1 AXB-232+ Smart RS-232 Interface Box

1.1 CHANNELS

CHANNEL	FUNCTION
255	Reflects the state of the CTS input if a 'CTSPSH' command was sent to the AXB-232+.

1.2 COMMANDS

(SEND_COMMAND DEV,"command")

```
'B9MON' enables a special 9 data bits with 1 stop bit mode which
   overrides the DIP switch settings for number of data, stop,
   and parity bits.  The baud rate is locked on at the current
   DIP switch setting on issuance of this command
'B9MOFF' (default) sets data bits mode to normal with DIP switch
   setting
'BAUDHIGH' enables 115.2k baud rate when the dip switch is set to 300
   baud settings. (added v2.13)
'BAUDLOW' (default) sets the baud rate to 300 baud when the dip switch
   is set to 300 baud settings. (added v2.13)
'CB1ON' (default) Enable placement of characters in the buffer
   specified in the CREATE_BUFFER 1,buffer statement.
'CB1OFF' Disable placement of characters in the buffer specified
   in the CREATE_BUFFER 1,buffer statement.
'CHARD-<time in 100 microsecond increments 0-255>' sets delay
   between all transmitted characters to that specified.

      Example of usage:
        'CHARD-10' sets 1mS delay between all transmitted characters

'CTSPSH' enables PUSHes and RELEASEs and status on channel 255
   ([0,255] within the AXB-232+) for CTS hardware handshake
   input.  If CTS is high, then channel is on.
'EOFF' (default) disable 'EON' command above.
'EON' This command will cause the card to ignore transmitted
   characters on its receiver.  When using RS485, the
   transmitter and receiver are tied together-this command
   forces the card to ignore the characters being received from
   the transmitter.
'HSOFF' (default) hardware handshaking disabled.
'HSON' enable hardware handshaking.
'RXOFF' (default) AXB-232+ will not pass on received characters
   to Master
'RXON' enables AXB-232+ to send incoming received characters to
   Master.  This command is automatically sent by Master when a
   'CREATE_BUFFER' program instruction is executed
'RXCLR' any characters waiting in the receive buffer waiting to
   be sent to Master will be cleared
'TXCLR' any characters waiting in the transmit out buffer will
   be cleared and transmission will stop
'TXTO-<time in 100 millisecond increments>' The power-up default
   for this is 50 (i.e.  5 seconds).  This sets the timeout for
   characters that are being transmitted out the RS232/422/485
```

port. When the transmit buffer becomes full, the AXB-232+ will wait up to the specifed time before giving up trying to transmit a character. The time-out is implemented only when handshaking is used and the transmitter can not transmit or the baud rate is so slow that the transmit buffer becomes full when trying to send long strings.

'XOFF' (default) software handshaking disabled.
'XON' enable software handshaking.
'ZAP!' Clears AXCESS program in AXB-232+.

SEND_STRINGs:

This devices also has some special SEND_STRING escape sequences:

If any of the 3 character combinations below are found anywhere within a SEND_STRING program instruction, they will be treated as a command and not the literal characters:

* "27,17,<time in 100 microsecond increments 1-255>" sends a break character of the specified length of time
* "27,18,1" sets the 9th data bit to 1 for all subsequent characters to be transmitted. Used in conjunction with the 'B9MON' command
* "27,18,0" clears the 9th data bit to 0 for all subsequent characters to be transmitted. Used in conjunction with the 'B9MON' command
* "27,19,<time in 1 millisecond increments 1-255>" inserts a delay before the next character to be transmitted
* "27,20,0" un-asserts RTS hardware handshake output high
* "27,20,1" asserts RTS hardware handshake output low

---

2 AXB-232++ Smart RS-232 Interface Box

2.1 CHANNELS

CHANNEL	FUNCTION
254	This is only valid within the device and is not sent to the AXLink master. It indicates the status of AXLink. This channel is ON if AXLink is active otherwise the channel is OFF.
Channel	Function
255	Reflects the state of the CTS input if a 'CTSPSH' command was sent to the AXB-232+.

