Dial Tone
- e) 700 Record Drop Dialed Digits; scan PRIMARY TABLE; upon a table match, Launch the appropriate PARALLEL Program; keep recording until an inter-digit time out.
- f) User Dials 011
- g) Match Found in Primary table; PARALLEL Program # 02 begins execution in parallel with the drop program.
- h) User continues Dialing digits until a complete phone number is entered (0113353754864)
- i) After exceeding the inter-digit time out, then the 700 instruction is complete.
- j) 99 Wait for the Drop to hang up.

PARALLEL PROGRAM

(Launched by the DROP Program)

- a) 64 01 Dial Digits from BIN # 1 (Local Access Number), to the Trunk
- b) 5008 Wait up to 8 seconds for dial tone from the Trunk.
- c) 97 If dial tone is not present within 8 seconds give user reorder tone.
- d) 64 02 Dial Digits from BIN # 02 (Authorization Code), to the Trunk
- e) 50 08 Wait up to 8 seconds for dial tone from the Trunk.
- f) 97 If dial tone is not present within 8 seconds give user reorder tone.
- g) 81 01 03 Delete First 3 Digits from Drop Dialed Number .
(Number NOW is : 3353754864)
- h) 6000 Dial Drop Recorded Telephone Number (Wait for the 700 instruction in the
DROP program to complete, if required)
- i) 93 Join Trunk and Drop
- j) 99 Wait for Drop to Hang-Up

Scenario 3:**RING PROGRAM**

- a) Telco Trunk Begins to Ring
- b) 93 Join Trunk and Drop
- c) 94 10 Wait for Drop to Answer, or Auto Answer after 10 Rings
- d) 95 Watch for Program Mode String
- e) 99 Wait for Drop to Hang Up (Or Auto-Answer Time-Out)

The DROP program describes what happens when a user goes off hook; what actions to take, etc., and can launch a PARALLEL program. The PARALLEL program once started is executed simultaneously with the drop program. The purpose of the parallel program is to setup and describe the steps to be taken to route this telephone call to the appropriate destination. The same is true for the RING program as well.

ENTERING PROGRAM MODE

To enter program mode from a Touch Tone telephone you must;

- Go Off-Hook on the Drop Side Telephone or
- Answer an incoming call
- Enter the **Programming Mode** Access Code *****00*#**

Once the Access Code has been entered, the dialer will issue 2 beeps (“D” DTMF Tone Burst). If the dialer has been configured for a password, M-AXS will issue a third beep (“A” DTMF Tone Burst). You must now enter the password (1-8 digits), the M-AXS does not require you to enter the *# after the password has been entered. If the password is correct the dialer will issue 1 beep (“D” DTMF Tone Burst) and you have entered Program Mode. If the wrong password is entered, M-AXS will hang-up and gives Re-order Tone. The default program for the dialer is that there is no password required.

Upon successful entry into PROGRAM MODE you may now select any of the PROGRAM MODE Commands. M-AXS will issue 1 beep (“D” DTMF Tone Burst) after the successful completion of a programming mode command and return to programming mode awaiting the next command. If a mistake occurs while inputting a programming mode command, M-AXS will issue 2 beeps (“B” DTMF Tone Bursts) and return to programming mode awaiting the next command.

To Exit Program Mode;

- Enter the Exit Code ***#**

To enter programming mode via the M-AXS RS232 port using the *Zoo Keeper*[®] program

- “Double Click” the *Zoo Keeper*[®] icon in your Windows program
- Select “UPLOAD” from the Toolbar at top (The Program Mode screen will appear)
- Enter the **Programming Mode** Access Code *****00*#** or
- Click the ‘**Connect**’ icon

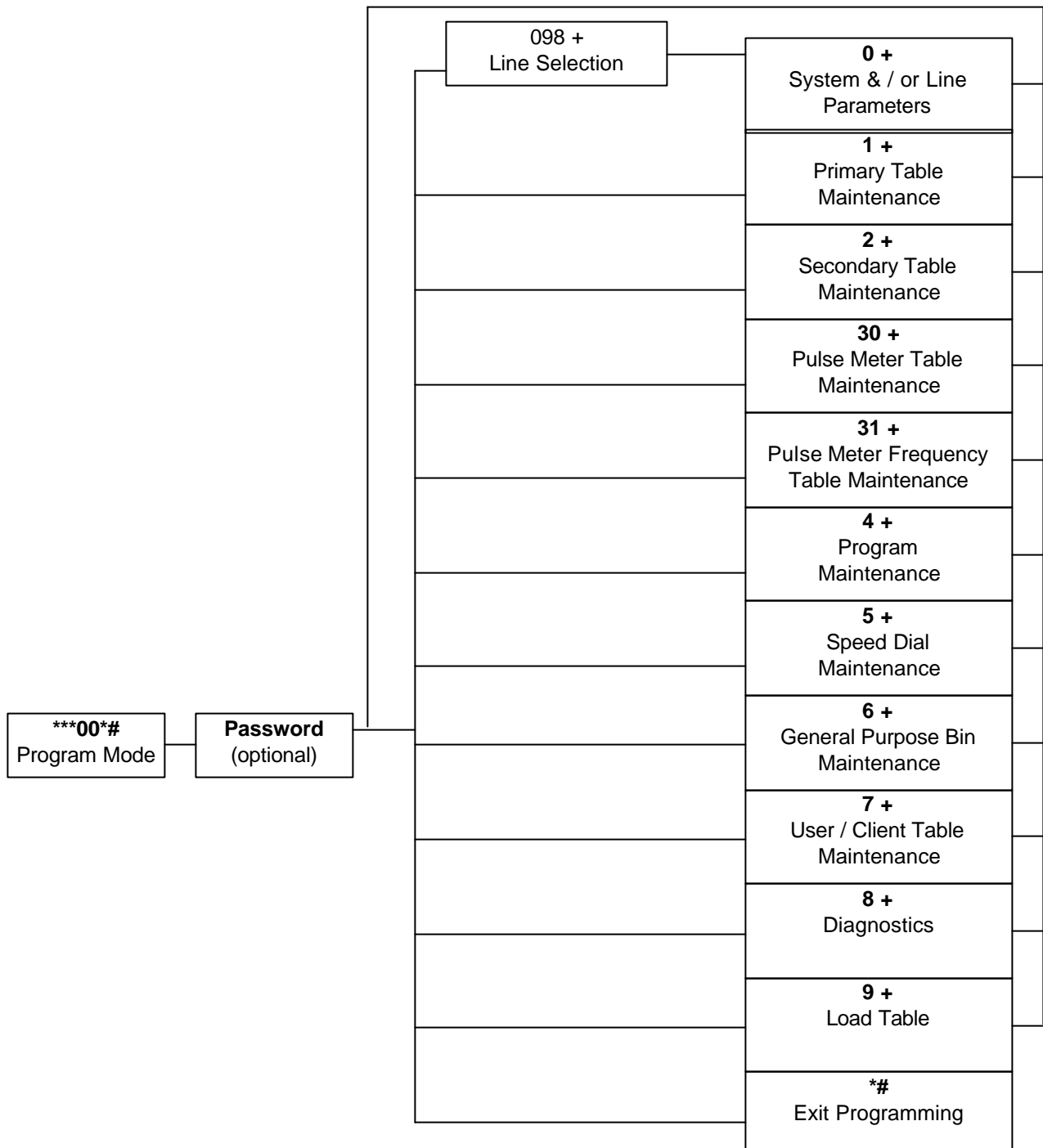
Once the Access Code has been entered the dialer will issue a confirmation and “OK” will appear on the upper half of the transmission window. If the dialer has been configured for a password, M-AXS will display on the screen “Enter Password”. You must now enter the password (1-8 digits). If the password is correct an “OK” will appear on the screen and you have entered Program Mode. If the wrong password is entered an “ERROR” message is displayed on the screen and the M-AXS exits you from Program Mode. The default program for the dialer is that there is no password required.

Upon successful entry into PROGRAM MODE you may now select any of the PROGRAM MODE Commands. If there are more than one Controllers configured as a Network, enter 097 followed by a 2 digit controller number 01-15 to select a particular controller. Entering 098 followed by a line number 1-8 will allow specific line parameters to be programmed. After every successful entry of a Program Mode command “OK” will appear on the screen and M-AXS returns to program mode awaiting the next command. If a mistake occurs while inputting a command, “ERROR” will appear on the screen and M-AXS returns to program mode awaiting the next command.

To Exit Program Mode;

- Enter the Exit Code ***#** or
- Click the ‘**Disconnect**’ icon

Note: The com port adapter used with the AXS will not work with M-AXS.



At this point, you may select any of the Program Mode commands. After successful completion of a Programming Mode command, M-AXS will issue a single beep (DTMF 'D' Tone) and will return to programming mode awaiting the next command. If a failure occurs in entering the password, M-AXS will hang up and give reorder tone.

SYSTEM WIDE PROGRAMMING PARAMETERS

When in programming mode, numerous system wide parameters are accessible.

DIALER ID

Code	000XX
Parameters	XX = ID of 01 to 99
Description	The Dialer ID is used to program a 2 digit number to identify the Dialer in a multiple Dialer installation. This code is output in the SMDR Record Default = 11

LEFT PORT BAUD RATE

Code	002X
Parameters	X = 1 - 1200 BPS X = 2 - 2400 BPS X = 3 - 9600 BPS X = 4 - 19200 BPS X = 5 - 38400 BPS
Description	Selects the baud rate at which both programming information, and SMDR Call Records are transferred via the left hand Serial Data Port. Default = 9600 BPS.

PROGRAM MODE TIME-OUT

Code	005XX
Parameters	XX = 05 to 99 Seconds
Description	When in programming mode, not via the local telephone set, but rather from a remote location, inactivity on the line (no DTMF Digits) for more than the specified time period will cause M-AXS to hang-up the line and disconnect.- "Error" appears on screen and the caller must sign back on. Default = 60 seconds.

FAILURE - RETRIES

Code	006XX
Parameters	XX = 00 to 10 Retries
Description	Upon failure of any of the Tone Detection Program Instructions (Such as Dial Tone), this parameter determines how many retries to attempt if the Tone Detection Failure instruction allows a retry. An entry of 00 will cause no retries, only the original attempt will be done. Default = 3 retries.

SELECT COUNTRY PARAMETERS

Code	007X
Parameters	X = Country Number
Description	This command selects the country that the M-AXS Dialer is installed in. This setting adjusts system parameters according to the Telephone Interface Requirement for Type Approval for the selected country.

SELECT SEARCH TABLE (FACTORY DEFAULT)

Code	008XX
Parameters	XX = 00 - 09 = Long Distance Store and Forward Applications X X= 10 - 19 = FAX P.A.D. Store and Forward Applications XX = 20 - 29 = International Call Back Applications XX = 30 - 39 = Intra-Lata Applications
Description	You may select any of a number of pre-set factory defaults that fully setup AXS for particular applications.

PASSWORD

Code	009XX
Parameters	XX = 1 to 8 digit password
Description	Entering a Password prevents unauthorized access to programming mode. Once a password has been entered, a person attempting to enter programming mode must enter the valid password before programming mode will be allowed. If a Password has been forgotten, contact Telcom Research to RESET to the Factory Default. Default = NONE

BIN ONLY PROGRAM PASSWORD

Code	010XX
Parameters	XX = 1 to 8 digit password
Description	Entering a password prevents unauthorized access to Bin Only Programming Mode. Once a password has been entered, a person attempting to enter Bin Only Programming Mode must enter the valid password before access to the General Purpose Bins programming mode will be allowed. Programming of the entire database is not allowed. If a Password has been forgotten, contact Telcom Research to RESET to the Factory Default. Default = NONE

SMDR / X.25 / NETWORKING OPTION

Code	011XXYYZZWW
Parameters	XX = Network Address - 00 - 15 (00 =- No Network) YY = Network Address of SMDR Port - 00 - 15 (00 =- No Network) ZZ = Network Address of Primary X.25 -00 - 15 (00 =- No Network) WW = Network Address of Secondary X.25 - 00 - 15 (00 =- No Network)
Description	Selects whether or not the dialer is networked with other dialers at the same site. Allows the selection of the SMDR Port, Primary and Secondary X.25 interface network addresses. If networking is not selected only the XX value of 00 is required. Default = 00

RIGHT PORT BAUD RATE

Code	012X
Parameters	X = 1 - 1200 BPS X = 2 - 2400 BPS X = 3 - 9600 BPS X = 4 - 19200 BPS X = 5 - 38400 BPS
Description	Selects the baud rate at which the X.25 data packet is transferred via the X.25 Data Port Default = 9600 BPS

CALL HOME MODE (VERSION 1.46 AND ABOVE)

Code	013XY
Parameters	X = 0 No Call Home X = 1 Call Home on Call Home Day at midnight X = 2 Call Home on Call Home Day within Call Home Hour, at Call Home Minute X = 3 Call Home at Random Time on Call Home Day X = 4 Call Home on Call Home Day randomly within Call Home Hour Y = 1 Call Home within 10 minutes after power up, after first phone call Y = 0 No Call Home after power up.
Description	This parameter allows for the modification of the Call Home program timing. The first variable allows the programmer to determine when the Call Home Program will be executed once the Call Home Day occurs. This day is determined by the parameter 015DDHHMM. The second variable allows the programmer to set the dialer to Call Home automatically within 10 minutes after each power up, after the first phone call has been placed from the attached telephone. Default = 00 – No Call Home

CALL HOME MODE (VERSION 1.45 AND BELOW)

Code	013XY
Parameters	X = 0 No Call Home X = 1 Call Home on Call Home Day at midnight X = 2 Call Home on Call Home Day randomly within Call Home Hour X = 3 Call Home at Random Time on Call Home Day Y = 1 Call Home within 10 minutes after power up, after first phone call Y = 0 No Call Home after power up.
Description	This parameter allows for the modification of the Call Home program timing. The first variable allows the programmer to determine when the Call Home Program will be executed once the Call Home Day occurs. This day is determined by the parameter 015DDHH. The second variable allows the programmer to set the dialer to Call Home automatically within 10 minutes after each power up, after the first phone call has been placed from the attached telephone. Default = 00 – No Call Home

DAYS LEFT

Code	014XX
Parameters	X X= 00 – 99 Days
Description	This parameter displays the number of days left before the next Call Home Day. This parameter counts down the number of days set with the 015XXYY parameter. The number of days can be changed so that scheduling of updates can be done. Once this parameter reaches 00 the Call Home Program will execute and the number of Days Left will be reset to the XX value of parameter 015. Default = 00

AUTOMATIC CALL HOME

Code	015DDHHMM
Parameters	DD = Number of days between calls for updates (00 - 99) HH = Hour of day to call home (00 - 23) MM = Minute of Hour to call home (00-59)
Description	This instruction will allow for the dialers to automatically 'call home' to have its tables updated for the purpose of least cost routing. The 'home' location must have the ability to automatically answer the incoming call, recognize the calling dialers ID and download an updated database . The dialer uses program 24 for 'calling home'. Default = 00 Days, 00 Hour

CALL HOME FAILURE RETRIES

Code	017X
Parameters	X = 1 – 9 Retries
Description	This parameter determines the number of attempts that will be made to complete the Call Home Program, if it fails. The time between attempts is determined by parameter 018XX. Default = 5

CALL HOME RETRIES INTERVAL

Code	018XX
Parameters	X = 01 – 99 Minutes
Description	This parameter determines the time between attempts that will be made to complete the Call Home Program, if it fails. Default = 10 Minutes

DTMF OUTPUT LEVEL

Code 025XX
Parameters XX = 01 to 15
Description This instruction will allow for the dialers normal DTMF output level to be adjusted.
Default = 10

DTMF BOOST LEVEL

Code 028XX
Parameters XX = 01 to 15
Description This instruction will allow for the dialers DTMF boost level to be adjusted.
Default = 15

RELEASE/RESEIZE TIME

Code 032XX
Parameters XX = 01 to 99 (X 50 Milliseconds)
Description When any instruction is executed that will result in the Trunk Side of M-AXS to go to the OFF-HOOK state, this timer determines if the off hook condition can happen immediately, or not. If a previous instruction had just placed the M-AXS in the ON-HOOK state, then the instruction to go OFF-HOOK might violate this Release/Reseize time. If this should occur, the program will delay execution until this timer is satisfied.
Default = 1000 Milliseconds.

