V.3600
Manual

For Sales or Service Contact:

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Autodialer Command Strings and Parameters

Most command strings for the autodialer include two parts: the command itself and the parameters that follow. For the purposes of this chapter, parameters can be telephone numbers or anything appropriate to V.25 bis as described in the following text. Parameters are separated by semicolons.

For example:

```
PRN a; nnn . . . n
```

where a= the phone number address in memory and nnn . . . n= the phone number. The a and the nnn . . . n are both parameters. Not all commands have parameters. For example the CIC command has no parameter.

Software Guidelines

- An indicator enclosed in less than/greater than signs represents a specific character in the appropriate character set, ASCII or EBCDIC.

  `<sp> - space`

- Each response below is considered an individual message by V.25 bis conventions. For example, a dial command with *intermediate call progress* enabled (BISYNC mode ASCII/EBCDIC character set) is:

From computer	*To computer*
<sy><sy><stx>CRN<sp>(205)555-0124<etx>	<sy><sy><stx>VAL<etb>

- V.25 bis commands can be in one of these data formats:
  ASYNC
  BISYNC
  SDLC NRZ
  SDLC NRZI
  in ASCII or EBCDIC

Access these formats using:

&M	Asynchronous dial/asynchronous data
&M1	Asynchronous dial/synchronous data
&M2	Dials stored number when DTR off/on transition is detected/sync data
&M3	Manual dial/sync data
&M4	V.25 bis dialer/BISYNC protocol/sync data (ASCII)
&M5	V.25 bis dialer/SDLC protocol/sync data (NRZ)
&M6	V.25 bis async dial/sync data
&M7	V.25 bis async dial/async data
&M8	V.25 bis dialer w/BISYNC protocol/sync data (EBCDIC)
&M9	V.25 bis dialer w/SDLC protocol/sync data (EBCDIC) (NRZ)
&M10	V.25 bis dialer w/SDLC protocol/sync data (ASCII) (NRZI)
&M11	V.25 bis dialer w/SDLC protocol/sync data (EBCDIC) (NRZI)

- Separator fields depend on the data format.
  for ASYNC {sep} = command <CR>
  BISYNC {sep} = <sy><sy><stx> command <etx>
  SDLC {sep} = <Flags><Addr><ctl> command
  <FCS> *where:*
  <sy> = 16 hexadecimal
  <stx> = 02 hex
  <etx> = 03 hex
  <etb> = 17 hex
  <Flag> = 7E hex
  <Addr> = FF hex
  <ctl> = 13 hex (last frame), 03 hex (not last frame)
  <FCS> = Frame Check Sequence
  <CR> = Carriage Return

Invalid Responses

Except when stated otherwise, the following explanations for invalid INV responses apply:

INVCU Any transmission error (parity, framing, etc.).

INVMS This message has one of three possible meanings:

1) Receiving too many characters for any command.
2) Any command followed by a semicolon ;

INVPS This message has one of three possible meanings:

1) Any parameter set ending with a semicolon ;
   Any parameter set containing too many or not enough parameters; this includes any command:
   - entered without parameters that requires parameters
   - entered with parameters that does not require parameters
2) Any parameter containing too many characters.

INVPV This message has one of three meanings:

1) Any parameter set containing invalid characters
2) Any parameter or parameter set containing no valid (only ignored) characters
3) Any parameter set containing an out-of-range parameter

Dial Parameters

Table 11-1 lists and describes the parameters used in autodialing. The memory available for dialing can hold up to 40 characters. Parameters inserted for readability are not counted.

Table 11-1. Dial Parameters

Parameters	Function
0 thru 9	DTMF and pulse digit
* and #	DTMF digit
W	Wait for 2nd type of dial tone
>	Pause for 1 second
=	Pause for 3 seconds
<	Pause for programmed delay time
P	Pulse dialing
T	Tone dialing
&	Flash (go on hook) for ½ second
;	PARM separator
Space, dash, parenthesis, period	Parameters inserted for readability

V.25 bis Commands and Responses

The following sections describe the commands used with the V.25 bis autodialer and explain the responses received when each command is executed.

Dial Command — CRN nn...n

The dial command is a CRN followed by the number to be dialed nn . . . n. The modem accepts up to 40 dial parameters, excluding the CRN command and any leading spaces.

Responses:

VAL Valid command received. Transmitted on receiving an error-free command with no transmission error such as a parity error. This confirmation is sent before the command is executed.