2.2 COMMANDS

(SEND_COMMAND DEV,"command")

```
'B9MON' enables a special 9 data bits with 1 stop bit mode which
   overrides the DIP switch settings for number of data, stop,
   and parity bits.  The baud rate is locked on at the current
   DIP switch setting on issuance of this command
'B9MOFF' (default) sets data bits mode to normal with DIP switch
   setting
'BAUDHIGH' enables 115.2k baud rate when the dip switch is set to 300
   baud settings. (added v2.13)
'BAUDMED' enables 57.6k baud rate when the dip switch is set to 300
   baud settings. (added v3.02)
'BAUDLOW' (default) sets the baud rate to 300 baud when the dip switch
   is set to 300 baud settings. (added v2.13)
'CB1ON' (default) Enable placement of characters in the buffer
   specified in the CREATE_BUFFER 1,buffer statement.
'CB1OFF' Disable placement of characters in the buffer specified
   in the CREATE_BUFFER 1,buffer statement.
'CHARD-<time in 100 microsecond increments 0-255>' sets delay
   between all transmitted characters to that specified.

      Example of usage:
        'CHARD-10' sets 1mS delay between all transmitted characters

'CTSPSH' enables PUSHes and RELEASEs and status on channel 255
   ([0,255] within the AXB-232++) for CTS hardware handshake
   input.  If CTS is high, then channel is on.
'CTSPSHF' disables CTSPSH (See above).  (added V3.04)
'EOFF' (default) disable 'EON' command above.
'EON' This command will cause the card to ignore transmitted
   characters on its receiver.  When using RS485, the
   transmitter and receiver are tied together-this command
   forces the card to ignore the characters being received from
   the transmitter.
'HSOFF' (default) hardware handshaking disabled.
'HSON' enable hardware handshaking.
'RXOFF' (default) AXB-232++ will not pass on received characters
   to Master
'RXON' enables AXB-232++ to send incoming received characters to
   Master.  This command is automatically sent by Master when a
   'CREATE_BUFFER' program instruction is executed
'RXCLR' any characters waiting in the receive buffer waiting to
```

```
   be sent to Master will be cleared
'TXCLR' any characters waiting in the transmit out buffer will
   be cleared and transmission will stop
'XOFF' (default) software handshaking disabled.
'XON' enable software handshaking.
'ZAP!'  Clears AXCESS program in AXB-232++.

**************************************
Added 1999-05-14 for v5.000
XMODEM TIMING COMMANDS

   XMODEM TIMEOUTS (default is 10sec):
   1. Via the Program Port: 'TIMEOUT XX'
   2. Over AXlink:          SEND_COMMAND SERIAL,'TIMEOUT XX'
   Where XX is from 1 to 50 seconds in 1-second increments.
   Note that any of the above will change timing
   for AXcess code download as well as Softrom transfer.

   XMODEM RETRIES (default is 5):
   1. Via the Program Port: 'RETRY XX'
   2. Over AXlink:          SEND_COMMAND SERIAL,'RETRY XX'
   Where XX is from 1 to 10 in increments of 1.
   Note that any of the above will change number or retries
   for AXcess code download as well as Softrom transfer.
```

SEND_STRINGs:

This devices also has some special SEND_STRING escape sequences:

If any of the 3 character combinations below are found anywhere within a SEND_STRING program instruction, they will be treated as a command and not the literal characters:

* "27,17,<time in 100 microsecond increments 1-255>" sends a break character of the specified length of time
* "27,18,1" sets the 9th data bit to 1 for all subsequent characters to be transmitted. Used in conjunction with the 'B9MON' command
* "27,18,0" clears the 9th data bit to 0 for all subsequent characters to be transmitted. Used in conjunction with the 'B9MON' command
* "27,19,<time in 1 millisecond increments 1-255>" inserts a delay before the next character to be transmitted
* "27,20,0" un-asserts RTS hardware handshake output high
* "27,20,1" asserts RTS hardware handshake output low