RING DETECT SENSITIVITY

Code 034X
Parameters X = 0 to 9 (0 is Most Sensitive)
Description Detection of ringing is governed by this setting. In a very noisy environment, voltage spikes on the phone line might be interpreted as ringing. Decreasing the sensitivity would avoid false detection of noise.
Default = 5

IGNORE RING HIGH FREQUENCY LIMIT

Code 035X
Parameters X=1 ON (True) or 0 OFF (False)
Description Normally the ring detector of the M-AXS will recognize ringing in the 14-90Hz range. Setting this parameter to 1 removes the upper frequency limit.
Default = 1 on (True)

RING DETECT CADENCE

Code 036X
Parameters X = 1 to 9 seconds
Description This parameter allows adjustment of the time that M-AXS will wait at the end of one ring signal for the beginning of the next ring signal, or the call is answered, before the dialer decides that there is no longer a call coming into the dialer.
Default = 6

GENERATED DIAL TONE FREQUENCY

Code 044XXXXYYYY
Parameters XXXX = 0100 - 2499 Low Frequency (HZ)
YYYY = 0100 - 2499 High Frequency (HZ)
Description M-AXS can generate a Dial Tone (See instruction 76). This instruction allows you to define the frequency components of this tone.
Default = Low - 350 Hz
High - 440 Hz

GENERATED CALL PROGRESS TONE FREQUENCY

Code 045XXXXXXXXX
 Parameters XXXX = 0100 - 2499 Low Frequency (HZ)
 YYYYY = 0100 - 2499 High Frequency (HZ)
 Description M-AXS can generate a Call Progress Tone (See instruction 83). This instruction allows you to define the frequency components of this tone.
 Default = Low - 660 Hz
 High - 860 Hz

GENERATED BEEP TONE FREQUENCY

Code 046XXXXXXXXX
 Parameters XXXX = 0100 - 2499 Low Frequency (HZ)
 YYYYY = 0100 - 2499 High Frequency (HZ)
 Description M-AXS can generate a Beep (See instruction 77X and 79X). This instruction allows you to define the frequency components of this beep.
 Default = Low - 1000 Hz
 High - 1000 Hz

RING DETECT TONE FREQUENCY

Code 047XXYY
 Parameters XX = 12 - 29 Low Frequency (HZ)
 YY = 30 99 High Frequency (HZ)
 Description This parameter allows for the adjustment of the high and low frequencies of the incoming ringing tone where the dialer is to be installed.
 Default = 1490

OFF HOOK RECOGNITION

Code 050XX
 Parameters XX = 00 to 99 (X 10 Milliseconds)
 Description When the Drop Side telephone goes off hook, it must remain off hook and in a stable state for the amount of time specified by this parameter, in order for it to be recognized as an OFF-HOOK condition by M-AXS.
 Default = 60 Milliseconds.

DIGIT REFUSAL TIMER

Code 051XX
 Parameters XX = 00 to 99 (X 10 Milliseconds)
 Description After the Off Hook timer above has been satisfied, this timer must also be satisfied before either DTMF or Pulse digits will be accepted from the Drop Side Telephone.
 Default = 50 Milliseconds.

INTER-DIGIT TIME OUT - FIRST DIGIT

Code 053XX
 Parameters XX = 05 to 99 Seconds
 Description When the Drop Side telephone goes off hook, this timer determines how long the user can delay dialing the first digit before M-AXS executes it's next instruction.
 Default = 20 Seconds

INTER-DIGIT TIME OUT - NOT-FIRST DIGIT

Code 054XX
 Parameters XX = 02 to 99 Seconds
 Description When the Drop Side telephone goes off hook, and begins Dialing, this timer determines how long the user can delay between digits, before M-AXS executes it's next instruction.
 Default = 5 Seconds.

ON HOOK RECOGNITION

Code	055XX
Parameters	XX = 00 to 99 (X 20 Milliseconds)
Description	When the Drop Side telephone goes on hook, it must remain on hook and in a stable state for the amount of time specified by this parameter, in order for it to be recognized as an ON-HOOK condition by M-AXS. Default = 400 Milliseconds.

USER/CLIENT FIRST DIGIT TIME-OUT

Code	056XX
Parameters	XX = 02 to 99 seconds
Description	When the program requests either a User Code, or Client Code, this timer determines how long the user can wait to dial the first digit, before M-AXS will execute the next instruction. Default = 10 Seconds.

SPEED DIAL ACCESS CODE

Code	060X
Parameters	X = Single digits Access Code
Description	Access to speed dial is done by the user Dialing this Access Code followed by a two digit number in the range of 01 to 99. For example to redial speed dial number 15 (assuming the default code of #), the user would go off hook, and dial #15. By placing an "A","B","C","D" as the code you can effectively disable this feature, since normal telephones do not have these digits. Default = #

OVERRIDE CODE

Code	061XY
Parameters	X = Single Digit Override Code Y = Centrex Compatibility 1=Disable, 0 = Enable
Description	After a user goes off hook, if the first digit Dialed is the Override code, then the second digit Dialed is used as the parallel program number to run in the range of 1 to 9, 0=10). When override has been activated by the user and Centrex compatibility is enabled, parameter "Y" determines if Centrex compatibility is disabled for the remainder of this call. For example, a person going off hook and Dialing *5 14165551212 will cause M-AXS to automatically use program 5 instead of the program that might have been used as a result of a table search. This feature gives the user the ability to force a specific routing for a specific call. By placing an "A","B","C","D" as the code you can effectively disable this feature, since normal telephones do not have these digits. If Centrex is enabled, and the "Y" parameter is set to "1", then after the *5, the user is not required to enter the Centrex Access Code. However, program 5 must explicitly include a 10XXYY command to dial the Centrex Access Code. You cannot use the "63" command. Default = *1

END DESTINATION NUMBER DIGIT

Code	062X
Parameters	X= 0-9,A,B,C,D,#,*
Description	This entry is used to terminate digit collection before a timeout. Once dialed, the digit is discarded. Default = #

SPEED DIAL PROGRAMMING PREFIX

Code 063XX
 Parameters XX=2 Digit Access Code
 Description Allows a two digit access code that enables users to program speed dial bins. To disable feature, set to *5,*5 which sets code to A.A.
 Default = #*

NEW CALL SCANNING

Code 064XX
 Parameters XX= 1 or 2 digits
 Description If the digit programmed here is seen while not collecting digits, a call record will be dumped and a new one started. Some callback switches have the ability to allow the user to place a second call simply by dialling a digit.
 Default = #

SET DATE

Code 070DDMMYY
 Parameters DD = Day (01 to 31)
 MM = Month (01 to 12)
 YY = Year (00 to 99)
 Description M-AXS maintains a Real Time Clock for SMDR Records. This option simply sets the current date in the form of YYMMDD. For example to enter June 15 1996 you would enter: 070150696.

SET TIME

Code 071HHMMSS
 Parameters HH = Hours (00 to 23)
 MM = Minutes (00 to 59)
 SS = Seconds (00 to 59)
 Description M-AXS maintains a Real Time Clock for SMDR Records. This option simply sets the current time in the form of HHMMSS. For example to enter 10:45:20 (AM) you would enter:071104520

X.25 KEEP ALIVE SCRIPT INTERVAL

Code 079XXXXX
 Parameters X = 00000 – 99999 Seconds
 Description This instruction will allow for the dialers X.25 Keep Alive Script interval to be adjusted.
 Default = 00000 Seconds.

PULSE METER FREQUENCY

Code 080X
 Parameters X = 0 - 12,000 Hz.
 X = 1 - 16,000 Hz
 Description This instruction will allow for the dialers pulse meter frequency to be adjusted.
 Default = 16000 Hz.

PULSE METER SURCHARGE PAUSE

Code 081XX
 Parameters XX = 05 - 99 (x 10 ms)
 Description This instruction will allow adjustment of the delay before the surcharge is sent.
 Default = 200 ms.

PULSE METER DURATION

Code 082XX
Parameters XX = 05 - 99 (x 10 milliseconds)
Description This instruction will allow for the dialers to pulse meter duration to be adjusted.
Default = 100 ms.

AUDIO PORT OUTPUT LEVEL

Code 083XX
Parameters XX = 01 - 11
Description This instruction will allow for the dialers audio port level to be adjusted. This will adjust the level of the audio signal played to the user when it has been supplied to the dialer through the audio port .
Default = 01

PULSE METER EXTENDED PAUSE

Code 084X
Parameters X = 1 On X = 0 Off
Description This parameter allows for the addition of a pause in the pulse meter frequency table. The pause is executed after the pulse meter surcharge and before the regular pulse meter interval of pauses is activated. In the pulse meter frequency table the pause is entered as a three digit number from 000 to 999 seconds.
Default = 0

JOIN COMMAND OVERLAP

Code 093X
Parameters X = 0 – 9 (x 10 milliseconds)
Description This instruction will allow for the dialers join command timing to be adjusted. This will adjust the time that the M-AXS will use to switch from the split to joined condition.
Default = 20 ms.

LINE SELECTION FOR PROGRAMMING

Code 098X
Parameters X = Line Number 1 to 8 0 = All Lines
Description This instruction will allow for lines to be programmed individually. This allows fine tuning of individual line parameters without affecting other lines on the unit.
Default = 0

DATA CONFIRMATION MODE

Code 099X
Parameters X = 1 Data Confirmation Mode on
x = 0 Data Confirmation Mode off
Description This mode will allow a programmer to retrieve the system parameter settings of a remote dialer. Each parameter must be retrieved individually.
Default = 0

LINE SPECIFIC PARAMETERS**SMDR ON/OFF**

Code 001X
 Parameters X = 0 - Off
 X = 1 - All Calls
 X = 2 - Outgoing Only
 Description Controls the generation of SMDR Call Records.
 Default = 0 - Off

IDLE STATE

Code 003X
 Parameters X = 0 - Trunk and Drop Split
 X = 1 - Trunk and Drop Joined
 Description This parameter selects the default idle state of AXS when the Drop telephone is on hook, no ringing signal is present, and no program is executing. Joined means that the Trunk Side Tip and Ring is physically connected to the Drop Side Tip and Ring. Split means that the Trunk and Drop are not connected, and that the Drop telephone is connected to an internal source for talk battery and Dial Tone.
 Default = 1 - Trunk and Drop Joined.

DIALING TYPE (OUTGOING CALL)

Code 021X
 Parameters X = 1 - DTMF
 X = 2 - Pulse
 Description M-AXS can dial using either DTMF Tones or Dial Pulse. This parameter selects the initial method for M-AXS to dial digits towards the Trunk. You may however switch from DTMF to Pulse, or Pulse to DTMF with Program Instructions 20 and 21 while executing a program.
 Default = 1 - DTMF.

PULSE DIALING SPEED

Code 023X
 Parameters X = 1 - 10 PPS - 60/40 On/Off Percent
 X = 2 - 20 PPS - 60/40 On/Off Percent
 X = 3 - 10 PPS - 67/33 On/Off Percent
 X = 4 - 20 PPS - 67/33 On/Off Percent
 Description M-AXS can dial towards the Trunk at either 10 or 20 pulses per second, with either a 60/40 or 67/33 percent break/make ratio.
 Default = 1 - 10pps.60/40 on/off

PULSE INTER-DIGIT TIME

Code 024XX
 Parameters XX = 04 to 99 (X 50 Milliseconds)
 Description When pulse Dialing has been selected, this parameter controls the inter-digit time. That is the delay between completion of pulsing out one digit, and beginning to pulse out the next digit. Possible times are in the range of 50 MS to 4.95 seconds.
 Default = 500 milliseconds.

DTMF DIALING SPEED (ON TIME)

Code 026XX
 Parameters XX = 04 to 99 (X 10 Milliseconds)
 Description DTMF Dialing TONE ON Time can be set to any duration from 40 MS to 990 MS. Along with DTMF Inter-Digit Time, this parameter allows any combination of DTMF Dialing speed desired.
 Default = 60 Milliseconds.

DTMF INTER-DIGIT TIME (OFF TIME)

Code 027XX
 Parameters XX = 04 to 99 (X 10 Milliseconds)
 Description DTMF Dialing TONE OFF Time can be set to any speed from 40 MS to 990 MS. Along with DTMF Dialing Speed, this parameter allows any combination of DTMF Dialing speed desired.
 Default = 60 Milliseconds.

DIAL SHUNT

Code 029XXYY
 Parameters XX = 00 to 99 (X 10 Milliseconds) Predial
 YY = 00 to 99 (X 10 Milliseconds) Post Dial
 Description Allows the setting of the Pre-dial and Post-Dial shunt.
 Default = 0000 Milliseconds.

DIAL TONE FREQUENCY

Code 040XXXXYYYYZZ
 Parameters XXXX = 0100 - 2499 Low Frequency (HZ)
 YYYY = 0100 - 2499 High Frequency (HZ)
 ZZ = 05 - 75 Tolerance (Percent)
 Description M-AXS allows you to define all of the parameters required to detect dial tone. Since dial tone is not uniform around the world, or even around the country, this insures compatibility. For standard North American Dial Tone program as follows 0440; and the tolerance to 08
 Default = Low: - 350 Hz
 High - 440 Hz
 Tolerance - 8%.

RING BACK FREQUENCY

Code 041XXXXYYYYZZ
 Parameters XXXX = 0100 - 2499 Low Frequency (HZ)
 YYYY = 0100 - 2499 High Frequency (HZ)
 ZZ = 05 - 75 Tolerance (Percent)
 Description M-AXS allows you to define all of the parameters required to detect Ring Back. Since Ring Back tone is not uniform around the world, or even around the country, this insures compatibility. For standard North American Ring Back Tone program as follows
 Default = Low - 440 Hz
 High - 480 Hz
 Tolerance - 8%

BUSY FREQUENCY

Code 042XXXXYYYYZZ
 Parameters XXXX = 0100 - 2499 Low Frequency (HZ)
 YYYY = 0100 - 2499 High Frequency (HZ)
 ZZ = 05 - 75 Tolerance (Percent)
 Description M-AXS allows you to define all of the parameters required to detect Busy Tone. Since Busy tone is not uniform around the world, or even around the country, this insures compatibility. For standard North American Busy Tone program as follows
 Default = Low - 480 Hz
 High - 620 Hz
 Tolerance - 8%

TONE BURST FREQUENCY

Code	043XXXXYYYYZZ
Parameters	XXXX = 0100 - 2499 Low Frequency (HZ) YYYY = 0100 - 2499 High Frequency (HZ) ZZ = 05 - 75 Tolerance (Percent)
Description	M-AXS allows you to define all of the parameters required to detect a Tone burst. This feature may be used if M-AXS is required to detect some form of confirmation tone, such as 1000 HZ. For a single frequency tone, set both the HIGH and LOW frequencies to the same frequency, and the tolerance about 08. For complex tones such as a DTMF digit, contact Telcom Research for appropriate settings. Default = Low - 1450 Hz High - 1450 Hz Tolerance -1 2%

TONE CADENCE 1

Code	048XXXXYYYYZZAABCCDD
Parameters	XXXX = Low Frequency (HZ) YYYY = High Frequency (HZ) ZZ = Tolerance (Percent) AA = Cadence A On Time (x 100 ms) BB = Cadence A Off Time (x 100ms) CC = Cadence B On Time (x 100 ms) DD = Cadence B Off Time (x 100ms)
Description	M-AXS allows you to define two On and Off Times (Cadence) required to detect a tone. This feature may be used to detect telephone network tones, such as Busy Tone or Congestion Tone. Default = Low - 0480 Hz, High - 0620 Hz, Tolerance -8% Cadence A On Time – 01 (100 ms) Cadence A Off Time – 02 (200 ms) Cadence B On Time – 03 (300 ms) Cadence B Off Time – 04 (400 ms)

TONE CADENCE 2

Code	049XXXXYYYYZZAABCCDD
Parameters	XXXX = Low Frequency (HZ) YYYY = High Frequency (HZ) ZZ = Tolerance (Percent) AA = Cadence A On Time (x 100 ms) BB = Cadence A Off Time (x 100ms) CC = Cadence B On Time (x 100 ms) DD = Cadence B Off Time (x 100ms)
Description	M-AXS allows you to define two On and Off Times (Cadence) required to detect a tone. This feature may be used to detect telephone network tones, such as Busy Tone or Congestion Tone. Default = Low - 0480 Hz, High - 0620 Hz, Tolerance -8% Cadence A On Time – 01 (100 ms) Cadence A Off Time – 02 (200 ms) Cadence B On Time – 03 (300 ms) Cadence B Off Time – 04 (400 ms)

DIALING TYPE (INCOMING RECOGNITION)

Code	052X
Parameters	X = 0 - DTMF or PULSE X = 1 - DTMF Only X = 2 - PULSE ONLY
Description	Dialing Type selects what type of Dialing that M-AXS will recognize from the Drop Side telephone. 2 enables pulse recognition only, and any DTMF digits present will not be recognized. 1 enables DTMF recognition only, and any pulse digits present will not be recognized. 0 allows M-AXS to accept either DTMF or Pulse digits. Default = 0 - DTMF or Pulse

CENTREX/PBX COMPATIBILITY

Code 0650X
Parameters X = 0 - 6 Extension Number Length
Description Compatibility with Centrex/PBX systems that require ACCESS CODES can be accomplished using this feature. Entering 06504 means that you are activating Centrex/PBX compatibility, and that extension to extension calls have 4 digits. Entering 06500 means that Centrex/PBX compatibility has been turned off.
Default = 0 - Compatability Off.