INVCU Invalid command - command unknown.
Example: TRN (205)-555-0124

INVMS Invalid command - message syntax error.
Examples: CRN;(205)-555-0124
CRN; (semicolon invalid)

INVPS Invalid command - parameter syntax error.
Examples: CRN (205)-555-0124
CRN (205)-555;0124
CRN

INVPV Invalid command - parameter value error.
Examples: CRN (205)-555-012Q
CRN

CFIET Call failure - reorder or busy.

CFIRT Call failure - timeout occurred.

CFINT Call failure - no answer back tone.

CFIDT Call failure - no dial tone.

CFIAB Call failure - ABT detected but no carrier.

INC Incoming ring detected.

CFICB Call failure - delayed number list is full.

DLC;xxx Call failure - number is on delayed list and the call is delayed for xxx minutes.

Program Number Command — PRN a;nn...n

The program number command is PRN followed by the one digit decimal address a and the number to be stored nn . . . n. Each address can store up to 31 dial parameters. Ignored characters in the dial number are not stored. Nine stored numbers are available at addresses 1-9.

Responses:

Same as for the CRN command, except for call progress responses.

Intermediate Call Progress Response

The following response is given only if enabled. See Option Definition 002 below.

CNX@nnnnnBPS

where nnnnn is the line speed. This connect response appears after handshake completed, but before DSR is activated. This response is required if the intermediate call progress option is enabled.

Dial Stored Number — CRS a

The command for dialing a stored number is CRS followed by the one digit address *a* for the stored number to be dialed.

Responses:

Same as for the CRN command plus

CFINS Call failure - number not stored.

If the number is linked with other numbers via a PRL command, failure responses are returned as

{sep}a;{call progress messages} . . .

where *a* is the address dialed, followed by the separator field and call progress messages (CFI, etc.).

If the call fails to connect and the number is linked with other numbers, the autodialer tries to call the next number in the list of linked numbers.

Request List of Stored Numbers — RLN

The request list of stored numbers command is an RLN.

Responses:

INVCU Invalid command - command unknown.
Example: TLN

INVMS Invalid command - message syntax error.
Example: RLN;

If no number is stored at the specified address nothing is returned for that address. The separator {sep} is a

<etb><sy><sy><stx>LSN<sp>

sequence for BISYNC format (the last LSN string terminates with <etx> per V.25 bis). For synchronous bit-oriented operation, each LSN string is treated as an individual message per V.25 bis.

All stored numbers are sent to the DTE as

LSNa;nn...n{sep}a;nn...n...

where a is the stored number address and nn....n is the number stored.

Disregard Incoming Call — DIC

The command for disregarding an incoming call does not require parameters. If no call is incoming, the command is ignored.

Responses:

VAL Valid command received. Transmitted on receiving an error-free command with no transmission error such as a parity error. This confirmation is sent before the command is executed.

INVCU Invalid command - command unknown.
Example: TIC

INVMS Invalid command - message syntax error.
Example: SIC;

Connect Incoming Call — CIC

No parameters are required. If there is an incoming call, the modem immediately answers the call. If no call is incoming, the command is ignored.

Responses:

Same as for the DIC command!

Redial Last Number — CRR n

The CRR n command redials the last number a maximum of n times. If no parameters are present, the modem redials once. Also, the maximum number of redials, the amount of time between redials, and other parameters may vary depending on application and national requirements if outside the U. S.

Responses:

Same as for the CRS command.

Failure response is:

{sep}r;{call progress messages}...

where r is the recall count ($1 \leq r \leq n$; 1,2...,etc.), followed by a separator field and call progress messages (CFI XX, etc.). If the call fails to connect, this is repeated for the specified number of times.

Link Number by Address — PRL a;b

This command links the number at address a with the number at address b. The addresses are one digit decimal values. Linking numbers enables different numbers to be dialed if a call failure occurs.

Only forward linking to one other number is allowed, so address 1 can be linked to 4 to 8 to 9 etc.; however (using this example), if address 4 is dialed by a CRS command without connection it links forward to 8 then to 9.

If all these fail to connect, the autodialer will not back-link to address 1 unless circular linking is used. Numbers may be linked as 4 to 5 to 3; however, if address 3 is dialed, back-linking to 5 is not allowed.

If circular linking (1 to 8 to 7 to 1) is used, dialing is discontinued after the addressed number in the dial command has been dialed twice. If only one parameter follows the PRL command, the number at address a is unlinked from its forward link.