3 AXB-CAM Camera Controller

3.1 CHANNELS

CHANNEL	FUNCTION
1	While On, Ramps PAN low current output up at current rate.
2	While On, Ramps TILT low current output up at current rate.
3	While On, Ramps ZOOM low current output up at current rate.
4	While On, Ramps FOCUS low current output up at current rate.
5	While On, Ramps PAN low current output down at current rate.
6	While On, Ramps TILT low current output down at current rate.
7	While On, Ramps ZOOM low current output down at current rate.
8	While On, Ramps FOCUS low current output down at current rate.
10	While On, PAN voltage level is set to 255 (100%). While Off, PAN voltage level is set back to center.
11	While On, TILT voltage level is set to 255 (100%). While Off, TILT voltage level is set back to center.
12	While On, ZOOM voltage level is set to 255 (100%). While Off, ZOOM voltage level is set back to center.
13	While On, FOCUS voltage level is set to 255 (100%). While Off, FOCUS voltage level is set back to center.
14	While On, PAN voltage level is set to 0 (0%). While Off, PAN voltage level is set back to center.
15	While On, TILT voltage level is set to 0 (0%). While Off, TILT voltage level is set back to center.
16	While On, ZOOM voltage level is set to 0 (0%). While Off, ZOOM voltage level is set back to center.
17	While On, FOCUS voltage level is set to 0 (0%). While Off, FOCUS voltage level is set back to center.
18	While On, PAN voltage level is set to 192 (75%). While Off, PAN voltage level is set back to center.
19	While On, TILT voltage level is set to 192 (75%). While Off, TILT voltage level is set back to center.
20	While On, ZOOM voltage level is set to 192 (75%). While Off, ZOOM voltage level is set back to center.
21	While On, FOCUS voltage level is set to 192 (75%). While Off, FOCUS voltage level is set back to center.
22	While On, PAN voltage level is set to 64 (25%). While Off, PAN voltage level is set back to center.
23	While On, TILT voltage level is set to 64 (25%). While Off, TILT voltage level is set back to center.
24	While On, ZOOM voltage level is set to 64 (25%). While Off, ZOOM voltage level is set back to center.
25	While On, FOCUS voltage level is set to 64 (25%). While Off, FOCUS voltage level is set back to center.
31	While On, PAN High Current pans right at current speed.
32	While On, TILT High Current tilts down at current speed.
35	While On, PAN High Current pans left at current speed.
36	While On, TILT High Current tilts up at current speed.
40	While On, PAN High Current pans right at max speed (100%).
41	While On, PAN High Current pans left at max speed (100%).
42	While On, TILT High Current tilts down at max speed (100%).
43	While On, TILT High Current tilts up at max speed (100%).
44	While On, PAN High Current pans right at 50% speed.
45	While On, PAN High Current pans left at 50% speed.
46	While On, TILT High Current tilts down at 50% speed.

47 While On, TILT High Current tilts up at 50% speed.

50 While On, PAN (low current or high current) is seeking pot preset. (Status Only)
51 While On, TILT (low current or high current) is seeking pot preset. (Status Only)
52 While On, ZOOM (low current) is seeking pot preset. (Status Only)
53 While On, FOCUS (low current) is seeking pot preset. (Status Only)

101-228 While On, Recalls preset 1 to 128. Will be turned off if another preset is selected of a command is sent to move an output.

Levels:

Axcess Levels	Level
1	PAN
2	TILT
3	ZOOM
4	FOCUS
5	PAN_POT
6	TILT_POT
7	ZOOM_POT
8	FOCUS_POT

3.2 COMMANDS

Low current Commands (SEND_COMMAND DEV,"command")

Parameters:

Outputs:	1 PAN 2 TILT 3 ZOOM 4 FOCUS
Level:	0 (lowest) to 255 (highest) or 0% to 100%
Time: (Optional)	If specified 0 to 255 in tenth seconds If not specified, at current rate.
Position:	0 to 255. Value of potentiometer input. Corresponds to a position of the unit. 0 is one end of the potentiometer and 255 is the other end. Not directly related to an output level voltage. 0 to 65535 when using the 'AD MODE x 10' command. Corresponds to a position of the unit. 0 is one end of the potentiometer and 65535 is the other end. Not directly related to an output level voltage.
Speed:	0 to 127. 0 is slowest and 127 if fastest. 127 is default.

Deviation: 0 to 127. 0 is most accurate but can have some jitter. Default is 2, i.e. the position can be within +/- 2 from the specified position.

Distance: 0 to 127. Distance from the specified position.

'AD MODE <output 1-4> 8'

Sets the AD reported 8 bit levels. This is the default value. (Added v1.02)

Examples:

SEND_COMMAND CAM,'AD MODE 4 8' Sets the FOCUS Pot input to 8 bit level reporting (0-255).

'AD MODE <output 1-4> 10'

Sets the AD reported 10 bit levels extended to 16 bits. (Added v1.02)

Examples:

SEND_COMMAND CAM,'AD MODE 4 10' Sets the FOCUS Pot input to 10 bit level reporting (0-65535).

'P<output 1-4>L<level 0-255|0-100%>[T<time 0-255 in tenth seconds]'

Ramps specified output from current level to a specified level or percentage at the current rate or optionally in a specified amount of time.

Examples:

SEND_COMMAND CAM,'P1L50%' Ramps PAN output to 50% (mid voltage) at current rate.
SEND_COMMAND CAM,'P4L255T30' Ramps FOCUS output to 255 (highest voltage) in 3 seconds.

'P<output 1-4>R<time 1-255 in tenth seconds>[U|D]'

Sets the ramp rate of the specified output where time is the time to ramp the full range both down to up and up to down or optionally just down to up or just up to down.