The dialer comes preprogrammed with Program 23, which is used for extension to extension calls when compatability is turned on. It is imperative that the 600X command in the dial string have the same number entered as the X value in the compatability code above.

CENTREX ACCESS CODE

Code 065XYY
Parameters X = Code # (1 to 5)
YY = Access Code (YY may be 1 or 2 Digits)
Description For Centrex/PBX compatibility, M-AXS can be programmed with up to 5 ACCESS Codes per
Default = None.

SELECT DROP PROGRAM NUMBER

Code 066YY
Parameters YY = Program Number
Description In certain installations it may be desirable to program the Drop Program to perform differently on a per line basis. You now have the ability to assign any of the parallel programs as the Drop Program. Program 22 to 24 can not be used as the Drop Program.
Default = 21 - All Lines

SELECT RING PROGRAM NUMBER

Code 067YY
Parameters YY = Program Number
Description In certain installations it may be desirable to program the Ring Program to perform differently on a per line basis. You now have the ability to assign any of the parallel programs as the Ring Program. Program 21, 23 and 24 can not be used as the Ring Program.
Default = 22 - All Lines

DROP/RING/PARALLEL PROGRAM INSTRUCTIONS

Programs are what make M-AXS perform all of its tasks. With the correct set of programs, M-AXS can redirect outgoing calls, redirect incoming calls, monitor call traffic or almost any other telecommunications control function. Programs are made up of strings of instructions. This section contains Drop/Ring/Parallel program code instruction descriptions.

NO-OPERATION

Code	00
Parameters	NONE
Description	This instruction does nothing. It is typically used after one of the tone detection instructions (Eg: 50) which skip the following instruction upon success. If no special action is required, on failure, you need to have a "DO NOTHING" instruction.

SILENCE TO DROP

Code	01
Parameters	NONE
Description	This instruction removes any audio tones that are being provided to the Drop. These include Dial Tone and Call Progress Tones.

SEND SMDR RECORD NOW

Code	05
Parameters	NONE
Description	This instruction sends the SMDR record out the RS232 port when it executes. This instruction can be placed anywhere in a program string and be used to aid in call tracking.

DIAL DIGITS TOWARDS DROP

Code	07XXYY
Parameters	XX = number of digits to dial YY = digits to dial
Description	When MAXS is required to dial digits towards the Drop, such as the positive call answer to the Euro Display, this instruction is used. For example the instruction 0702** is interpreted by MAXS as dial a * towards the Drop. Version 800149 and later.

The following are allowed digits in a 07 instruction:

0 to 9, A, B, C, D and #	Dial Digit
*5	DTMF Digit "A" if no "A" can be generated.
*6	DTMF Digit "B" if no "B" can be generated.
*7	DTMF Digit "C" if no "C" can be generated.
*8	DTMF Digit "D" if no "D" can be generated.
**	Dial the "*" Digit

AUTOMATIC BIN CHANGE

Code	08WWXXYYZ
Parameters	WW = Number of Digits to Expect XX = Bin Number to Change YY = Time to Wait for First Digit Z = Time to Wait for Subsequent Digits
Description	This instruction allows General Purpose Bins to be changed automatically within a program string. This will give service providers the ability to change bins that contain authorization numbers thus increasing the security of their service from fraudulent use. The instruction will change the number contained in the bin but will not provide any error checking to be sure that the received number is the one that the switch sent. However, the bin is changed as soon as the number has been sent so that you can have the bin sent back to the switch for verification.

DIAL DIGITS

Code	10XXYYYY
Parameters	XX = Number of Digits to dial YY = Digits to Dial
Description	The following are allowed digits in a 10 instruction: 0 to 9, A, B, C, D and # Dial Digit *5 DTMF Digit "A" if no "A" can be generated. *6 DTMF Digit "B" if no "B" can be generated. *7 DTMF Digit "C" if no "C" can be generated. *8 DTMF Digit "D" if no "D" can be generated. ** Dial the "*" Digit

DETECT TIP AND RING REVERSAL ON TRUNK SIDE (STOP METERING)

Code	19
Parameters	None
Description	This instruction is placed in the program string after the 93 join command and before the 99, wait for hang up. It will monitor the trunk line for a tip and ring reversal after a phone call has been completed so that the pulse metering can be stopped. It will wait for the reversal indefinitely. If there is no reversal on the trunk once the call has been completed and the far end hangs up the metering will be stopped when the M-AXS end user hangs up the call. For this feature to operate, the M-AXS <u>must</u> have 137 or higher firmware and the correct hardware version of the cartridge must be installed.

SWITCH TO TONE DIALING

Code	20
Parameters	NONE
Description	This instruction will make the M-AXS use DTMF Tone Dialing from this point on during this call. This command could be used, if M-AXS is setup to dial Pulse, due to the customer having Pulse Lines. After dialing into a PBX or Computer, M-AXS would be required to switch to DTMF in order to signal properly. (See Instruction 21 below as well)

SWITCH TO PULSE DIALING

Code	21
Parameters	NONE
Description	This instruction will make the M-AXS use Dial Pulse Dialing from this point on during this call. (See Instruction 20 above for more detail).

CHANGE DTMF DIAL SPEED

Code	22XXYY
Parameters	XX = 04-99 X 10 ms DTMF On Time YY = 04-99 X 10 ms DTMF Off Time
Description	This allows the DTMF On Time and DTMF Off Time to be changed in a program string. The dialing speed can be adjusted as many times as required in a program or programs. When the telephone is placed on hook the time set by parameters 026 and 027 will be used for any subsequent calls until a 22XXYY command is executed. Version 800149 and later.

DTMF BOOST

Code	25X
Parameters	X = 0 Standard DTMF Level X = 1 DTMF High Output Level
Description	This instruction allows the DTMF output level to be increased for purposes of communicating with a remote device. When M-AXS begins to dial, it will be using the standard DTMF output level, but after Dialing is complete and M-AXS is attempting to communicate with a REMOTE system, then an increased DTMF level may be required. The value of the boosted level is set with the system wide parameter 028XX.

DISPLAY PER CALL INFORMATION

Code	29X
Parameters	X = 0 to send the information DTMF X = 1 to send the information serially
Description	This program instruction sends the per call parameters to be send to the Euro Display. If X is set to 0 then the packet is sent to the display in DTMF tones. If X is set to 1 then the information is sent through a serial command. Version 800149 and later.

CALCULATE CHECKSUM

Code	30
Parameters	None
Description	This program instruction is used to calculate the checksum value. All the digits dialed after the 30 instruction are used in the checksum calculation. It is calculated by summing the values of each character and taking the total modulo 100. The digits 0-9 have the value of 1-10, the * has the value of 11 and the # a value of 12. The digit A has a value of 13, B has a value of 14, C has a value of 15 and D has a value of 0.

DIAL CHECKSUM TO THE LINE

Code	31
Parameters	NONE
Description	This program instruction is used to dial the checksum value to the line.

GO TO X.25 SCRIPT**

Code	32VWXYZZZZ
Parameters	V = 1 for Primary X.25, 2 for Secondary X.25 provider W = Script to run 1, 2 or 3. XX = Time in seconds to wait for a RETURN instruction to be executed in script. Y = Number of 2 digit arguments to follow ZZZZ = An argument to the X.25 used by the SENDARG instruction Values for ZZZZ are as follows 01 through 20 = General Purpose Bins of same number 60 = Destination Number 61 = User Code 62 = Client Code 63 = Dialer Id 64 = Line Number 1-8 65 = Spare Code 1 66 = Spare Code 2 67 = Current Program 68 = M-AXS Network Address 69 = 4 Digit SMDR Record Number 70 = SMDR Call Record
Description	When entered into a program string this instruction allows the X.25 script to be executed. If the RETURN value is 1 from the X.25 script the next instruction is skipped. If no RETURN instruction is executed in the script, the RETURN value defaults to 0 and the following instruction will be executed.

AFTER HANGUP GOTO PROGRAM XX

Code	34XX
Parameters	XX = 00 - 50
Description	If XX is not 00 then Continue After Hang up is activated. When the user hangs up program XX is executed. If XX is 00 then Continue After Hang up is deactivated and no program is executed at hang up.

GO TO PROGRAM XX

Code	35XX
Parameters	XX = 01 - 50
Description	When executing a program it may become necessary to jump to a different program. For example, instruction 3505 is interpreted by M-AXS as stop execution of the current PARALLEL program and begin execution of program 5.

HANG UP, LOOP BACK AND RESTART PROGRAM

Code	36
Parameters	NONE
Description	Upon execution of instruction 36, M-AXS will stop executing the current program, hang-up the Trunk Side Line, and re-execute the same program. This would occur for a maximum of X retries, with X being the Failure Retry count as specified by system parameter 006XX.

GO TO FUNCTION PROGRAM XX

Code	37XX
Parameters	XX = 01 - 50
Description	When executing a program it may be desirable to jump to a different program to execute a common function such as tone cadence detection. For example, instruction 3705 is interpreted by M-AXS as jump to and begin execution of program 5. This instruction works in conjunction with the instruction 38X which after execution of the function program sends the call back to the original program.

RETURN TO ORIGINAL PROGRAM

Code	38X
Parameters	X = 0 (do not skip next instruction when returned to the original program) X = 1 (skip next instruction when returned to the original program)
Description	After executing the function program entering a 38X instruction will send the call back to the original program at the spot where the 37XX instruction sent the call to the function program. Once returned to the original program the next instruction may be skipped or executed depending on the value programmed for X.

DETECTED TONE DURATION

Code	39XX
Parameters	XX = 00-99 x 20 milliseconds
Description	It will allow the programmer to set the length of time, from 20 ms to 2 seconds in 20 ms increments, a tone that is being detected, (Dial Tone, Busy Tone, Tone Burst), must be present on the line to be considered the proper tone. It is placed in the string before the detect instruction. The detect instruction operates the same way as before with a 'what if it fails' instruction required after it. If you do not add a 39XX instruction or entered 3900 then the default detection timing method is used. An example of the use of this instruction is as follows 6401 3950 5015 97 – this requires 1 second of dial tone to be present within 15 seconds.

VERIFY USER CODE**

Code	40XX
Parameters	XX = Security Level
Description	A previously recorded User Code (See Instruction 71XX) can be verified for security. For example the instruction 4005 will cause the User table to be searched for a match of User Code. If a match is found, the match must have a security level of 5 or greater for the instruction to be successful. If this instruction is successful (A table match with a greater than or equal to security level), then the next instruction is skipped.

VERIFY CLIENT CODE**

Code	41XX
Parameters	XX = Security Level
Description	A previously recorded Client Code (See Instruction 72XX) can be verified for security. For example the instruction 4005 will cause the Client table to be searched for a match of Client Code. If a match is found, the match must have a security level of 5 or greater for the instruction to be successful. If this instruction is successful (A table match with a greater than or equal to security level), then the next instruction is skipped.

WAIT FOR USER

Code	45
Parameters	None
Description	This instruction when used in a Parallel Program will cause the Parallel Program to wait for a user time out. Since the Parallel Program is triggered by a match in the Primary Table of user Dialed digits, and the Drop program and Parallel program run independent of each other. There are times when you may wish the Parallel Program to wait until the Drop Program has finished recording digits. This instruction will wait for a timeout by the user from any of the record digit instructions (70X, 71 and 72).

DETECT TIP AND RING REVERSAL ON TRUNK SIDE (START METERING) **

Code	48XX
Parameters	XX = Seconds to Wait (01 to 99)
Description	Adding the 48 Instruction to your program will provide the ability to detect a tip and ring reversal so that pulse metering can be started for billing purposes. The 2 digit XX specifies how long to wait for the reversal to take place. This instruction could be added to the program string either before or after the 93 join command. Upon successful detection of the reversal the next instruction in the program will be skipped. This allows you to determine the action upon failure. For this feature to operate, the M-AXS <u>must</u> have 137 or higher firmware and the correct hardware version of the cartridge must be installed.

DETECT METER PULSE ON TRUNK SIDE **

Code	49XY
Parameters	X=0 for 12kHz, 1 for 16kHz, YY = Seconds to Wait (01 to 99)
Description	This instruction will allow the programmer to set the length of time, from 01 seconds to 99 seconds, that it will wait to detect the pulse. This detect instruction operates the same way as all the other detect instructions in that it requires a 'what if it fails' instruction after it. This instruction only works while the dialer is in join mode and will not work if the dialer is in split mode. It <u>must</u> be placed in the string after the join instruction, 93. This will allow users to detect the meter pulse as an indication that a call has been answered so that the SMDR record can be started at the proper time. (On TBR21 cartridges only)

DETECT DIAL TONE ON TRUNK SIDE **

Code 50XX
Parameters XX = Seconds to Wait (01 to 99)
Description Before Dialing a phone number, you may wish to verify that dial tone is present. Adding the 50 Instruction to your program will do just that. The 2 digit XX specifies how long to wait for dial tone if it is not immediately present.
Upon successful detection of tone the next instruction in the program will be skipped. This allows you to determine the action upon failure.
The frequency of the dial tone this instruction is trying to detect is set by the line parameter 040XXXXYYYYZZ, set Dial Tone Frequency.

DETECT DTMF DIGIT ON TRUNK SIDE **

Code 51XXY
Parameters X = Digit to Detect
YY = Seconds to Wait (01 to 99)
Description When interacting with PBX's or Computers, M-AXS may be required to detect DTMF digits and respond to them. This 51 instruction does this. It will wait for YY seconds for the digit X. Upon successful detection of the tone the next instruction in the program will be skipped. This allows you to determine the action upon failure. For example, a 97 instruction following this instruction would hang up and give re-order tone, while a 36 instruction would hang up and restart the program. If you wish to continue regardless, simply place a 00 instruction (NO-OPERATION) following this instruction.
Note: M-AXS contains only one DTMF receiver, so if this instruction is in a parallel program you must make sure that an instruction in either the RING or DROP program is not also using the DTMF receiver. Which ever instruction is executed last will take control of the DTMF receiver, and the other instruction may be delayed.

DETECT TONE BURST ON TRUNK SIDE **

Code 52XX
Parameters XX = Seconds to Wait (01 to 99)
Description When interacting with PBX's or Computers, M-AXS may be required to detect a TONE and respond to it. The 52 instruction does this. It will wait for XX seconds for the tone.
Upon successful detection of tone the next instruction in the program will be skipped. This allows you to determine the action upon failure. For example, a 97 instruction following this instruction would hang up and give re-order tone, while a 36 instruction would hang up and restart the program. If you wish to continue regardless, simply place a 00 instruction (NO-OPERATION) following this instruction. The frequency of the tone must first have been set in the system parameters (See Tone Burst Frequency 043).
The frequency of the tone this instruction is trying to detect is set by the line parameter 043XXXXYYYYZZ, set Tone Burst Frequency.

DETECT BUSY TONE ON TRUNK SIDE **

Code 53XX
Parameters XX = Seconds to Wait (01 to 99)
Description The command operates in the same manner as instruction 52 above.
The frequency of the busy tone this instruction is trying to detect is set by the line parameter 042XXXXYYYYZZ, set Busy Tone Frequency.

WAIT FOR HOST **

Code 55XX
Parameters XX = Seconds to Wait (01 to 99)
Description This command is used only in the Call Home Program, 24. This instruction monitors the line for the programming mode code ***00*#.