For example, if the link list 4 to 8 to 3 to 7 to 9 to 1 exists and PRL 7 is received, 7 would be unlinked from 9, but not from 3. This would result in two link lists: 4 to 8 to 3 to 7 and 9 to 1.

Responses:

VAL Valid command received. Transmitted on receiving an error-free command with no transmission error such as a parity error. This confirmation is sent before the command is executed.

INVCU Invalid command - command unknown.
Example: TRL 1;5

INVMS Invalid command - message syntax error.
Examples: PRL;1;5
PRL;

INVPS Invalid command - parameter syntax error.
Examples: PRL 1;5;
PRL 1;0;0
PRL 1;
PRL
PRL 001;5

INVPV Invalid command - parameter value error.
Examples: PRL 1;Q
PRL Q;1
PRL 1;45 where addresses 01-09 are defined

CFILD Call failure - no connection from link list.

Request List of Delayed Numbers — RLD

This command instructs the modem to send a list of delayed numbers to the DTE.

The modem cannot dial a number that is on the delayed call list until the prescribed time, or until power to the modem is turned off and then on again. A example list of delayed numbers is as follows:

RLD
LSD 1;5551212;D02001
LSD 2;5551414;D04059

If there is no response to the RLD command, there are no numbers on the delayed call list.

For numbers on the delayed call list, the response structure is as follows:
LSD a;bbbbbbb;Dxxyyy

Where:

a = delayed number list order
bbbbbbb = delayed telephone number
D = Delayed
xx = the number of failed call attempts made to the number
yyy = the number of minutes that calls to the number are delayed

Request List of Linked Numbers — RLL

The request list of linked numbers command is RLL with no parameters.

Responses:

INVCU Invalid command - command unknown.
Example: TLL

INVMS Invalid command - message syntax error.
Example: RLL;

LSL List linked numbers.

In all LSL examples, if no number is stored at the specified address no response is sent. The separator field for BISYNC is an

<etb><sp><sp><stx>LSL<sp>

The last LSL string ends with <etx> per V.25 bis. For synchronous bit oriented operation, each LSL string is treated as an individual message per V.25 bis. All linked numbers are sent to the DTE as

LSLa;l{sep}a;l

where a = stored address and l = link address.

Request List of Version — RLV

The request list of version information command is an RLV with no parameters:

Responses:

INVCU Invalid command - command unknown.
Example: TLV

INVMS Invalid command - message syntax error.
Example: RLV;

LSV List version

The version information is sent to the DTE as

LSV<sp>Sbbbbbbb00sccppddr / comment field

where bbbbbbb is the board number, s is the series number, cc is the controller code revision, pp is the data pump code revision, dd is the board dash number, and r is the printed circuit board revision followed by a comment field.

Modem Options Command — PRO xxx;yy;0;0...

The program options command is PRO followed by the starting register address (1 to 3 decimal digits), option count (1 or 2 decimal digits) and the data for each option (1 to 3 decimal digits per option). The "Options" section on page 11-15 lists available options with definitions, possible settings, and default values.

The modem must be able to accept 40 non-ignored characters besides the PRO command (leading zeros and semicolons are not considered ignored characters).

Responses:

VAL Valid command received. Transmitted on receiving an error-free command with no transmission error such as a parity error. This confirmation is sent before the command is executed.

INVCU Invalid command - command unknown.
Example: TRO 0;1;1

INVMS Invalid command - message syntax error.
Examples: `PRO;0;1;1`
`PRO;`

INVPS Invalid command - parameter syntax error.
Examples: `PRO 0;1;0;`
`PRO 0;1;1;1`
`PRO`
`PRO 0;001;1`

INVPV Invalid command - parameter value error.
Examples: `PRO 0;1;Q`
`PRO Q;1;1`
`PRO 0;0;0`
`PRO 68;1;0`

when option 68 is undefined for the modem.

INVPV<sp>xxx Invalid command - parameter value error.
Example: `PRO 10;5;0;0;0;2;1`

This invalid message can be returned when a block of options is being changed. The conditions for this invalid response are as follows:

- An undefined option number is specified. In the above example, if option 12 is undefined for a certain modem (and no other error conditions apply) options 10 and 11 would be changed as specified in the command message. The next option to be changed would be option 12. The modem would detect that this is an undefined option, stop execution of the command, and return an INVPV012 message. Options 10 and 11 would still be changed as commanded; options 13 and 14 would be unchanged.
- An out-of-range value for a particular option is specified In the above example, if the fourth value in the option string is undefined or out-of-range for option 13 in a certain modem (and no other error conditions apply), options 10 through 12 would be changed as specified in the command message. The next option to be changed would be option 13. The modem would then detect that the value is undefined or out-of-range for that option, stop execution of the command, and return an INVPV013 message Options 10 through 12 would still be changed as commanded; options 13 and 14 would be unchanged.