Examples:

SEND_COMMAND CAM,'P1R50' Sets PAN ramp rate to 5 seconds full range for down to up and up to down.

SEND_COMMAND CAM,'P2R75U' Sets TILT ramp rate to 7.5 seconds full range for down to up only.

SEND_COMMAND CAM,'P3R25D' Sets ZOOM ramp rate to 2.5 seconds full

range for up to down only.

'G<output 1-4>L<position 0-255 or 0-65535>'

Turns on the specified output at the current speed (voltage) until the specified position as read by the pot input is reached. Commands forces output to go to a preset position using the pot input as a reference. (Positions 0-65535 are available using the 'AD MODE x 10' command that was added in v1.02)

Examples:

SEND_COMMAND CAM,'G1L100' Sets PAN to search for position 100 as referenced by the PAN pot input.

'G<output 1-4>S<speed 0-127>'

Sets the current speed (voltage) for future positional ('GXLXXX') commands.

Examples:

SEND_COMMAND CAM,'G1S64' Sets PAN to speed 64 (50%) for future 'G1LXXX' commands.

'G<output 1-4>D<deviation 0-127>'

Sets the current maximum position deviation for future positional ('GXLXXX') commands.

Examples:

SEND_COMMAND CAM,'G1D4' Sets PAN deviation to 4 for future 'G1LXXX' commands. Output will stop when it is within 4 of the specified position.

'G<output 1-4>A<distance 0-127>S<speed 0-127>'

Sets the output to slow down within the specified distance of the specified position for future 'GXLXXX' commands.

Examples:

SEND_COMMAND CAM,'G1A5S20' Sets PAN to speed 20 when within 5 of the specified position for future 'GXLXXX' commands.

High Current Commands

Parameters:

Outputs:	1	PAN
	2	TILT
Position:	0 to 65535. Value of potentiometer input.	

	Corresponds to a position of the unit. 0 is one end of the potentiometer and 65535 is the other end. Not directly related to an output level voltage.
Speed:	0 to 127. 0 is slowest and 127 if fastest. 127 is default.
Deviation:	0 to 127. 0 is most accurate but can have some jitter. Default is 2, i.e. the position can be within +/- 2 from the specified position.
Distance:	0 to 127. Distance from the specified position.

'G<output 1-2>L<position 0-65535>'

Turns on the specified output at the current speed (voltage) until the specified position as read by the pot input is reached. Commands forces output to go to a preset position using the pot input as a reference.

Examples:

```
SEND_COMMAND CAM,'G1L32000' Sets PAN to search for position 32000
                             as referenced by the PAN pot input.
```

'G<output 1-2>S<speed 0-127>'

Sets the current speed (voltage) for future positional ('GXLXXX') commands.

Examples:

```
SEND_COMMAND CAM,'G1S64'   Sets PAN to speed 64 (50%) for future
                           'G1LXXX' commands.
```

'G<output 1-2>D<deviation 0-127>'

Sets the current maximum position deviation for future positional ('GXLXXX') commands.

Examples:

```
SEND_COMMAND CAM,'G1D4'   Sets PAN deviation to 4 for future
                          'G1LXXX' commands. Output will stop
                          when it is within 4 of the specified
                          position.
```

'G<output 1-2>A<distance 0-127>S<speed 0-127>'

Sets the output to slow down within the specified distance of the specified position for future 'GXLXXX' commands.

Examples:

SEND_COMMAND CAM,'G1A5S20' Sets PAN to speed 20 when within 5 of the specified position for future 'GXLXXX' commands.

********** Note **********

PAN and TILT Low Current and High Current share the same POT inputs internally to the AXB-CAM, even though there are different input pins. They cannot both be used with pot inputs simultaneously. The configuration dip switch sets whether low current or high current sections should be used with the PAN/TILT pot inputs. Any 'G<1-2>LXXX' command while use the appropriate output depending on the configuration dip switch setting.

The outputs themselves can still be independently controlled as long as the output positions are not referenced to the POT inputs. If the PAN/TILT configuration switch setting is set to HIGH CURRENT, the LOW CURRENT outputs can still be controlled by Channels and 'P<1-2>LXXX' commands. If the PAN/TILT configuration switch setting is set to LOW CURRENT, the HIGH CURRENT outputs can still be controlled by Channels.