DETECT TONE CADENCE **

Code	56XY
Parameters	X = 1 (Detect Tone 1 Cadence defined with parameter 048) X = 2 (Detect Tone 2 Cadence defined with parameter 049) YY = Seconds to Wait (01 to 99)
Description	This instruction will wait to detect Tone Cadence 1 or 2 for YY seconds. If either the 'A' or 'B' cadence requirements are met, the next instruction is skipped. If the On time is met for 'A' then the instruction will only check for the Off time of 'A' and ignore the Off time for 'B'. If either of the 'A' or 'B' cadence settings in parameters 048 or 049 are 0 then that cadence is not checked (disabled).

DETECT RING BACK TONE ON TRUNK SIDE**

Code	57XXYY
Parameters	XX = Seconds to Wait (01 to 99) YY = # of Rings to Wait For
Description	The command operates in a manner similar to instruction 52 above, with the additional feature, that you can program using YY the number of rings to wait for. The frequency of the ring back tone this instruction is trying to detect is set by the line parameter 041XXXXYYYYZZ, set Ring Back Tone frequency.

WAIT FOR CALL BACK**

Code	58XX
Parameters	XX = Seconds to wait for a Call Back
Description	When implementing International Call Back using M-AXS, you must use this instruction in the Parallel Program. Your parallel program should include instructions to dial the Call Back Switch, Wait for 1 Ring, Hang-Up and then execute this instruction. This instruction will cause the Parallel program to HALT for XX seconds waiting for a call back. If a call back does not come within XX seconds then the next instruction is executed. If a call back is received, execution will continue after skipping the next instruction. In this way you can control what is done upon success or failure.

DELAY

Code	59XX
Parameters	XX = 01 to 99 (X 100 Milliseconds)
Description	If a FIXED delay is required, use the 59 instruction. For example, 5950 will cause the program to halt for 5.0 seconds before it executes the next instruction.

DIAL DROP RECORDED TELEPHONE NUMBER TO TRUNK

Code	60XX
Parameters	XX - Maximum Digits to Dial (01 to 99)
Description	This instruction is used in a PARALLEL program usually to dial to a PBX or Computer, the destination telephone number Dialed by the user. The digits that 60 dials must first have been collected with one of the 70X instructions (See Below) from the Drop Program. When the parallel program executes this instruction it will dial any digits that the user has dialed up to this point. Since the Drop Program may still be executing its 70X instruction, the parallel program will wait at this instruction for digits to dial until one of three things happen; the drop hangs up; the drop reaches an inter-digit timeout in which case the number is assumed to be complete, or the XX number of digits has been input by the user and Dialed by this instruction in which case the number is again assumed to be complete. The XX Maximum Digits is intended to be used to eliminate the inter-digit time. If XX is set to 00, then this instruction will not continue until an interdigit time out has occurred (no maximum digits).

DIAL DROP RECORDED USER CODE TO TRUNK

Code	61
Parameters	None
Description	Dial the user code (recorded with the 71XX instruction) to the trunk side.

DIAL DROP RECORDED CLIENT CODE TO TRUNK

Code	62
Parameters	None
Description	Dial the client code (recorded with the 72XX instruction) to the trunk side.

DIAL DROP RECORDED CENTREX ACCESS CODE

Code	63
Parameters	None
Description	The 63 command when placed in a parallel program on a system with centrex enabled, will dial the access code dialed by the user. For instance if the user dials 9 followed by a phone number, M-AXS will detect that 9 is the Centrex Access Code, and store it. Once a match has been found in a search table, and a parallel program executes the 63 instruction, the "9" (that was stored) will be dialed.

DIAL DIGITS IN BIN # XX TO TRUNK

Code	64XX
Parameters	XX - Bin Number
Description	When a program is required to dial a local access phone number, or authorization code, it may be easier to place these numbers into one of the General Purpose Number Bins. If the number has been placed into bin 01 to 10 the same number will be dialed each time this bin is entered into a parallel program. If the number has been programmed into bin 11 to 20, using the per line programming feature (098X), the number dialed each time this bin is entered into a parallel program would depend on which line the call is being placed on. Using this technique, all lines could execute the same program, and each individual line could have a unique authorization code programmed. For example 6401 will dial the digits contained in bin 01 and 6411 would dial the digits contained in bin 11 of each line.

DIAL RECORDED SPARE CODE 1 TO TRUNK

Code	65
Parameters	None
Description	Dial the Spare Code 1 (recorded with the 73XX instruction) to the trunk side.

DIAL RECORDED SPARE CODE 2 TO TRUNK

Code	66
Parameters	None
Description	Dial the Spare Code 2 (recorded with the 74XX instruction) to the trunk side.

DIAL HOOK FLASH ON TRUNK SIDE

Code	68XX
Parameters	XX = Flash Length (X 100 Milliseconds)
Description	The 68XX instruction will generate a HOOK FLASH towards the TRUNK with a duration of from 100MS to 9.9 Seconds.

DIAL SPEED DIAL

Code	69XX
Parameters	XX = Speed Dial Bin Number (01 to 99)
Description	This instruction will cause M-AXS to dial a Speed Dial Bin number in the same manner that it dials a General Purpose Number Bin. For example 6955 would dial the digits in Speed Dial Bin 55.

RECORD DROP DIALED DIGITS, SEARCH PRIMARY TABLE

Code	700
Parameters	NONE
Description	This command is used in the Drop or Ring Program. When executed it clears out any digits in the input buffer, and begins recording the user Dialed digits. This command will continue recording digits until either the user hangs up, or an inter-digit timeout occurs. As the user dials digits, the Primary Search table is searched for an exact match. If a match is found, then a parallel program will begin execution in PARALLEL with the Drop or Ring Program. The input buffer is 250 digits in length, however table searches are limited to the first 15 digits, since search tables have a maximum entry length of 15 digits.

RECORD DIALED DIGITS, SEARCH PRIMARY AND SECONDARY TABLE.

Code	701
Parameters	NONE
Description	This command is used in the DROP or RING Program. When executed it clears out any digits in the input buffer, and begins recording the user Dialed digits. This command will continue recording digits until either the user hangs up, or an inter-digit timeout occurs. As the user dials digits, the Primary and Secondary Search table is searched for an exact match. The Secondary Table is searched only after a match has been found in the Primary table. If a match is found, then a parallel program will begin execution in PARALLEL with the Drop or Ring Program. The input buffer is 250 digits in length, however search table searched are limited to the first 15 digits, since search tables have a maximum entry length of 15 digits.

RECORD DIALED DIGITS

Code	702
Parameters	NONE
Description	This command is used in the Drop or Ring Program. When executed it clears out any digits in the input buffer, and begins recording the user Dialed digits to a maximum of 250. This command will continue recording digits until either the user hangs up, or an inter-digit timeout occurs. No table searching is done.

SEARCH PRIMARY TABLE WITH ENTERED DIGITS

Code	703
Parameters	NONE
Description	This command is used in the Drop or Ring Program. When executed the Primary Table is searched for a match on digits previously entered using the 702 command above. If an exact match is found, then a parallel program will begin execution in PARALLEL with the Drop or Ring Program.

SEARCH PRIMARY AND SECONDARY TABLE WITH ENTERED DIGITS

Code	704
Parameters	NONE
Description	This command is used in the Drop or Ring Program. When executed the Primary and Secondary Tables are searched for a match on digits previously entered using the 702 command above. The Secondary Table is searched only after a match has been found in the Primary table. If an exact match is found, then a parallel program will begin execution in PARALLEL with the Drop or Ring Program.

RECORD DIALED USER CODE**

Code	71XX
Parameters	XX = Number of Digits to record 00 = Record up to a maximum of 20 digits while waiting for a time out. 01 to 20 = Record 1 to 20 digits
Description	This instruction accepts from the user a User Code of XX digits in length for playback at a later time (See instruction 61). If the user enters the correct number of digits, the instruction has been successful and will skip the following instruction. If less than the required digits are entered and a timeout occurs, the following instruction is executed. If "XX" is "00" (Zero Zero), then the command will wait for up to 20 digits or a time out .

RECORD DIALED CLIENT CODE**

Code	72XX
Parameters	XX = Number of Digits to record 00 = Record up to a maximum of 20 digits while waiting for a time out. 01 to 20 = Record 1 to 20 digits
Description	This instruction accepts from the user a Client Code of XX digits in length for playback at a later time (See instruction 62). If the user enters the correct number of digits, the instruction has been successful and will skip the following instruction. If less than the required digits are entered and a timeout occurs, the following instruction is executed. If "XX" is "00", then the command will wait for up to 20 digits or a time out .

RECORD DIALED SPARE CODE 1**

Code	73XX
Parameters	XX = Number of Digits to record 00 = Record up to a maximum of 20 digits while waiting for a time out. 01 to 20 = Record 1 to 20 digits
Description	This instruction accepts from the user the Spare Code 1 of XX digits in length for playback at a later time (See instruction 65). If the user enters the correct number of digits, the instruction has been successful and will skip the following instruction. If less than the required digits are entered and a timeout occurs, the following instruction is executed. If "XX" is "00", then the command will wait for up to 20 digits or a time out .

RECORD DIALED SPARE CODE 2**

Code	74XX
Parameters	XX = Number of Digits to record 00 = Record up to a maximum of 20 digits while waiting for a time out. 01 to 20 = Record 1 to 20 digits
Description	This instruction accepts from the user the Spare Code 2 of XX digits in length for playback at a later time (See instruction 66). If the user enters the correct number of digits, the instruction has been successful and will skip the following instruction. If less than the required digits are entered and a timeout occurs, the following instruction is executed. If "XX" is "00", then the command will wait for up to 20 digits or a time out .

PROVIDE TELCO TONES TO DROP (USUALLY DIAL TONE)

Code	75
Parameters	NONE
Description	<p>This command is used in the DROP Program usually to provide the user with Dial Tone. The typical scenario is as follows. When the User goes off hook, he is split from the Trunk Line. M-AXS goes off hook to the Trunk. M-AXS will have pulled up dial tone and so when the 75 instruction is executed, it actually connects the signal present on the trunk (Dial Tone at this point) to the Drop Set, so the user hears dial tone. Any signal transmitted by the user does not however get to the trunk side. After the user dials the first digit of the phone number the Trunk Signal is disconnected from the Drop Side.</p> <p>This command allows the user to hear actual Telephone Company dial tone when dialing. This is useful for areas where dial tone is not Precise, or where the phone company may provide stutter dial tone to indicate activation of a feature on the Trunk..</p>

M-AXS GENERATED DIAL TONE TO DROP

Code	76
Parameters	NONE
Description	<p>This command is used in the DROP Program and causes M-AXS to generate Precise Dial Tone to the Drop Telephone. The frequency of this dial tone is set by per line parameter 044XXXXYYYY, Generated Dial Tone Frequency.</p>

BEEP DROP SIDE

Code	77X
Parameters	X - Number of Beeps
Description	<p>This command will cause X beeps to be sent to the Drop Telephone. This instruction is useful for letting the user know of a completed instruction such as Dialing. The frequency of this beep tone is set by per line parameter 046XXXXYYYY, Generated Beep Tone Frequency.</p>

M-AXS GENERATED DIAL TONE TO TRUNK SIDE

Code	78
Parameters	NONE
Description	<p>This command is used in the RING Program and causes M-AXS to generate Precise Dial Tone to the Trunk after answering an incoming call. The frequency of this dial tone is set by per line parameter 044XXXXYYYY, Generated Dial Tone Frequency.</p>

BEEP TO TRUNK

Code	79X
Parameters	X - Number of Beeps
Description	<p>This command is used in the RING Program and causes M-AXS to generate BEEPS towards a caller. The frequency of this beep tone is set by per line parameter 046XXXXYYYY, Generated Beep Tone Frequency.</p>

AUDIO SOURCE TO THE DROP

Code	80
Parameters	NONE
Description	<p>At times it may be desirable to provide a message to the user to let him/her know that things are progressing normally. This can be done by connecting an audiosource to the M-AXS through the RJ12 Auxiliary Jack. The level of this source is set by System Parameter 083XX Audio Port Output Level.</p>

DELETE DIGITS FROM DIALED STRING

Code	81XXYY
Parameters	XX = Start Position YY = Number of Digits to Delete
Description	Certain applications require the modification of the user Dialed digits. For example M-AXS may be programmed to redirect all international calls to a local PBX for alternate routing. In this case, the number dialed by the user might be 011-33-4567890. The PBX may only require the actual phone number, not the 011. The command 810103 will transform 011-33-4567890 into 33-4567890. As a side effect, in the example, since we are modifying the first 3 digits, the instruction will wait until there are at least 3 digits in the input buffer recorded from the user.

INSERT DIGITS INTO USERS DIALED STRING

Code	82XXYYZZ
Parameters	XX = Start Position YY = Number of Digits to Insert ZZ = Digit(s) to Insert
Description	Certain applications may require the modification of a user Dialed digit. The instruction 8201011 would convert 800-555-1212 to 1-800-555-1212 As a side effect, the instruction will wait until there are at least XX digits in the input buffer recorded from the user.

CALL PROGRESS TONE TO THE DROP

Code	83
Parameters	NONE
Description	At times it may be desirable to provide a CALL PROGRESS tone to the user to let him/her know that things are progressing normally. The frequency of this beep tone is set by per line parameter 045XXXXYYYY, Generated Call Progress Tone Frequency.

INCREMENT CALL PEG BIN

Code	84XXY
Parameters	XX = Bin Number 01-20 Y = 1 – Increment Peg Count Only Y = 2 – Increment Timer Only Y = 3 – Increment Peg Count and Timer Y = 4 – Stop Timer (execution of 99 will automatically stop the timer) Enhanced Call Peg Counter available Version 800143 and later.

TEST DAY OF WEEK**

Code	85 XY
Parameters	X = Start Day Y = Stop Day. 1 = Monday, 2 = Tuesday, 3 = Wednesday, 4 = Thursday, 5 = Friday, 6 = Saturday, 7 = Sunday
Description	Adding this instruction to a program will cause the program to skip the next instruction if the day is greater than or equal to the start day and less than or equal to the stop day, otherwise the next instruction is executed.

TIP AND RING REVERSAL

Code	86X
Parameters	X = 1 Line Reversal X = 0 Normal
Description	At times it may be desirable to provide Tip and Ring Reversal to trigger call accounting systems. This can be done by placing a 861 instruction in the program string when the reversal is required to start the call accounting. If required the 860 instruction can be placed in the program string to put the line back to it's original polarity.

SET DATE AND TIME**

Code	87
Parameters	NONE
Description	This instruction will allow for the dialers date and time to updated remotely so as to insure accurate SMDR records as well as routing according to the time of day. The instruction waits for any digit collection to finish and then monitors the trunk for DTMF tones until an interdigit timeout occurs. The equipment that is now connected to the dialer must have the ability to DTMF the date and time in the form of DDMMYYHHMM. Upon receiving this DTMF string the program will skip the next instruction, otherwise the next instruction is executed.

TEST TIME OF DAY**

Code	88 HHMMhhmm
Parameters	HHMM = Start Time hhmm = Stop Time.
Description	Adding this instruction to a program will cause the program to skip the next instruction if the time is greater than or equal to the start time and less than or equal to the stop time, otherwise the next instruction is executed.

CONTINUE AFTER HANG UP

Code	89X
Parameters	x = 1 dialer programs continue to run after hang up. x = 0 programs do not continue after hang up.
Description	Adding this instruction to a program will allow the program to continue to execute after the drop phone hangs up. The dialers Release / Reseize Timer (032) must be adjusted to 50 ms. and the On Hook Recognition Timer (055) must be adjusted to 60 ms.

OFF-HOOK TRUNK SIDE

Code	90
Parameters	NONE
Description	Execution of this command will cause the Trunk Circuit to go to the OFF Hook state. This command is required before any instruction that will send tones etc. to the telephone company.

ON-HOOK TRUNK SIDE

Code	91
Parameters	NONE
Description	Execution of this command will cause the Trunk Circuit to go to the ON Hook state.

SPLIT TRUNK AND DROP

Code	92
Parameters	NONE
Description	Execution of this instruction will SPLIT the Trunk and Drop Circuits. The Drop Circuit is provided with a local battery feed of -24V DC.

JOIN TRUNK AND DROP

Code	93
Parameters	NONE
Description	This instruction will JOIN the Trunk and Drop Circuits. When executed, the Tip and Ring of the Trunk are physically connected to the Tip and Ring of the Drop.