Save Current Settings — PRK

PRK saves the current option settings.

Responses:

VAL Valid command received. Transmitted on receiving an error-free command with no transmission error such as a parity error. Confirmation is sent before the command is executed.

INVCU Invalid command - command unknown.
Example: `TRK`

INVMS Invalid command - message syntax error.
Examples: `PRK;0`
`PRK Q`

Restore Factory Settings — PRP n

`PRP n` restores current option settings to factory option set `n` where `n` is a 1 digit decimal number.

Note
Restoring a factory option set other than factory option 9 disables the V.25 synchronous dialer.

If no parameter follows the command, the modem automatically selects factory option set 1.

Responses:

VAL Valid command received. Transmitted on receiving an error-free command with no transmission error such as a parity error. This confirmation is sent before the command is executed.

INVCU Invalid command - command unknown.
Example: `TRP`

INVMS Invalid command - message syntax error.
Examples: `PRP;1`
`PRP Q`

INVPS Invalid command - parameter syntax error.
Examples: PRP 1;
PRP 1;1
PRP 001

INVPV Invalid command - parameter value error.
Example: PRP 5

where factory default 5 is not defined for the modem. Current modem factory options are 1-9.

Request List of Stored Options — RLO xxx; yy

The request list of stored options command is RLO followed by an optional 1 to 3 digit decimal address and a 1 or 2 digit decimal count. The "Options" section on page 11-15 lists all available options with definitions, possible settings, and default values.

Responses:

INVCU Invalid command - command unknown.
Example: TLO 0;1

INVMS Invalid command - message syntax error.
Examples: RLO;0;1
RLO Q;1

INVPS Invalid command - parameter syntax error.
Examples: RLO 0;1;
RLO 0;1;4
RLO 0;001

INVPV Invalid command - parameter value error.
Examples: RLO 0;Q
RLO 0;0
RLO999;45

LSO List stored options.

The separator {sep} for BISYNC is an

<etb><sp><sp><stx>LSO<sp>

sequence for the sync format (the last LSO string terminates with <etx> per V.25 bis). For synchronous bit oriented operation, each LSO string is treated as an individual message per V.25 bis.

If no parameters follow, all stored options are sent to the DTE as

LSOxxx;ooo{sep}xxx;ooo...

Each value must be padded with leading zeros so that each field has three characters. Option zero would be sent as

LSO000;000

If only an address follows the command, the single requested option is sent to the DTE as

LSOxxx;ooo

If address and count follow the command, the requested count of options starting with the specified address are sent to the DTE as

LSOxxx;ooo{sep}xxx;ooo...

Options

You can change the options for the V.25 bis autodialer using the PRO command or list them using the RLO command. Options are listed in Table 11-2.

Table 11-2. V.25 Autodialer Options

Option	Definition	Settings	Default
002:	Intermediate call progress messages	0 - Disable 1 - Enable	0
003:	Blind dial	0 - Disable 1 - Enable	0
007:	Long space disconnect	0 - Disable 1 - Enable	1

Table 11-2. V.25 Autodialer Options (Continued)

Option	Definition	Settings	Default
051:	Primary transmit / receive rate	007: 1200 bps 008: 2400 bps 034: 4800 bps 035: 9600 bps uncoded 036: 9600 bps 046: 7200 bps 047: 12,000 bps 048: 14,400 bps 049: 16,800 bps 050: 19,200 bps 051: 21,600 bps 052: 24,000 bps 053: 26,400 bps 054: 28,800 bps 055: 31,200 bps 056: 33,600 bps	54 (28800 bps)
055:	Transmit clock	0 - Internal 1 - External 2 - Receive (slave)	0
063:	Autoanswer	0 - Disable 1 - Enable (answer after 1 to 255 rings)	0
064:	Line current disconnect	0 - Off 1 - Short (8 ms) 2 - Long (90 ms)	2
076:	Speaker control	0 - Off 1 - On 4 - On until CD 6 - Off when dialing	4
077:	Speaker volume	0 - Low 1 - Medium 2 - High	1
085:	Constant carrier RTS/CTS delay	0 to 250 ms 10 ms increments	0
087:	DTR dropout timer DTR must turn off for this length of time to be recognized.	0 to 255 in 10 ms increments	5 (50 ms)
089:	Pause in dial string	0 - Invalid 1 to 255 seconds	2
090:	Carriage return character	ASCII or EBCDIC character range	13 dec