****

Preset Commands

Parameters:

Preset:	1 - XXX
Time: (Optional)	If specified 0 to 255 in tenth seconds If not specified, at current rate. Used for low current outputs. Used for Recall Preset only.
Speed: (Optional)	0 to 127. 0 is slowest and 127 if fastest. If not specified, at current speed. Used for high current outputs. Used for Recall Preset only.
Defines: (Optional)	List of output and/or inputs to include in preset. Any output/input code listed will be recorded and will be changed when a preset is recalled. Parameters included will determine which type or preset used for low current channels. If the POT input position is defined, the preset will use 'GXLXXX' speed preset. If the output level is defined, the preset will be used 'PXLXXX' position preset. If not specified, the configuration dip settings for preset recall modes (speed/position) will determine preset method used.
Output Codes:	P PAN Low current output level. T TILT Low current output level. Z ZOOM Low current output level.

	F	TILT Low current output level.
Input Codes:	PP	PAN POT input position. (Config dip sets High Current or Low Current use).
	TP	TILT POT input position. (Config dip sets High Current or Low Current use).
	ZP	ZOOM POT input position. Low Current.
	FP	FOCUS POT input position. Low Current.

Codes are listed in no specific order and must be separated.

'SP<preset 1-X>[D<defined list>]' Store Preset.

Stores the current outputs and inputs for preset recalls. Defined list contains inclusions to preset. Listed items must be separated (comma, space, dash etc.).

Examples:

SEND_COMMAND CAM,'SP1'

Stores current levels for PAN, TILT, ZOOM, FOCUS outputs and PAN, TILT, ZOOM, FOCUS POT inputs to preset 1. The configuration dip settings for preset recall modes (speed/position) will determine preset method used.

SEND_COMMAND CAM,'SP1D-P,T,Z,F'

Stores current levels for PAN, TILT, ZOOM, FOCUS outputs to preset 1. Preset recall will use position preset 'PXLXXX'.

SEND_COMMAND CAM,'SP10D-PP,TP,ZP,FP'

Stores current positions for PAN, TILT, ZOOM, FOCUS POT inputs to preset 10. Preset recall will use speed preset 'GXLXXX'.

SEND_COMMAND CAM,'SP5D-PP,TP,Z,F'

Stores current positions for PAN and TILT POT inputs, and ZOOM and FOCUS outputs to preset 5. Preset recall will use speed preset 'GXLXXX' for PAN/TILT and position preset 'PXLXXX' for ZOOM/FOCUS preset.

'RP<preset 1-X>[T<time 0-255 in tenth seconds>][S<speed 0-127>]'

Recalls a stored preset. Optional parameters include ramp time for low current outputs and speed for high current outputs.

Examples:

SEND_COMMAND CAM,'RP1'

Recalls preset 1. Same as turning on channel 101.
Turns on channel 101.

```
SEND_COMMAND CAM,'RP10T100'
```

Recalls preset 10. Low current outputs will ramp to position in 10 seconds. High current outputs will use current speed. Turns on channel 110.

```
SEND_COMMAND CAM,'RP5S64'
```

Recalls preset 5. Low current outputs will ramp to position at default rate. High current outputs will use speed of 64. Turns on channel 105.

```
SEND_COMMAND CAM,'RP2T50S32'
```

Recalls preset 2. Low current outputs will ramp to position in 5 seconds. High current outputs will use speed of 32. Turns on channel 102.

********** Note **********

PAN and TILT Low Current and High Current presets can be mixed. If the configuration dip switch is set for HIGH CURRENT, the Pan Pot (PP) and Tilt Pot (TP) parameters will store a HIGH CURRENT speed preset 'GXLXXX'. If the Pan (P) and Tilt (T) parameters are also listed, the LOW CURRENT outputs will store a position preset 'PXLXXX'.

If no Defines are listed, the configuration dip switch sets the preset recall methods. If HIGH CURRENT is selected and the PAN/TILT PRESET is set for position mode, a store preset will store the PAN/TILT POT values for the HIGH CURRENT outputs and the PAN/TILT low current output levels will be stored.

****

Standalone RS232 protocol.

The standalone RS232 protocol is the AXB-PCCOM protocol. The only difference is that the the device byte of the protocol is fixed at 0.