WAIT FOR ANSWER

Code	9400
Parameters	NONE
Description	This instruction would be placed in the RING program to instruct m_AXS to wait for the user to answer the ringing line. If no ringing signal is present for duration programmed with instruction 36, Ring Cadence Off Time, then the ringing line is assumed to have stopped ringing and the program quits executing.

WAIT FOR ANSWER OR AUTO-ANSWER

Code	94XX
Parameters	XX - Number of Rings
Description	With 94XX in the RING program, M-AXS will wait for the user to answer a ringing line or after XX rings will automatically answer the ringing line and wait for Wake-Up instructions. This command is recommended so that unattended access to M-AXS for programming is possible.

START SMDR RECORD

Code	95
Parameters	NONE
Description	Normally an SMDR record is started upon a Search Table Match. If a program does not use the facility of searching tables, then an SMDR record is never started. You can manually start a record by executing instruction 95. Another reason might be a complex program that even though starts a record at a search table match, may not connect for several seconds, and so you can manually RE-START the SMDR record closer to the actual connection.

PREVENT SMDR RECORD

Code	96
Parameters	NONE
Description	If no SMDR record is desired for a particular program (For Example Local Calls), then by placing the 96 command near the end of the parallel program (but before the 99 command) will prevent M-AXS from generating a record for the call.

HANG-UP AND RE-ORDER

Code	97
Parameters	NONE
Description	Execution of instruction 97 will terminate ALL running programs and release the Trunk Line (Go ON-HOOK). If the Drop Telephone is off hook, this instruction will provide the user RE-ORDER tone until they hang up.

HANG-UP AND CLEANUP

Code	98
Parameters	NONE
Description	Execution of instruction 98 will terminate ALL running programs and place M-AXS in the idle state waiting for the user to go off hook or the phone line to ring. If all programs have stopped running, a 98 instruction will be executed automatically by M-AXS.

WAIT FOR HANG-UP BY USER OR TIME OUT - NO PULSE METERING

Code 99
Parameters NONE
Description The action of the 99 instruction is dependant upon the program in which it is executed. If the instruction is in the DROP program, or a PARALLEL program triggered from a DROP program, then execution of the 99 instruction waits for an ON-HOOK condition of the DROPTelephone before executing the next instruction. If the instruction is in the RING program, or a PARALLEL program triggered from a RING program, then execution of the 99 instruction waits for a user time out, such as INTER-DIGIT, or INITIAL-DIGIT.

WAIT FOR HANG-UP BY USER - PULSE METERING

Code 09
Parameters NONE
Description The action of the 09 instruction is dependant upon the program in which it is executed. If the instruction is in the DROP program, or a PARALLEL program triggered from a DROP program, then execution of the 09 instruction waits for an ON-HOOK condition of the DROP Telephone before executing the next instruction. Pulse metering for the purpose of call accounting will be activated.

**** REQUIRES FAILURE INSTRUCTION**

PROGRAM MAINTENANCE

Upon entering programming mode, you may select any of a number of features/options to add, edit, or modify. The following is a list of these and how they are used.

SYSTEM PARAMETERS

Code	0XXYY *#
Parameters	XX = System Option (See Appendix "B") YY= Setting
Description	Entering a "0" (ZERO) followed by a System Option number and that options parameters, provides the ability to change any of the system options. For example, Pulse Dialing speed is parameter 23, and a 1 sets 10 PPS and a 2 sets 20 PPS. Entering 0 23 1 *# Sets Pulse Dialing Speed to 10 PPS (*# is equivalent to the ENTER Key). Refer to Appendix "B" for a list of all of the System Parameters.

PRIMARY TABLE MAINTENANCE

Code	1XXAA *#
Parameters	XX = Digits to enter into Table AA = Action
Description	Entering a "1" followed by a string of digits, provides maintenance of the Primary Search Table. For example entering 1 1416555 03 *# will add 1416555 to the Primary Search Table, with an Action Code of 03 (execute Program 3). Entering 1 1416555 00 *# will remove the entry 1416555 from the Primary Table if it exists. Wild Card Entries = ? Each time a new entry is made to a table, the entire table is first searched to ensure the number does not already exist. If it exists, it is replaced with the new entry.

SECONDARY TABLE MAINTENANCE

Code	2XXAA *#
Parameters	XX = Digits to enter into Table AA = Action
Description	Entering a "2" followed by a string of digits, provides maintenance of the Secondary Search Table. For example entering 2 1900 20 *# will add 1900 to the Secondary Search Table, with an Action Code of 20 (Execute Program 20). Entering 2 1900 00 *# will remove the entry 1900 from the Secondary Table if it exists. Wild Card Entries = ? Each time a new entry is made to a table, the entire table is first searched to ensure the number does not already exist. If it exists, it is first deleted, and then replaced with the new entry.

PULSE METER TABLE MAINTENANCE

Code	30XXAA *#
Parameters	XX = Digits to enter into Table AA = 01 - 99 (Entry number of Pulse Meter Frequency / Surcharge Table)
Description	Entering a "30" followed by a string of digits, provides maintenance of the Pulse Meter Search Table. For example entering 30 0065 16 *# will add 0065 to the Pulse Meter Search Table, with an Action Code of 16 (Use entry 16 of the Meter Frequency / Surcharge Table). Entering 30 0065 00 *# will remove the entry from the Table if it exists. Wild Card Entries = ?

Each time a new entry is made to a table, the entire table is first searched to ensure the number does not already exist. If it exists, it is first deleted, and then replaced with the new entry.

PULSE METER FREQUENCY / SURCHARGE TABLE MAINTENANCE

Code	31XXYYAAAZZZZZ *#
Parameters	XX = Table Entry Number (01 - 99) YY = Number of Surcharge Pulses (01 - 99) ZZZZZ = Pulse Meter Frequency (x 10ms) AAA = Extended Pause Time (This is present only if Extended Pause has been activated)
Description	Entering a "31" followed by 9 digits, provides maintenance of the Pulse Meter Frequency Surcharge Table. For example entering 31 16 05 00333 *# will add to entry 16 of the Pulse Meter Frequency Table a pulse meter Surcharge of 5 pulses at cut through and 1 pulse every 3.33seconds. A Duration of 00000 is now a valid entry. If the Duration is set to 00000 there will be no meter pulses generated and sent out by the MAXS after the surcharge pulses have been sent. This could be used if a meter pulse is required to start a billing program but they are not required after that. Version 800145 or later

PROGRAM MAINTENANCE

Code	4PPXX *#
Parameters	PP = Program Number 01 to 20, 25 to 50 for Parallel Programs 21 for Drop Program 22 for Ring Program 23 for Extension to Extension Program 24 for Call Home Program XX = Program STRING (See Appendix "D")
Description	All M-AXS functions are controlled through programs. When the Drop Side telephone goes off hook, the Drop Program begins execution. When an incoming ring is detected, the Ring Program begins execution.

By entering a "4" followed by a 2 digit program number, followed by program instructions (See Appendix "D") you can enter programs. For example to program the Ring Program to simply JOIN the Trunk and DROP side together when the Trunk rings you would do the following: 4 22 93 9400 99 *#

This example can be decoded as follows:

```

4 22   - Enter instructions into program 22 (Ring Program)
93     - Join Trunk and Drop
9400   - Wait for the Drop to answer the telephone.
99     - Wait for the Drop to hang Up.
*#     - ENTER Key terminates the input.

```

This procedure is repeated to place instructions into the various programs.

SPEED DIAL MAINTENANCE

Code	5SSXX *#
Parameters	SS = Speed Dial # (01 to 99) XX = Speed Dial STRING *# = Denotes END of SPEED DIAL STRING
Description	M-AXS allows up to 99 speed dial numbers to be entered. These speed dial numbers are triggered by a user dialing the Speed Dial Access Code followed by the two digit bin number. Once triggered, the speed dial number replaces the users Dialed number, and a search of the Primary Table begins . As a result of this search, a match would be found, and the speed dial number would be dialed as if the user had actually dialed it themselves.

BIN MAINTENANCE

Code	6BBXX *#
Parameters	BB = Bin Number (01 to 20) XX = Bin Dial STRING
Description	M-AXS contains 20 General Purpose Number Bins. These Number Bins are generally used for storage of Local Access Telephone Numbers, or Authorization Codes. A General Purpose Number Bin can be inserted into any of the Programs to cause that program to dial the digits contained in the bin. Bins 01 to 10 are global bins while bins 11 to 20 can be programmed differently for each line.

To program a global bin, simply enter "6" followed by the two digit bin number (01 to 10), followed by the digits to be Dialed, followed by *# (Enter Key).

Eg: **6 01 5551212 *#** will place 5551212 into bin 01

To program line specific bins, enter the Line Selection for Programming code, 098, followed by the line number, followed by *# (Enter Key). Enter "6" followed by the two digit bin number (11 to 20), followed by the digits to be Dialed, followed by *# (Enter Key).

Eg: 0981*# **6 11 3361487 *#** will place 3361487 into bin 11 of line 1
 0982*# **6 11 3369876 *#** will place 3369876 into bin 11 of line 2
 0980*# **6 12 56789 *#** will place 56789 into bin 12 of all lines

General Purpose Bin Only Programming. This will allow programming access only to the General Purpose Bins that are used to store the DID numbers, Local Node Numbers and / or Pin Numbers for Callback or Fax Store and Forward. The entire program can not be accessed through this code. The code is ****0*#.

A system parameter has been added in junction with the above that will allow you to program a Bin Only Programming Password. The Password is independent of any programming access code that you may have programmed into the system.

USER TABLE MAINTENANCE

Code	71XXSS *#
Parameters	XX = User Code (1 to 15 Digits in length) SS = Security Level (01 to 99)
Description	Entering a "71" followed by a string of digits, provides maintenance of the User Code Table. For example entering 71 1234 03 *# will add 1234 with a security level of 03 to the User Table. Entering 71 1234 00 *# will remove the User 1234 from the Table if it exists.

Each time a new entry is made to a table, the entire table is first searched to ensure the number does not already exist. If it exists, it is first deleted, and then replaced with the new entry.

CLIENT TABLE MAINTENANCE

Code	72XXSS *#
Parameters	XX = Client Code (1 to 15 Digits in length) SS = Security Level (01 to 99)
Description	Entering a "72" followed by a string of digits, provides maintenance of the Client Code Table. For example entering 72 1234 03 *# will add 1234 with a security level of 03 to the Client Table. Entering 72 1234 00 *# will remove the Client 1234 from the Table if it exists.

Each time a new entry is made to a table, the entire table is first searched to ensure the number does not already exist. If it exists, it is first deleted, and then replaced with the new entry.

DIAGNOSTICS

Code	8XX *#
Parameters	XX - Maintenance Command
Description	M-AXS can playback all of its programming using DTMF to either the Drop or Trunk Side, which ever is in control of programming mode.

LOAD

Code	9X *#
Parameters	X - Table to Load
Description	M-AXS can Clear and Load its search tables all in one step. Refer to Load Commands for more detail.

REMOTE RESET

Code	020XX*#
Parameters	X X = 00 to remotely reset the dialer to Factory Default.
Description	Entering 02000*# is the same as performing a "*" power up reset.

DIAGNOSTIC COMMANDS**PLAY/DISPLAY VERSION NUMBER**

Code	80
Parameters	NONE
Description	Entering "80" will cause M-AXS to play/display its Firmware Version Number.

PLAY/DISPLAY PROGRAM

Code	81XX
Parameters	XX = 00 - ALL Programs XX = 01 to 50 - Individual Program
Description	Entering "81" followed by a two digit number will cause M-AXS to play /display the desired program. For example, 8133 will cause M-AXS to play /display Program 33. This is used for verification of programming.

PLAY/DISPLAY ALL OF THE PRIMARY TABLE

Code	820
Parameters	NONE
Description	Entering "820" will cause AXS to play/display ALL entries in the Primary Search Table. This is used for verification of the Primary Table.

PLAY/DISPLAY PRIMARY TABLE

Code	821XXYY
Parameters	XX = Range with Length >= YY = Range with Length <=
Description	Entering "8210103" will cause M-AXS to play/display all table entries from 1 to 3 digits in length. Entering "8210404" will cause M-AXS to play only entries of 4 digits in length. This is used for verification of the Primary Table.

PLAY/DISPLAY ALL OF THE SECONDARY TABLE

Code	822
Parameters	NONE
Description	Entering "822" will cause M-AXS to play/display, using DTMF, ALL entries in the Secondary Search Table. This is used for verification of the Secondary Table.

PLAY/DISPLAY SECONDARY TABLE

Code	823XXYY
Parameters	XX = Range with Length >= YY = Range with Length <=
Description	Entering "8230103" will cause M-AXS to play/display all table entries from 1 to 3 digits in length. Entering "8230404" will cause M-AXS to play/display only entries of 4 digits in length. This is used for verification of the Secondary Table.

PLAY/DISPLAY ALL OF THE PULSE METER SEARCH TABLE

Code	824
Parameters	NONE
Description	Entering "824" will cause M-AXS to play/display ALL entries in the Pulse Meter Search Table. This is used for verification of the Pulse Meter Search Table.

PLAY/DISPLAY PULSE METER FREQUENCY / SURCHARGE TABLE

Code	32XX
Parameters	XX = 00 - All Entries XX = 01 - 99 - Specific Entry
Description	Entering "3200" will cause M-AXS to play/display all the table entries. Entering "3204" will cause M-AXS to play/display the entry 04. This is used for verification of the Pulse Meter Frequency / Surcharge Table.

PLAY/DISPLAY ALL OF THE USER TABLE

Code	826
Parameters	NONE
Description	Entering "826" will cause M-AXS to play/display ALL entries in the User Table. This is used for verification of the Table.

PLAY/DISPLAY USER TABLE

Code	827XXYY
Parameters	XX = Range with Length >= YY = Range with Length <=
Description	Entering "8270405" will cause M-AXS to play/display all table entries from 4 to 5 digits in length. Entering "8270404" will cause M-AXS to play/display only entries of 4 digits in length. This is used for verification of the Table.

PLAY/DISPLAY ALL OF THE CLIENT TABLE

Code	828
Parameters	NONE
Description	Entering "828" will cause M-AXS to play/display ALL entries in the Client Table. This is used for verification of the Table.

PLAY/DISPLAY CLIENT TABLE

Code	829XXYY
Parameters	XX = Range with Length >= YY = Range with Length <=
Description	Entering "8290405" will cause M-AXS to play/display all table entries from 4 to 5 digits in length. Entering "8290404" will cause M-AXS to play/display only entries of 4 digits in length. This is used for verification of the Table.

PLAY/DISPLAY SPEED DIAL BIN

Code	83XX
Parameters	XX = 00 - ALL Bins XX = 01 to 99 for individual bin
Description	Entering "83" followed by the two digit bin number will cause M-AXS to play/display the digits contained in the selected bin. Entering "8300" will cause M-AXS to play/display ALL of the bins.

PLAY / DISPLAY GENERAL PURPOSE BINS

Code	84XX
Parameters	XX = 00 - ALL Bins XX = 01 to 20 for individual bin
Description	Entering "84" followed by the two digit bin number will cause M-AXS to play/display the digits contained in the selected bin. If the two digit bin number selected is 11 to 20, the digits contained in the selected bin will be displayed on a per line basis. Entering "8400" will cause M-AXS to play/display ALL of the bins. If there have been bins (11 to 20) programmed for use by specific lines, the bin number, followed by the line number, followed by the digits contained in the bin will be displayed. If 098X is entered to select a specific line and is followed by 8400 it will display all the bins associated with the line, including any global number bins. If a line has been selected and 84XX is then entered, the only bin displayed is XX for the line.

DISPLAY ALL SYSTEM PARAMETERS TO THE DATA PORT

Code	85
Parameters	NONE
Description	Entering 85 will cause M-AXS to dump the entire list of System Wide and Per Line Parameters, of installed Line Cartridges, out to the Programming Com Port. To display the parameters for only one line, enter the Line Selection for Programming code, 098, followed by the line number, followed by *# (Enter Key). Enter "85", followed by *# (Enter Key). This will cause M-AXS to dump the parameters of only the specified line out to the Programming Com Port. The Line Parameters can be displayed individually whether or not a Line Cartridge is installed. This output is ASCII at the baud rate set for the port.

CLEAR PROGRAM

Code	86XX
Parameters	XX = 00 - ALL Programs XX = 01 to 50 for Parallel Program
Description	You may clear any or all of the 50 programs. Entering "8600" will erase ALL programs while "8603" for example will erase only program 3. Erasure of a program is not essential since programming over top of it will overwrite the old program, and unless a program is executed by either a match in a search table, or from another program it has no affect.