Table 11-2. V.25 Autodialer Options (Continued)

Option	Definition	Settings	Default
091:	Line feed character	ASCII or EBCDIC character range	10 dec ASCII; 37 dec EBCDIC
092:	Guard tone	0 = None 1 = 550 Hz 2 = 1800 Hz	0
093:	Carrier detect delay	0 - Off; 1 to 255 10 ms increments	6 (60 ms)
094:	Loss of carrier disconnect	0 - Off 1 to 255 100 ms increments	14 (1.4 sec)
095:	DTR dial address - Stored telephone number address to dial on DTR off-to-on transition		1
096:	DTR dial	0 - Disable 1 - Enable	0
098:	Call timeout	0 - Off 1-255 sec	30 sec
103:	Signal quality retrain	0 - Disable 1 - Send training sequence on poor quality	1
111:	Modulation mode	000: Automode 001: V.21 002: B103 005: V.22 006: V.22 bis 007: V.27 ter 009: V.29 012: V.32 bis 013: V.34	
112	V.34 Select Threshold	000: Low 001: Medium 002: High	
113	V.34 Asymmetric bit rates	000: Disabled 001: Enabled	

Table 11-2. V.25 Autodialer Options (Continued)

Option	Definition	Settings	Default
903:	Bilateral loop - If enabled and a test is commanded, bilateral loop is defined as follows: **Test Bilateral CommandedLoop** Loop 1 Loop 2 Loop 2 Loop 1 Loop 3 Loop 4 Loop 4 Loop 3 Loop definitions per CCITT V.54.	0 - Disabled 1 - Enabled	0
904:	Computer commanded remote digital loopback	0 - Disable 1 - Enable	0
905:	Computer commanded local analog loopback	0 - Disable 1 - Enable	0
906:	Remote commanded test	0 - Disable 1 - Enable	1
907:	Test timer	0 - Until DTR drops TTT - 1 to 255 sec	0

Chapter 12 Maintenance

Warning

Disconnect power before performing maintenance. Although dangerous voltage levels are not exposed, disconnecting power ensures that no electric shock hazard is present.

General

The modem contains no internal electronic components that can be serviced or replaced by the user. Repairs should not be attempted by the user.

Fuse Replacement

Warning

If a fuse fails, replace it with one of an equal type and rating. Repeated failure indicates a more serious problem.

Maintenance

The modem provides maintenance-free service. Periodically it is advisable to remove dust that has collected on internal components. If attempting to clean the modem, remove dust with a soft bristle brush and low pressure air or vacuum.

Before attempting diagnostic tests, verify that all connectors and plugs are firmly inserted. The test procedures identify the faulty component in a bad communications link.

Calling Technical Support

The Service and Support page at the back of this User's Guide contains several phone and faxback numbers and the Web address. If calling Technical Support, please call from a location near the computer with the modem. It helps expedite the call to have the following information available:

- Type of modem -- V.3600
- Modem serial number
- Date code
- Purchase date
- Type and version of software, including data communications, fax, and browser/reader software
- Type and version of other software running at the same time

Note
Do not return the modem to the manufacturer without prior authorization.

If the unit appears faulty, contact Motorola Technical Support at 1-800-544-0062 (USA) for service and assistance.

Appendix A Specifications

Size

Width	7.0 inches (17.78 cm)
Depth	10.5 inches (26.67 cm)
Height	2.25 inches (5.72 cm)
Weight	2 lbs. 13 oz. (1.28 kg)
Front Panel	32 ASCII character LCD

Environmental Conditions

Temperature:

Operation	+32° F to +122° F (0° C to +50° C)
Storage	-40° F to +158° F (-40° C to +70° C)
Humidity:	0 to 95% relative humidity, noncondensing

Power Requirements

The modem can be ordered for operation with one of three power input options.

- 115 VAC ±10%; 50-60 Hz
- 230 VAC ±10%; 50–60 Hz
- 12 to 60 VDC

Power consumption: 14 watts

Telephone Line

Balanced 600 ohm type 3002 or equivalent 16 dB nominal loss, frequency translation up to ±10 Hz

Digital Interface

Conforms to EIA-232D and CCITT V.24