AXB-CAM CONTROL PROTOCOL

```
GENERAL FORMAT:
BYTE #
  1    ATTENTION BYTE
  2    COMMAND #
  3    DATA
LAST   CHECKSUM, SUM OF ALL BYTES MOD 256
```

****

REQUESTS SENT TO AXB-CAM

```
      Note - Valid <LEVEL NO> are 0-7.
      RS232 Levels            Level
      -------------           ---------
            0                 PAN
            1                 TILT
            2                 ZOOM
            3                 FOCUS
            4                 PAN_POT
            5                 TILT_POT
            6                 ZOOM_POT
            7                 FOCUS_POT


 Channel On/Off       '*' <1>  <0> <CHANNEL> <STATUS> <CHECKSUM>
                                status 1 -> turn on channel
                                status 0 -> turn off channel
 SET LEVEL (byte)     '*' <3>  <0> <LEVEL NO> <LEVEL> <CHECKSUM>
 SEND STRING          '*' <4>  <0> <# BYTES> <STRING> <CHECKSUM>
 SEND COMMAND         '*' <5>  <0> <# BYTES> <STRING> <CHECKSUM>
 GET CHANNEL STATUS   '*' <6>  <0> <CHANNEL> <CHECKSUM>
 GET LEVEL STATUS     '*' <7>  <0> <LEVEL> <CHECKSUM>
 GET BUSS STATUS      '*' <8>  <CHECKSUM>
 GET DEVICE(s)        '*' <9>  <CHECKSUM>
 SET RESPONSE MASK    '*' <10> <MASK1> <MASK2> <CHECKSUM>
 SEND ALL ON CHANNELS '*' <11> <0> <CHECKSUM>
 SEND ALL LEVELS      '*' <12> <0> <CHECKSUM>
 SET LEVEL (word)     '*' <13> <0> <LEVEL NO><LEVEL_H><LEVEL_L><CHECKSUM>

  ************************************************************************
 RETURN/RESPOND STRINGS FROM AXB-CAM:
       Note -  Valid <LEVEL NO> are 0-7.

 CHANNEL STATUS        '&' <1> <0> <CHANNEL> <STATUS> <CHECKSUM>
                               status 1 -> turn on channel
                               status 0 -> turn off channel
 CHANGE LEVEL(byte)    '&' <2> <0> <LEVEL NO> <LEVEL> <CHECKSUM>
 RECEIVE STRING        '&' <3> <0> <# BYTES> <STRING> <CHECKSUM>
 RECEIVE COMMAND       '&' <4> <0> <# BYTES> <STRING> <CHECKSUM>
 BUSS LED STATUS       '&' <5> <STATUS> <CHECKSUM>
 BUSS STATUS           '&' <6> <STATUS> <CHECKSUM>
    When AXLink is reset, BUSS STATUS is sent without being queried,
    When AXLink goes back on-line, BUSS STATUS is sent again.
 DEVICE LIST           '&' <7> <# DEVICES> <DEVICES> <CHECKSUM>
 CHANGE LEVEL(word)    '&' <8> <0> <LEVEL NO> <LEVEL_H> <LEVEL_L> <CHECKSUM>
  ************************************************************************
RESPONSE MASK
DATA is automatically sent if the AXB-CAM gets a change.
This can be disabled and should be if the data is not used.
Bits in the response mask will turn off data
 (1=ON)   DATA SENT
 (0=OFF)  DATA NOT SENT
 NOTE: BUSS LED CHANGE DEFAULTS TO OFF

BIT      DATA CONTROLLED      DEFAULT
1st BYTE (MASK1)
 7 (msb) RECEIVE STRING        1
 6       RECEIVE COMMAND       1
```

```
  5       CHANNEL CHANGE        1
  4       LEVEL CHANGE          1
  3       BUSS LED              0
  2       (future)              0
  1       (future)              0
  0 (lsb) (future)              0
 2nd BYTE (MASK2)
  7 (msb) (future)              0
  6       (future)              0
  5       (future)              0
  4       (future)              0
  3       (future)              0
  2       (future)              0
  1       (future)              0
  0 (lsb) (future)              0
```

---

4 AXB-DMX512 DMX512 INTERFACE

4.1 CHANNELS

CHANNEL	DESCRIPTION
1-8	AMX Level 1-8 Ramp UP
9-16	AMX Level 1-8 Ramp DOWN
17-112	Group 1-96 Ramp UP
113-208	Group 1-96 Ramp DOWN
209-248	Programable DMX Input trigger