CLEAR TABLE

Code	87X
Parameters	X = 0 - Primary Table X = 1 - Secondary Table X = 2 - Pulse Meter Search Table X = 3 - User Table X = 4 - Client Table
Description	You may clear out any or all of the 5 Tables (Primary, Secondary, Pulse Meter, User, Client). Entering "870" will erase ALL of the Primary Table; "871" will erase ALL of the Secondary Table, and "872" will erase ALL of the Pulse Meter Search Table. (See also Clear and Load below (90, 91, 92)

CLEAR SPEED DIAL BIN

Code	88XX
Parameters	XX = 01 to 99 for Bin Number, 00 for ALL
Description	You may clear any or all of the Speed Dial Numbers. By entering 8800 you will erase ALL bins, while 8803 will erase only bin 3

CLEAR GENERAL PURPOSE BIN

Code	89XX
Parameters	XX = 01 to 20 for Bin Number, 00 for ALL
Description	You may clear any or all of the General Purpose Number Bins. By entering 8900 you will erase ALL bins, while 8905 will erase only bin 5. If you wish to clear one of the bins 11 to 20 for a specific line enter the Line Selection for Programming code, 098, followed by the line number, followed by *# (Enter Key). Enter '89' followed by the two digit bin number, followed by *# (Enter Key).

DISABLE DIALER

Code	8*X
Parameters	X = 0 to enable the controller and line ports X = 1 to 8 to disable the line port X = * to disable all ports
Description	You may enable or disable the controller with this command. If you disable the controller or specific line ports they becomes completely inactive. However, it will still respond to the programming command ***00*#. When reenabled all previous programming will be restored.

CALL PROGRESS FEATURE

Code	8#X
Parameters	X = 0 to disable Call Progress Feature X = 1 to 8 to enable Call Progress for selected line
Description	You may enable or disable Call Progress feature with this command for a particular line. When this feature is enabled each program instruction is displayed on the terminal screen as it is executed by the dialer. This is very useful when attempting to find out at which point a program may be failing. This feature has been enhanced and gives a programmer the ability to determine the timing of the tone cadence from a local dialer. Once the program executes the 56XYY instruction, the timing of the tone seen by the dialer will be displayed on the computer screen. It is in the following format; 1 – XXX –Y (1 = On time, XXX = On time, Y = 1 for tone A, 2 for Tone B, 3 for neither) 2 – AAA – B (2 = Off time, AAA = On time, B = 1 for tone A, 2 for Tone B, 3 for neither) If the On time matches the settings of cadence 'A' then the Off time that must be matched is that of cadence 'A', the Off time of cadence 'B' will be ignored.

DISPLAY CALL PEG COUNTER/TIMER

Code	090X(Y Y)
Parameters	X = 0 to clear all peg counts X = 1 to display all peg counts X = 2 to display all bins with values other than 00000000 X = 3, YY = Bin Number 00-20 to display individual bin Enhanced Call Peg Counter available Version 800143 and later

DISPLAY CALL PEG COUNTER

Code	092X
Parameters	X = 0 to display peg counts X = 1 to clear all peg counts
Description	This command will display the number of times that all programs have been used to process calls. It is presented as the 2 digit program number followed by an up to 4 digit number representing the number of times the program was used to process calls since the last time the counter was reset.

DISPLAY SERIAL NUMBER

Code	095
Parameters	None
Description	This command will allow the electronic serial number to be recalled from the dialer.

DATA CONFIRMATION MODE

Code	099X
Parameters	X = 0 = Off X = 1 = On

Description This mode gives a programmer the ability to retrieve the system parameters from a remote dialer. Each parameter must be retrieved individually. The procedure to use this feature is as follows;

- 1) Enter programming mode on a remote dialer as would normally be done.
- 2) Once in program mode of the remote dialer enter 0991, then press the Enter key. This will put the remote dialer into Data Confirmation Mode.
- 3) Now enter the System Parameter you wish to see. For example, if you wish to check the DTMF On Time, you enter 026 and the remote dialer will output the value that is set. Do not press the enter key after the parameter code has been entered.
- 4) To return to normal program mode, enter 0990, then press the Enter key.

If you do not take the dialer out of Data Confirmation Mode and sign off the remote dialer, it will automatically be returned to normal mode.

LOAD COMMANDS**CLEAR AND LOAD PRIMARY TABLE**

Code	90
Parameters	NONE
Description	When loading a completely new search table it is not efficient to first use the Clear Primary Table (870) command followed by table maintenance commands, 1X. Table maintenance commands are designed for adding or deleting a few entries, to keep a table up to date. Each time a new entry is made to a table, the entire table is first searched to ensure the number does not already exist. If it exists, it is first deleted, and then replaced with the new entry. This process will slow down loading of a completely new table, as each entry must go through this process. The 90 Command, Clear and load Primary table, should be used instead. This command clears the table, and accepts table entries without checking for duplicates, as it is assumed that the table being loaded will have been verified for accuracy first.

CLEAR AND LOAD SECONDARY TABLE

Code	91
Parameters	NONE
Description	See Clear and Load PrimaryTable.

CLEAR AND LOAD PULSE METER SEARCH TABLE

Code	92
Parameters	NONE
Description	See Clear and Load Primary Table.

CLEAR AND LOAD USER TABLE

Code	93
Parameters	NONE
Description	See Clear and Load Primary Table.

CLEAR AND LOAD CLIENT TABLE

Code	94
Parameters	NONE
Description	See Clear and Load Primary Table.

ACTION CODES

Each Primary and Secondary Search Table Entry, has associated with it an Action Code. The following is a listing of acceptable action codes.

DELETE ENTRY

Code	00
Description	When in table maintenance, entering 00 as an action code will delete the entry. For example if an entry in the primary table of 1416 exists, and you wish to delete it, simply enter 1 1416 00 *# .

LAUNCH PROGRAM

Code	01 to 20, 25 to 50
Description	An entry with an action code of 01 to 20 or 25 to 50 will upon a match execute the parallel program of that number. For example an entry 1416 05 in the primary table, would match if the user Dialed 1416, and then would immediately begin execution of parallel program 5.

PLAY CURRENT SETTING

Code	##
Description	When in Table Maintenance (See 1X, 2X or 3X), an action code of ## will cause that individual table entry to be played (DTMF). For example the entry 1 1416 ## *# will cause a search of the primary table, looking for 1416, when found, the action code for 1416 will be played. If no match is found, then no response will be sent.

REMOTE DIALER PROGRAMMING

Using the RS232 Data Port of a local AXS dialer and the *ZooKeeper*[®] program, remote dialers can be programmed. Once in PROGRAMMER MODE the data port will provide ASCII to DTMF and DTMF to ASCII conversion so that all programming can be done directly from a PC.

1. Click the **Upload** icon on the toolbar or Upload from the main menu of *ZooKeeper*[®]. The Upload interface screen will appear.
 2. If this is the first time that the Upload screen is going to be used you should configure the program for the communications port it will use. Click '**Port**' on the menu at the top, then '**Configure**'. The '**Settings**' dialogue box appears which displays the different items that need to be set. They are the Com Port, Baud Rate, Number of Data Bits, Parity, Number of Stop Bits and Flow Control. Each item has a drop down list that can be used to make the proper selection. Click 'OK'.
 3. Click '**Port**', '**Save Configuration**' to retain the settings.
 4. Select the connection type as 'Remote Manual'.
 5. Place a telephone call to the remote dialer using the telephone connected to the AXS™ dialer that is being used to do the programming.
 6. When the remote end answers, either automatically or by someone, click the '**Connect**' icon from the toolbar or 'Connection', 'Connect' from the main menu.
 7. 'Programmer Mode OK' appears in the upper half of the transmission window when you have entered programmer mode on the local dialer. '**PRO-MODE**' appears in the green Transmission LED window.
 8. Below the Transmit Window is a box indicating the line status. Once the remote end answers and the Program Mode access code has been recognized, the line status message changes to 'Remote OK Received' and 'D' appears in the Receive Window.
 9. Click the down arrow of the box in the upper part of this option box. This action will display a Drop Down List of diagnostic codes that can be selected. Click the code you wish to use. It will be highlighted and entered into the text box.
 10. If the code selected contains variables then you must enter the required variable in the box labeled '**Parameters**'.
 11. Click the '**Check**' button.
 12. The diagnostic command being sent to the dialer is displayed in the bottom Transmission Window.
 13. The response from the dialer is displayed in the upper Transmission Window.
- The second way to use the Transmission Windows is as follows:
1. Move the cursor to the bottom Transmission Window, click the left mouse button.
 2. Type the desired diagnostic code.
 3. The response appears in the upper Transmission Window.
 4. When finished click the '**Disconnect**' icon from the toolbar or 'Connection', 'Disconnect' from the main menu. 'LEAVING PROGRAMMING MODE' appears in the upper portion of the window.

Note: The com port adapter used with the AXS will not work with M-AXS for local programming.

The following are a list commands to enter and exit PROGRAMMER MODE of a local AXS, if a Communications Program other than *Zoo Keeper*[®] is being used:

Pmh1 : Go OFF-HOOK

Sending Pmh1 to AXS via the data port, will cause AXS to go off hook towards the TELCO and SPLIT the Telephone Side from the Trunk Side. Upon completion of this command AXS will respond with an OK .

Once OFF-HOOK, AXS enters a mode in which all valid DTMF digits received on the DATA PORT are converted to DTMF (or PULSE depending on the P3 or P4 commands below) and echoed out to the TELCO. All NON-DTMF Digits (Such as these PM commands) are not echoed.

All DTMF digits detected on the TELCO line are converted to ASCII and echoed back out the PC via the DATA PORT.

P0 : Go ON-HOOK

Sending P0 to AXS via the data port will cause AXS to go on hook towards the TELCO and JOIN the Telephone Side and Trunk Side. Upon completion of this command AXS will respond with an OK. This command is only recognized when in Pmh1 Mode and causes AXS to exit Pmh1 mode.

P2 : Detect Dial Tone

Sending P2xx to AXS via the data port will cause AXS to wait up to xx seconds for dial tone on the Trunk Side. Upon success, AXS will respond with OK. Upon failure, AXS will respond with ?! This command is only recognized when in Pmh1 Mode.

P3 : Switch to Pulse Dialing

Sending P3 to AXS via the data port will cause AXS to transmit any further digits towards the TELCO as Pulse. Upon completion, of this command, AXS will respond with OK. This command is only recognized when in Pmh1 Mode.

P4 : Dial Tone Digits (DTMF)

Sending P4 to AXS via the data port will cause AXS to transmit any further digits towards the TELCO using DTMF. Upon completion, of this command, AXS will respond with OK. This command is only recognized when in Pmh1 Mode.

P5 : Wait for Silence after FAX Tone

Sending P5 to AXS via the data port will cause AXS to detect a FAX tone from the answering FAX Machine, then to wait for Silence. This is used to make sure you have silence when attempting to access a M-AXS unit remotely.

UPLOADING

Programming of a dialer can be accomplished by developing a database of system parameters and programs using the *Zoo Keeper*® program and then uploading this program into the dialer(s) via the RS232 port. Several databases can be developed for different applications and/or countries and then recalled and downloaded into dialers when required. Once the program has been installed into the dialer any minor changes required, such as the Callback telephone number in the Bin being used to call to the switch, can be done quickly. The following is the steps to take to Upload a program to a local dialer.

Uploading a Program to a local dialer:

1. Select the database record you wish to Upload from the 'Company Name' list.
2. Click the **Upload** icon on the toolbar or Upload from the main menu. The Upload interface screen will appear.
3. If this is the first time that the Upload is going to be used you should configure the program for the communications port it will use. Click '**Port**' on the menu at the top, then '**Configure**'. The '**Settings**' dialogue box appears which displays the different items that need to be set. They are the Com Port, Baud Rate, Number of Data Bits, Parity, Number of Stop Bits and Flow Control. Each item has a drop down list that can be used to make the proper selection. Click 'OK'.
4. Click '**Port**', '**Save Configuration**' to retain the settings.
5. Select the connection type as 'Local'.
6. Select the items you wish to send to the dialer in the '**Upload Options**' box. Selection is done by moving the cursor to the desired item and clicking.
7. Click the '**Connect**' icon from the toolbar or 'Connection', 'Connect' from the main menu.
8. 'Programming Mode OK' appears in the upper half of the transmission window when you have entered programming mode.
9. Click the '**UPLOAD**' button in the bottom right corner of the screen. The first parameter that was selected in the Uploads options box is highlighted. The parameters are displayed in the window beside the Upload button as they are being sent. As each parameter is sent an 'OK' or 'ERROR' appears in the Receive Window to indicate the status.
10. When all the selected parameters have been sent 'TX - Done' is displayed by the Transmission LED.
11. Click the '**Disconnect**' icon from the toolbar or 'Connection', 'Disconnect' from the main menu.

REMOTE UPLOADING

Zoo Keeper® can be used to upload programs to dialers at remote locations. At your office you must have an AXS dialer, PTT line, telephone set and computer that has the *Zoo Keeper*® installed on it. Connect the AXS to the computer via the RS232 jack on the AXS and the com port of the computer with the 8 Pin programming cable. Connect the PTT line and telephone to the AXS. A modem is not required for remote programming as the AXS contains a feature called '**Programmer Mode**', which converts the dialer into an ASCII to DTMF/DTMF to ASCII converter. This means that all commands sent from the dialer to the remote end are converted to DTMF signals, and the responses from the remote end are converted to ASCII text and displayed on the computers screen.

Uploading a program to a Remote Dialer – Manual Dial:

1. Select the database record you wish to Upload from the 'Company Name' list.
2. Click the **Upload** icon on the toolbar or Upload from the main menu. The Upload interface screen will appear.
3. If this is the first time that the Upload is going to be used you should configure the program for the communications port it will use. Click '**Port**' on the menu at the top, then '**Configure**'. The '**Settings**' dialogue box appears which displays the different items that need to be set. They are the Com Port, Baud Rate, Number of Data Bits, Parity, Number of Stop Bits and Flow Control. Each item has a drop down list that can be used to make the proper selection. Click 'OK'.

4. Click '**Port**', '**Save Configuration**' to retain the settings.
5. Select the connection type as 'Remote Manual'.
6. Select the items you wish to send to the dialer in the '**Upload Options**' box. Selection is done by moving the cursor to the desired item and clicking.
7. Place a telephone call to the remote dialer using the telephone connected to the AXS™ dialer that is being used to do the programming.
8. When the remote end answers, either automatically or by someone, click the '**Connect**' icon from the toolbar or 'Connection', 'Connect' from the main menu.
9. 'Programmer Mode OK' appears in the upper half of the transmission window when you have entered programmer mode on the local dialer. '**PRO-MODE**' appears in the green Transmission LED window.
10. Below the Transmit Window is a box indicating the line status. Once the remote end answers and the Program Mode access code has been recognized, the line status message changes to 'Remote OK Received' and 'D' appears in the Receive Window.
11. Click the '**UPLOAD**' button in the bottom right corner of the screen. The first parameter that was selected in the Uploads options box is highlighted. The parameters are displayed by the Transmission LED as they are being sent. As each parameter is sent a 'D' or 'BB' appears in the Receive Window to indicate the status.
12. When all the selected parameters have been sent 'TX - Done' is displayed.
Click the '**Disconnect**' icon from the toolbar or 'Connection', 'Disconnect' from the main menu.

Uploading a program to a Remote Dialer using the Auto-dial feature:

1. Select the database record you wish to Upload from the 'Company Name' list.
2. Click the **Upload** icon on the toolbar or Upload from the main menu. The Upload interface screen will appear.
3. If this is the first time that the Upload is going to be used you should configure the program for the communications port it will use. Click '**Port**' on the menu at the top, then '**Configure**'. The '**Settings**' dialogue box appears which displays the different items that need to be set. They are the Com Port, Baud Rate, Number of Data Bits, Parity, Number of Stop Bits and Flow Control. Each item has a drop down list that can be used to make the proper selection. Click 'OK'.
4. Click '**Port**', '**Save Configuration**' to retain the settings.
5. Select the connection type as 'Remote Auto-dial'.
6. Select the items you wish to send to the dialer in the '**Upload Options**' box. Selection is done by moving the cursor to the desired item and clicking.
7. Click the '**Connect**' icon from the toolbar or 'Connection', 'Connect' from the main menu.
8. 'Programmer Mode OK' appears in the upper half of the transmission window when you have entered programmer mode on the local dialer. '**DIALING**' appears in the green Transmission LED window.
9. Below the Transmit Window is a box indicating the line status. Once the remote end answers and the Program Mode access code has been recognized, the line status message changes to 'Remote OK Received', '**PRO_MODE**' appears in the Transmission LED and 'D' appears in the Receive Window.
10. Click the '**UPLOAD**' button in the bottom right corner of the screen. The first parameter that was selected in the Uploads options box is highlighted. The parameters are displayed by the Transmission LED as they are being sent. As each parameter is sent a 'D' or 'BB' appears in the Receive Window to indicate the status.
11. When all the selected parameters have been sent 'TX - Done' is displayed.
12. Click the '**Disconnect**' icon from the toolbar or 'Connection', 'Disconnect' from the main menu.

Note: The com port adapter used with the AXS will not work with M-AXS for local programming.

Remote Dialer Maintenance

Zoo Keeper® can be used to update and maintain programs of dialers at remote locations. At your office you must have an AXS dialer, PTT line, telephone set and computer that has the *Zoo Keeper*® installed on it. Connect the AXS to the computer via the RS232 jack on the AXS and the com port of the computer with the 8 Pin programming cable. Connect the PTT line and telephone to the AXS. A modem is not required for remote programming as the AXS contains a feature called '**Programmer Mode**', which converts the dialer into an ASCII to DTMF/DTMF to ASCII converter. This means that all commands send from the dialer to the remote end are converted to DTMF signals, and the responses from the remote end are converted to ASCII text and displayed on the computers screen.

1. Click the **Upload** icon on the toolbar or Upload from the main menu. The Upload interface screen will appear.
2. If this is the first time that the Upload is going to be used you should configure the program for the communications port it will use. Click '**Port**' on the menu at the top, then '**Configure**'. The '**Settings**' dialogue box appears which displays the different items that need to be set. They are the Com Port, Baud Rate, Number of Data Bits, Parity, Number of Stop Bits and Flow Control. Each item has a drop down list that can be used to make the proper selection. Click 'OK'.
3. Click '**Port**', '**Save Configuration**' to retain the settings.
4. Select the connection type as '**Remote Manual**'.
5. Place a telephone call to the remote dialer using the telephone connected to the AXS™ dialer that is being used to do the programming.
6. When the remote end answers, either automatically or by someone, click the '**Connect**' icon from the toolbar or 'Connection', 'Connect' from the main menu.
7. 'Programmer Mode OK' appears in the upper half of the transmission window when you have entered programmer mode on the local dialer. '**PRO-MODE**' appears in the green Transmission LED window. Below the Transmit Window is a box indicating the line status. Once the remote end answers and the Program Mode access code has been recognized, the line status message changes to 'Remote OK Received' and 'D' appears in the Receive Window.
8. Click the down arrow of the box in the upper part of the Diagnostic Procedure box. This action will display a Drop Down List of diagnostic codes that can be selected. Click the code you wish to use. It will be highlighted and entered into the text box.
9. If the code selected contains variables then you must enter the required variable in the box labeled '**Parameters**'.
10. Click the '**Check**' button.
11. The diagnostic command being sent to the dialer is displayed in the bottom Transmission Window.
12. The response from the dialer is displayed in the upper Transmission Window.
13. When finished click the '**Disconnect**' icon from the toolbar or 'Connection', 'Disconnect' from the main menu. 'LEAVING PROGRAMMING MODE' appears in the upper portion of the window.

The second way to use the Transmission Windows is as follows:

1. Move the cursor to the bottom Transmission Window, click the left mouse button.
2. Type the desired diagnostic code.
3. The response appears in the upper Transmission Window.
4. When finished click the '**Disconnect**' icon from the toolbar or 'Connection', 'Disconnect' from the main menu. 'LEAVING PROGRAMMING MODE' appears in the upper portion of the window.

Clicking the right mouse button after highlighting information on the top half of the transmission window will activate a dialogue box, '**Copy to Clipboard**'. Clicking on this will copy the information on the screen to the computer clipboard where it can be viewed or pasted to another program such as Notepad.

To exit the Upload screen click the '**Close**' icon on the toolbar or 'File' 'Close' on the main menu.

GENERAL PURPOSE BIN ONLY PROGRAMMING

General Purpose Bin Only Programming is available on the M-AXS from a DTMF phone. This will allow programming access only to the General Purpose Bins, that are used to store the DID numbers, Local Node Numbers and / or Pin Numbers for Callback or Fax Store and Forward. The entire program can not be accessed through this code. The code is ****0*#.

A system parameter has been added in junction with the above that will allow you to program a Bin Only Programming Password. The Password is independent of any programming access code that you may have programmed into the system.

To Use the Bin Only Programming Feature

- 1) Go Off-Hook on the telephone connected to the dialer.
- 2) Enter the Bin Only Programming Code ****0*#
- 3) Dialer will return 'DD' tones as confirmation of entry into programming mode.
- 4) If required enter the Bin Only Programming Password.
- 5) Dialer will return a 'D' tone as confirmation of the entry of the correct password.
- 6) Enter the Bin Number and number you wish to program followed by *#. If the Bin Number entered is 11-20 then the Line Specific Bin will be programmed.
- 7) Dialer will return a 'D' tone as confirmation of the entry.
- 8) Repeat step 5 to enter other Bin numbers or Hang up to exit Program Mode.

APPENDIX "A"

PROGRAM MODE COMMANDS

Code	Description	Parameters
0XXYY *#	System Parameter Setting	XX = Parameter Number (Appendix "B") YY = Setting
Eg: 0 23 1 *# Set Pulse Dialing Speed to 10 PPS		
1XXAA *#	Primary Table Maintenance:	XX = Digits to enter into Table AA = Action
Eg: 1 1416555 03 *# Add 1416555 to the primary search table, and on a match go execute program 03		
2XXAA *#	Secondary Table Maintenance:	XX = Digits to enter into Table AA = Action
Eg: 2 1900 20 *# Add 1900 to the secondary search table, and on a match execute program 20.		
31XXYYZZZZZ *#	Pulse Meter Frequency Surcharge Table Maintenance	XX = Table Entry Number YY = Number of Pulses ZZZZZ = Pulse Meter Frequency
4PPXX *#	Program Maintenance	PP = Program Number 01 to 20 for Parallel Program 21 for Drop Program 22 for Ring Program XX = Program STRING (See Appendix "D")
Eg: 4 01 90 92 75 700 99 *# Places a short program into program 01		
5SSXX *#	Speed Dial Maintenance	SS = Speed Dial # (01 to 99) XX = Speed Dial STRING *# = Denotes END of SPEED DIAL STRING
Eg: 5 01 5551212 *# Place 5551212 into speed dial bin 01		
6BBXX *#	Bin Maintenance	BB = Bin Number (01 to 20) XX = Bin Dial STRING
Eg: 6 01 5551212 *# Place 5551212 into bin 01		
71XSS *#	Verified User Code Table Maintenance	XX = User Code to enter SS = Security Level (00 to 99)
72XSS *#	Verified Client Code Table Maintenance	XX = Client Code SS = Security Level (00 to 99)
80	Play Version Number	

81XX	Play Program	XX	= 00 - ALL Programs
		XX	= 01 to 20 - Individual Program
		XX	= 21 for DROP Program
		XX	= 22 for RING Program

820 Play Primary Table (ALL)

821XXYY	Play Primary Table (Range)	XX	= Range with Length >=
		YY	= Range with Length <=

Eg: **821 0104 *#** will play all primary table entries with a length of from 1 to 4 digits in length.

822 Play Secondary Table (ALL)

823XXYY	Play Secondary Table (Range)	XX	= Range with Length >=
		YY	= Range with Length <=

Eg: **823 0104 *#** will play all secondary table entries with a length of from 1 to 4 digits in length.

824 Play Pulse Meter Search Table (ALL)

32XX	Play Pulse Meter Frequency/Surcharge Table	XX	= 00 - All Entries
		XX	= 01 - 99 - Specific Entry

826 Play User Code Table (ALL)

827XXYY	Play User Code Table (Range)	XX	= Range with Length >=
		YY	= Range with Length <=

Eg: **827 0405 *#** will play all User Code entries with a length of from 4 to 5 digits in length.

828 Play Client Code Table (ALL)

829XXYY	Play Client Code Table (Range)	XX	= Range with Length >=
		YY	= Range with Length <=

Eg: **829 0405 *#** will play all Client Code entries with a length of from 4 to 5 digits in length.

83XX	Play Speed Dial Bin	XX	= 00 - ALL Bins
		XX	= 01 to 99 for individual bin

84XX	Play General Purpose Bin	XX	= 00 - ALL Bins
		XX	= 01 to 20 for individual bin

85 Play ALL System Parameter to the Data Port

86XX	Clear Program	XX	= 00 - ALL Programs
		XX	= 01 to 20 for Parallel Program
		XX	= 21 for DROP Program
		XX	= 22 for RING Program

87X	Clear Table		X	= 0 - Primary Table
			X	= 1 - Secondary Table
			X	= 2 - Pulse Meter SearchTable
			X	= 3 - User Table
			X	= 4 - Client Table
88XX	Clear Speed Dial Bin		XX	= 01 to 99 for Bin Number
			XX	= 00 for ALL Bins
89XX	Clear General Purpose Bin		XX	= 01 to 20 for Bin Number
			XX	= 00 for ALL Bins
8*X	Enable or Disable Dialer	X		= 0 Enable Dialer
			X	= 1 Disable Dialer
8#X	Enable or Disable Call Progress		X	= 0 Disable Call Progress
			X	= 1 - 8 Enable Call Progress
8#Y	Enable or Disable X.25 Call Progress		Y	= 0 Disable Call Progress
			Y	= 9 Enable Call Progress
90	Clear and Load Primary Table			
91	Clear and Load Secondary Search Table			
92	Clear and Load Pulse Meter Search Table			
93	Clear and Load User Table			
94	Clear and Load Client Table			
97X	Load X.25 Script		X	= 0 Load Test Script
			X	= 1 Load X.25 Script 1
			X	= 2 Load X.25 Script 2
98X	Display X.25 Script		X	= 1 Dump X.25 Script 1
			X	= 2 Dump X.25 Script 2
			X	= 3 Dump X.25 Script 3
092X	Display Call Peg Counters		X	= 0 Display Counters
			X	= 1 Reset Counters
095	Display electronic serial number			

APPENDIX "B"**SYSTEM PARAMETERS****System Wide Parameters:**

Code	Description	Parameters
000XX	set dialer id	XX = 01-99
002X	set SMDR baud rate	X = 1 - 1200 BPS X = 2 - 2400 BPS X = 3 - 9600 BPS X = 4 - 19200 BPS X = 5 - 38400 BPS
005XX	set program mode time out	XX = 05-99 (X seconds)
006XX	set failure retries	XX = 00-10
007XX	set default parameters (NA)	
008XX	set defaults tables (NA)	
009XX	set pass word	XX = 1-8 digits
010XX	set bin only program password	XX = 1-8 digits
011XX	networking option	XX = 00-15
012X	X.25 Port Baud Rate	X = 1 - 1200 BPS X = 2 - 2400 BPS X = 3 - 9600 BPS X = 4 - 19200 BPS X = 5 - 38400 BPS
013XY	call home mode	X = 0 No Call Home X = 1 Call Home on Call Home Day at midnight X = 2 Call Home on Call Home Day within Call Home Hour at Call Home Minute X = 3 Call Home at Random Time on Call Home Day X = 4 Call Home on Call Home Day randomly within Call Home Hour Y = 1 Call Home within 10 minutes after power up, after first phone call Y = 0 No Call Home after power up.
014XX	days left	XX = 00-99 days
015XXYY	automatic call home	XX = 00-99 (days) YY = 00-23 (hours)
017X	call home failure retries	X = 0-9
018XX	call home failure retries interval	XX = 00-99 minutes
025XX	set DTMF level	XX = 01-15
028XX	set DTMF boost level	XX = 01-15
032XX	set reseize time	XX = 01-99 (X 50ms)

034X	set ring detect sensitivity	X = 0-9	
035X	set ignore ring high	X = 0-1	
036X	set ring cadence off time	X = 1-9 (X seconds)	
044XXXXYYYY	set dial tone output frequency	XXXX = low frequency Hz YYYY = high frequency Hz	
045XXXXYYY	set progress frequency	XXXX = low frequency Hz YYYY = high frequency Hz	
046XXXXYYYY	set beep frequency	XXXX = low frequency Hz YYYY = high frequency Hz	
047XXYY	ring detect tone frequency	XX = low frequency Hz YY = high frequency Hz	
050XX	set off hook recognition	XX = 00-99 (X 10ms)	
051XX	set digit refusal time	XX = 00-99 (X 10ms)	
053XX	set initial interdigit time out	XX = 05-99 (X seconds)	
054XX	set interdigit time out	XX = 02-99 (X seconds)	
055XX	set on hook time	XX = 00-99 (X 20ms)	
056XX	set initial user client time out	XX = 02-99 (X seconds)	
060X	set speed dial prefix	X = single digit access code	
061XY	set force program prefix	X = single digit code Y = 0-1	
062X	set force continue	X = single digit access code	
063XX	set user speed dial prog. Prefix	XX = two digit access code	
064XX	set new call scan digits	XX = one or two digit access code	
070DDMMYY (01-12)	set date	DD = day (01-31) YY = year (00-99)	MM = month
071HHMMSS (00-59)	set time	HH = hour (001-23) SS = seconds (00-59)	MM = minute
079XXXXX	X.25 keep alive script interval	X = 00000 - 99999 seconds	
080X	pulse meter frequency	X = 0 -12,000 Hz X= 1 - 16,000 Hz	
081XX	pulse meter surcharge pause	XX = 10-99 (X 10ms)	
082XX	pulse meter duration	XX = 05-99 (X 10ms)	

083XX	set audio level	XX = 01-11
084X	pulse meter extended pause	X = 1- On, X = 0 - Off
093X	join command overlap	X = 0-9 (x 10ms)
098X	select line for programming	X = 1-8
099X	set data confirmation mode	X = 0-1

APPENDIX "B" SYSTEM PARAMETERS

Line Specific Parameters:

Code	Description	Parameters
003X	set idle mode	X = 0-split X = 1-joined
021X	set dial mode (outgoing)	X = 1- DTMF X = 2 - pulse
023X	set pulse speed	X = 1 - 10 PPS 60/40 X = 2 -20 PPS 60/40 X = 3 - 10 PPS 67/33 X = 4 -20 PPS 67/33
024XX	set pulse interdigit	XX = 04-99 (X 50 ms)
026XX	set DTMF on time	XX = 04-99 (X 10ms)
027XX	set DTMF off time	XX = 04-99 (X 10ms)
029XXYY	set dial shunt	XX = Predial ms. YY = Postdial ms.
040XXXXYYYYZZ	set dial tone frequency	XXXX = 0100-2499 (low frequency Hz) YYYY = 0100-2499 (high frequency Hz) ZZ = 05-75 (tolerance percentage)
041XXXXYYYYZZ	set ring back frequency	XXXX = 0100-2499 (low frequency Hz) YYYY = 0100-2499 (high frequency Hz) ZZ = 05-75 (tolerance percentage)
042XXXXYYYYZZ	set busy tone frequency	XXXX = 0100-2499 (low frequency Hz) YYYY = 0100-2499 (high frequency Hz) ZZ = 05-75 (tolerance percentage)
043XXXXYYYYZZ	set tone burst frequency	XXXX = 0100-2499 (low frequency Hz) YYYY = 0100-2499 (high frequency Hz) ZZ = 05-75 (tolerance percentage)
048XXXXYYYYZZAABBCCDD	set tone 1 cadence	XXXX = 0100-2499 (low frequency Hz) YYYY = 0100-2499 (high frequency Hz) ZZ = 05-75 (tolerance percentage) AA = Cadence A On Time (x 100 ms) BB = Cadence A Off Time (x 100ms) CC = Cadence B On Time (x 100 ms) DD = Cadence B Off Time (x 100ms)
049XXXXYYYYZZAABBCCDD	set tone 2 cadence	XXXX = 0100-2499 (low frequency Hz) YYYY = 0100-2499 (high frequency Hz) ZZ = 05-75 (tolerance percentage) AA = Cadence A On Time (x 100 ms) BB = Cadence A Off Time (x 100ms) CC = Cadence B On Time (x 100 ms) DD = Cadence B Off Time (x 100ms)

052X	set dialing type	X = 0 - DTMF or pulse X = 1 - DTMF only	X = 2 -pulse only
0650X	set centrex compatibility	X = 0 - off	X = 1-6 (ext. digit length)
065XYY	set centrex access codes	X = 1-5 (code number) YY = one or two digit access code	
066XYY	drop program select	x = line number	YY = program number
067XYY	ring program select	x = line number	YY = program number

APPENDIX "C" SERIAL COMMANDS

It is possible to send commands to the M-AXS through the RS232 port to control each line of the dialer. These commands are entered into the dialer without going into program mode and are case sensitive and must be entered exactly as shown. These are very helpful to provide full control over the line in an application such as a Call Shop.