AXB-DMX512 Specifications

DEFINITIONS

{}	Parameters in commands that are optional.
AMX Level	<1-8> The 8 levels that tie to the Axcess systems.
Actual DMX Output	The value that is the highest of the three buffers. This is the value that is actually transmitted out the DMX port. Also refered to as a Dimmer.
Buffers	There are three Output buffers whatever value is highest in any buffer is output the DMX port. They are the Patch, Group, and Direct Control Buffers. Each is accessed in a different way
DMX Input	< 1-512> The actual DMX inbound data it is stored in the DMX Input Buffer
DMX Output	< 1-512> There are 3 buffers that hold 512 values each. They are the Patch,Group,Direct buffers. There are commands for each.
Group	< 1-96> The group of DMX Output that act together.Outputs can only belong to one group.
Level	<0-255 or 0-100 %> The value can be given in actual steps 0-255 or given as a percentage 0-100%
List of Outputs	<1,2,3,5-10> a list of single DMX channel(s) with range(s) of DMX channels.
Patch	Connect in DMX Input to a DMX Output
Preset	<1-64> A snapshot of the Current values of the DMX Outputs contained in the Snapshot Group. The current Snapshot Group will also be stored. Recalls of a Snapshot only adjust the channels that were in the Snapshot group at the time of the Snapshot store.
Range	<1-512> A sequential number of DMX Outputs. Example 1-512 would be all DMX Outputs.
Time	<0-65535> Time is in tenths of seconds. Except where noted.
Value	<0-255> usually refers to one of the 512 DMX Inputs or Outputs

SPECIAL NOTES:

1 Many of the following commands can contain more than

64 characters because of the list of DMX Outputs. Command are limited to 64 characters. These long commands must separated in multiple smaller commands. Each command must still stand on is own.

2 All command letters MUST BE capitals. All lower case letters will be ignored.

3 Only spaces are allowed in commands after first two chars of command. The first two chars of the command MUST BE in the first two positions. After the first two chars spaces are allowed for readability.

DESCRIPTION

The AXB-DMX512 uses a highest value takes priority to determine what DMX value is actually output. There are three Output buffers, the Patch buffer, the Group buffer, and the Direct Control buffer. Each represents all 512 DMX Outputs. The highest value in any buffer is the value transmitted from the Output port. The Actual DMX Output refers the value being transmitted.

The Patch buffer is modified by DMX Input. The Patch commands determine which if any DMX inputs modify the Patch buffer. A Patch disconnect automatically clears the value in the patch buffer to zero. If no DMX Input for 5 seconds all values in DMX Input buffer are set to zero. Any Outputs tied those DMX Inputs will then be zero.

The Group buffer is modified by changing group commands. Groups can ramp over time. Groups can be tied to AMX levels or DMX Inputs. The Groups can be absolute or proportional. For Groups that are absolute, the value of all outputs are the same as the Group level. Proportional Group Outputs are dependent on a specified value or the Actual DMX Output at the time the Output is added to the Group. That value sets the maximum value the Group Outputs can reach.

The Direct control buffer is modified by individual Output ramps or by Preset recalls. Presets are also call snapshots or scenes.

4.2 COMMANDS

(SEND_COMMAND DEV,"command")

DR <List of DMX Outputs> L <level> T<Time>

Ramps the DMX Output to the L level in T tenths of seconds. Time is NOT optional. The list can be single Output(s) and/or range(s) of Outputs separated by commas. If a Snapshot Preset is in progress then last command sent will win for each Output.
Do not put more 64 characters total in this command.
Example: SEND_COMMAND DMX,'DR1L100%T10'
Ramps DMX Output channel 1 to 100% (full) in 1 second.

DS <Preset Number>

Store a Snapshot of all DMX Output channels. This stores the Actual DMX Output values.

DL <Preset Number> T <time>
Recall a Snapshot of all DMX Output Channel in T tenths of seconds. Time is NOT optional here. If a Direct Ramp is in progress the last command sent will win for each Output.

DZ
Clears all values in the Direct Control Buffer to zero. Stops all `DR' ramps.

SEND COMMANDS: Patch Buffer

PC <DMX Input> D <List of DMX Outputs>
Connect a DMX Input to DMX Output(s). The list can be single Output(s) and/or range(s) of Outputs separated by commas.
Example: SEND_COMMAND DMX,'PC1D1,3,5-7'
Connect DMX Input 1 to DMX Outputs 1,3,4,6,7.

PX <List of DMX Outputs>
Disconnect a DMX Output(s) from any DMX Input. The list can be single Output(s) and/or range(s) of Outputs separated by commas. Do not put more 64 characters total in this command. A Disconnect will clear the Patch Buffer for that Output to 0.

PA
Global Connect all DMX Inputs to DMX Outputs in a 1 to 1 relationship.

PZ
Global Delete all DMX Outputs from any DMX Input.

SEND COMMANDS: Group Buffer

GR <Group> L <Level> {T <Time>}
Ramps a Group to a L level in T tenths of seconds. If no time is given, then it will ramp at the current ramp rate for that Group. If a Group is tied to a DMX Input then this command is ignored. If the Group is tied to a AMX level that is not tied to a DMX Input then the AMX level will ramp with the Group. If another command affects this level then last command sent wins.
Example: SEND_COMMAND DMX,'GR1L0T10'
Ramps all DMX Output channels in Group 1 to 0 (lowest) in 1 second.