GetSMDR? (? = 1-8 for desired line) Entering this command instructs the dialer to send out via the SMDR port the current call record for the requested line. If there is no call record for the line a message is sent via the SMDR port indicating there is no record.

HangUp? (? = 1-8 for desired line) Entering this command instructs the dialer to terminate the call and hang up the line.

DoBeep? (? = 1-8 for desired line) Entering this command instructs the dialer to send a beep to the desired line.

EnableLine? (? = 1-8 for desired line) Entering the command will enable the line to be used for placing a call. This command is used in conjunction with the following command.

DisableLine? (? = 1-8 for desired line) Entering this command will disable the line and it will not be able to be used for placing calls until it has been enabled with the command above.

APPENDIX "D"

PROGRAM INSTRUCTIONS

RING / DROP / PARALLEL

Code	Description	Parameters
00	No-Operation	
01	Silence to Drop	
05	Send SMDR Record Now	
07XXYYYY	Dial YY Digits to Drop Side	XX = Number of Digits to dial YY = Digits to Dial
<p>The following are allowed digits in a 10 Instruction 0 to 9, A,B,C,D, and # Dial Digit</p> <p>*5 DTMF Digit A (Used if NO A,B,C or D can be generated)</p> <p>*6 DTMF Digit B " "</p> <p>*7 DTMF Digit C " "</p> <p>*8 DTMF Digit D " "</p> <p>** Dial "*" Digit</p>		
08WWXXYYZ	Automatic Bin Change	WW = Number of Digits to Expect XX = Bin Number to Change YY = Time to Wait for First Digit Z = Time to Wait for Subsequent Digits
09	Wait for Hang-Up by User (Or an Auto-Answer Time Out) - Pulse Metering	
10XXYYYY	Dial YY Digits to Trunk Side	XX = Number of Digits to dial YY = Digits to Dial
<p>The following are allowed digits in a 10 Instruction 0 to 9, A,B,C,D, and # Dial Digit</p> <p>*5 DTMF Digit A (Used if NO A,B,C or D can be generated)</p> <p>*6 DTMF Digit B " "</p> <p>*7 DTMF Digit C " "</p> <p>*8 DTMF Digit D " "</p> <p>** Dial "*" Digit</p>		
19	Detect Tip and Ring Reversal (Stop Metering)	
20	Switch to Tone Dialing on Trunk Side	
21	Switch to Pulse Dialing on Trunk Side	
22XXYY	Change DTMF Dial Speed	XX = 03-99 x 10ms On Time YY = 03-99 x 10ms Off Time
25X	DTMF Boost	X = 0 - Normal DTMF Output X = 1 - Boosted Output
29X	Display Per Call Information	X = 0 – DTMF X = 1 – Serially

30	Calculate Checksum	
31	Dial Checksum to Line	
32	XXYYZZZZZ Go to X.25 script	XX = Time in seconds to wait for a RETURN instruction to be executed in script. Y = Number of 2 digit arguments to follow ZZZZ = An argument to the X.25 used by the SENDARG instruction
34	XX	Go to Program XX After Hang up
35	XX	Go to Program XX
36		Hang Up Trunk Side, Loop Back and Restart Program - For a Maximum # of Retries.
37	XX	Go To Function Program XX
38	X	Return to Original Program X = 0 or 1
39	XX	Detect Tone Duration XX = 00-99 (x 20ms)
40	XX	Verify User Code XX = Security Level
41	XX	Verify Client Code XX = Security Level
45		Wait for User
48	XX	Detect Tip and Ring Reversal (Start Metering) XX = Seconds to Wait (01 to 99)
49	XX	Detect Meter Pulse on Trunk Side XX = Seconds to Wait (01 to 99)
50	XX	Detect Dial Tone on Trunk Side XX = Seconds to Wait (01 to 99)
51	XY	Detect DTMF Digit on Trunk Side X = Digit to Detect YY = Seconds to Wait (01 to 99)
52	XX	Detect Tone Burst on Trunk Side XX = Seconds to Wait (01 to 99)
53	XX	Detect Busy Tone on Trunk Side XX = Seconds to Wait (01 to 99)
55	XX	Wait for Host XX = Seconds to Wait (01 to 99)
56	XY	Detect Tone Cadence X = 1 for Tone 1, 2 for Tone 2 YY = Seconds to Wait (01 to 99)
57	XY	Detect Ring Back Tone on Trunk Side XX = Seconds to Wait (01 to 99) YY = # of Rings to Wait For
58	XX	Wait for Call Back XX = Seconds to Wait (01 to 99)
59	XX	Delay XX = 01 to 99 (X 100 Milliseconds)

83	Provide Call Progress Tone to the Drop	
85XY	Test Day of Week	X = Start Day Y = Stop Day
86X	Tip and Ring Reversal	X = 1 Reverse Tip and Ring Polarity X = 0 Normal Tip and Ring Polarity
87	Set Time of Day	
88HHMMhhmm	Test Time of Day	HHMM = Start Day hhmm = Stop Day
891	Continue after hang up	
90	Go OFF-HOOK Trunk Side	
91	Hang-Up Trunk Side	
92	Split Trunk and Drop	
93	Join Trunk and Drop	
9400	Wait for User to Answer an incoming Telephone Call	
94XX	Wait for User to Answer an incoming Call, or Auto-Answer after XX Rings	
95	Manually start SMDR Record.	
96	Prevent SMDR Record	
97	Hang-Up and Re-Order	
98	Hang-Up and Clean-Up	
99	Wait for Hang-Up by User (Or an Auto-Answer Time Out) - No Pulse Metering	

APPENDIX "E" DTMF / DATA PORT DIFFERENCES

Equivalent Codes:

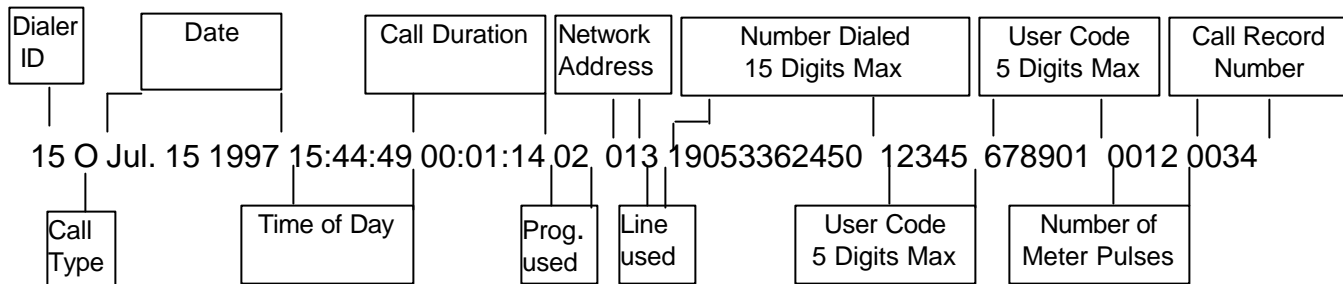
Description	DTMF Version	Data Port Version	Applies
Enter	*#	Enter (HEX 0D)	Universal
Don't Care	*0	?	Search Tables
Any Digit except 0 or 1	*1	!	Search Tables
0 or 1	*2	\$	Search Tables 10XXYY Dail String Bin Maintenance Detect DTMF Digit Force Program Prefix
DTMF DIGIT "A"	A, or *5	A	"
DTMF DIGIT "B"	B, or *6	B	"
DTMF DIGIT "C"	C, or *7	C	"
DTMF DIGIT "D"	D, or *8	D	"
DTMF DIGIT ""	**	**	"

Programming Examples:

The following is an example of a simple programming session.

Description	DTMF Version	Data Port Version
Enter Wake-Up Mode	***00*#	***00<ENTER>
Enter Password	98765	98765
Change SMDR Baud Rate to 1200	0 02 1 *#	0 02 1 <ENTER>
Add 1416 selecting Program 2, to Primary Table	1 1416 02 *#	1 1416 02 <ENTER>
Restrict ALL 976 Calls	2 *0*0*0 976 20 *#	2 ??? 976 20 <ENTER>
Change Password to 12345	0 09 12345 *#	0 09 12345 <ENTER>

SMDR RECORD FORMAT



PULSE METERING APPLICATION NOTE

Pulse Metering is required for Call Accounting systems for billing purposes. Without the M-AXS the PTT sends pulses out on the line which are used for billing purposes. When Call back is used these pulses must be generated from something other than the PTT, as the actual destination leg of the call is placed on an incoming call and therefore no meter pulses are generated. The M-AXS has the ability to create meter pulse at 12,000 or 16,000 Hz., the two most prevalent frequencies in the world. There are a couple of countries that have 50,000 Hz. pulses, but they are converting. The M-AXS has several programmable parameters that allow it to be configured to meet any requirements for pulse metering. The *Zoo Keeper*[®] software allows the programmer to set all of these parameters and then upload to the M-AXS.

Pulse Metering Parameters

Once in *Zoo Keeper*[®] click PROGRAM PROFILES, PARAMETERS, DIALING.

PULSE METER FREQ. This allows the programmer to choose the required Pulse Meter Frequency. There are two options to choose from 12,000 or 16,000 Hz. The default is 16,000 Hz.

PULSE METER SURCHARGE PAUSE This is the time after the pulses are to begin before the surcharge pulses are sent out. The default is 200 ms.

PULSE METER DURATION This is the length of time that the meter pulse is present on the line. The default is 100 ms.

Pulse Meter Tables

Once in *Zoo Keeper*[®] click TABLE EDITOR, enter the PASSWORD.

ENTRY TYPE Enter the letter M for the Metering Search Table.

ENTRY The digits that will be matched when an outgoing call is placed are entered here. They should be entered in the same manner as the Primary and Secondary Tables.

ACTION This is a two digit number that points to a specific entry number of the Pulse Meter Frequency/Surcharge Table, which defines the pulse meter rate.

Once in TABLE EDITOR, click the METERING RATE tab.

RATE This is the entry line number of the table that the above Search Table Action entry points to.

SURCHARGE This is the number of pulses to be output on the line as a surcharge.

INTERPULSE X 10 ms This is the time between the pulses.

Program Instructions

The program strings that require the metering pulses to be sent out require one change from the normal program structure. A new instruction 09 has been added. This instruction is the same as the 99, wait for hang up, but it also instructs the M-AXS to output the meter pulses according to the way it was configured with the Parameters and Tables above. Other small changes are required as well if answer supervision is going to be used to start the pulse metering. The M-AXS must be programmed to detect a predetermined signal from the callback switch before the meter pulses are output.

Program String Example

6405 573001 97 91 5830 97 90 5910 6000 75 51C15 97 93 95 09

TIME OF DAY / DAY OF WEEK PULSE METERING

In your regular Search Table enter all country codes as normal. In the Meter Rate Search Table you will need two entries for each country you wish to do Time of Day metering. One of the entries will contain a # and the other will just be the country code. Each entry will point to a different line in the Pulse Meter Rate Table.

A match in the primary table will cause a program to execute, which has as it's first instruction to test the time of day. If the time falls outside the parameters set by the 88 instruction the failure instruction will be executed which sends the call to a different program. After the destination number has been dialed, 6000, the instruction to insert a # with the 82 instruction is added to the program. This will change the number in the buffer that is being used to determine the pulse meter rate when the 09 instruction is executed. If digits are stripped before the destination number is dialed, such as the International Prefix, they must be added with the #. An example is below.

Primary Search Table

001 17

Metering Search Table

001 01 (peak hours pulse metering)

#001 02 (off hours pulse metering)

Meter rate Table

01 07 00222 (peak hours pulse metering)

02 05 00311 (off hours pulse metering)

Programs

17 8808001800 35196000 93 09

19 810103 6000 820104#001 93 09

If 001 is dialed a match is found in the search table and program 17 is executed. The first instruction in 17 is to check to see if the time is between 8 am and 6 pm. If the time is within these parameters 17 continues and the entry 001 of the metering search table is matched and line 01 of the meter rate table is used for the pulses.

If the time is outside the parameters the call goes to program 19. The first instruction after the destination number is dialed is to insert a # at the beginning of the collected number, as well as any digits that may have been removed before dialing the destination number, 820104#001. As the meter search table is searched the #001 entry is matched and the rate used is line 02.

The same method would be used for Day of the Week metering.

TIP AND RING REVERSAL APPLICATION NOTE

Tip and Ring Reversal is required for Call Accounting systems for billing purposes. Without the M-AXS the PTT sends a tip and ring reversal out on the line which is used by call accounting systems to start the billing upon answer of the called number. When Call back is used this reversal must be generated from something other than the PTT, as the actual answer supervision signal is sent to the callback switch from the destination number. The M-AXS has the ability to create this reversal at the appropriate time and then return the line back to the normal polarity, if required.

Program Instructions

The program strings that require the Tip and Ring Reversal require one change from the normal program structure. A new instruction 86X has been added. This instruction when added to a program string with the X value equal to 1 will perform the reversal and, if required, will reverse the polarity back if a second 86 instruction is added to the string with the X value equal to 0. Other small changes are required if answer supervision is going to be used to perform the reversal. The M-AXS must be programmed to detect a predetermined signal from the callback switch before the Tip and Ring Reversal is done.

Program String Examples

6405 573001 97 91 5830 97 90 5910 6000 75 51C15 97 861 93 95 99

6405 573001 97 91 5830 97 90 5910 6000 75 51C15 97 861 860 93 95 99

GLOSSARY

BUSY TONE -

the sound that is heard by a caller when a destination phone is busy

COUNTRY CODE -

the unique number that is dialed after the international prefix that indicates which country the user wishes to place a call to (North America is 1, France is 33)

DROP -

the person placing or receiving a telephone call (user)

DROP PROGRAM -

the set of instructions that are executed by the dialer when a user picks up the telephone handset to make a call

INTERNATIONAL PREFIX -

the number that a user must dial to indicate to the local telephone company that they wish to make an International call. Each country has a specific code for this. (in North America the prefix is 011)

OFF-HOOK State -

telephone receiver is picked up or speakerphone is turned on

ON - HOOK State -

telephone receiver is on telephone or speakerphone is turned off

PARALLEL PROGRAM -

the set of instructions that are executed by the dialer on the telco line, as a result of a search table match

PROGRAM MODE -

by dialing an access code, referred to as the Wake-Up Code, the dialer can be put into a state that enables a technician or programmer to modify the programs, tables or system parameters. While in Program Mode the dialer can not process any telephone calls.

PROGRAMMER MODE -

by dialing an access code from a communications program a dialer connected to a PC will be put into a state that enables a technician or programmer to program a remote dialer using the local dialers RS-232 data port. This port provides ASCII to DTMF and DTMF to ASCII conversion so that commands typed on the PC keyboard will be converted to DTMF tones to program the remote dialer and information from the remote dialer will converted to ASCII and displayed on the PC screen. Programmer Mode allows this conversion to take place and allows the flow of information to the remote dialer.

RING BACK -

the sound that is heard by a caller when a destination phone is ringing

RING PROGRAM -

the set of instructions that are executed by the dialer when an incoming call is detected

SEARCH TABLES -

when a user dials a telephone number a table of digits to match is searched (Primary and Secondary Table). The digit entry in the search table contains the number of the parallel program that the dialer should execute to place the call. The dialer contains a table for incoming call processing, (Incoming Table), should it be required.

SMDR -

Station Message Detail Recording - the call record produced by the dialer showing time of day, call duration, number dialed, line used and program used. This feature is activated by a 95 instruction and output through the dialer's RS-232 data port.

TRUNK -

telephone line provided by the local telephone company.

Zoo Keeper[®] -

Software package developed by Telcom Research used for programming and maintenance of the M-AXS and AXS dialers. Database records can be created saved and uploaded to dialers with the software.