GA <Group> D <List of DMX Output >
Add DMX Output(s) to a Group. The list can be single Output(s) and/or range(s) of Outputs separated by commas. A DMX Output can only belong to one Group at a time.
Example: SEND_COMMAND DMX,'GA1D1,3,5-7'
Adds DMX Output Channels 1, 3, 5, 6, 7 to Group 1.

GP <Group> D <List of DMX Outputs>
Same as `GA' command, except the value of the output is

proportional to the Actual DMX Output value at time of adding the Output. That means the highest the DMX Output can EVER be is the value at the time of the add. A DMX Output can only belong to one Group at a time.

GF <Group> D <Special List of DMX Outputs with Max Value>
Same as `GP' command, except the Max value for that output to is given at time of adding the Output. . After the Output there is a dash then the Max value for that output(s). That means the highest the DMX Output can EVER be is the value given at the time of the add. Ranges are allowed but only have one Max Value for whole range.
Example: SEND_COMMAND DMX,'GF1D1@100%,2@75%,4-7@64'

GL <List of DMX Outputs>
Delete DMX Output(s) from any Group. The list can be single Output(s) and/or range(s) of Outputs separated by commas.

GE <List of Groups>
Erase Group(s). The list can be single Group(s) and/or range(s) of Groups separated by commas. Removes all DMX Outputs from the Group(s).

SEND COMMANDS: Group Buffer

GO <List of Groups>
Sets the current output values in the Group(s), to the same value as the current actual DMX output. This has the effect of copying the highest value from the patch or direct control buffer into the group buffer if they are higher than the value in the group buffer.

GT <List of Groups> R <Time> {U or D}
Sets the current ramp rate of the Group(s). The specified time determines how long it takes to go full range. If the group is proportional then Individual Output rates will be proportional. The U and D can set different up and down ramp rates. Without a U or D both up and down ramp rates are set the same.
Example: SEND_COMMAND DMX,'GT1R5'
Sets Group 1 to ramp rate to .5 second both up and down.

GC < List of Group> <A or D ><AMX Level or DMX Input>
Connects the AMX Level to a Group or connects the DMX Input to a Group. A Group can only be tied to one or the other not both. The list can be single Group(s) and/or range(s) of Groups separated by commas. If a single Group is connected to a unconnected AMX Level, then the AMX Level value will change to the Group value. Otherwise the Group value will change to the AMX Level.

GX <List of Groups>
Disconnects Group(s) from AMX level or DMX level. The list can be single Group(s) and/or range(s) of Groups separated by commas.

GU <List of Group>
Ramp UP Groupat current Ramp Rate. Will Ramp until `GS' ,'GR', or `GD'. The list can be single Group(s) and/or range(s) of Groups separated by commas.

GD <List of Group>
Ramp DOWN Group at current Ramp Rate. Will Ramp until `GS','GR', or `GU'. The list can be single Group(s) and/or range(s) of Groups separated by commas.

GS <List of Group>
Stop Group Ramp. Stops `GU','GD','GR'. The list can be single Group(s) and/or range(s) of Groups separated by commas.

GZ
Global Delete all Groups. Disconnect all Groups.

SEND COMMANDS: AMX levels

AR <AMX Level> L <level> {T <Time>}
Ramps the AMX Level to the L level in T tenths of seconds. If no time is given, then it will ramp at the current ramp rate. If a Group is tied to the AMX level then the Group will ramp with the AMX level. If another command affects this level then last command sent wins.
Example: SEND_COMMAND DMX,'AR1L255T5'
Ramps AMX level 1 to step 255 (full) in .5 second.

AT <AMX Level> R <Time> {U or D}
Sets the current ramp rate of the AMX Level. The specified time determines how long it takes to go full range. The U and D can set different ramp up and ramp down rates. Without a U or D both up and down ramp rates are set the same.
Example: SEND_COMMAND DMX,'AT1R5'
Sets AMX level 1 to ramp rate to .5 second both up and down.

AC <AMX Level> D <DMX Input >
Connect a DMX Input to a AMX Level. Only one DMX Input can be connected to a AMX level at one time. If the AMX level is connected to a Group, then the Groups will change with the DMX Input.
Example: SEND_COMMAND DMX,'AC1D512'
Connects DMX Input 512 to AMX level 1

AX <AMX Level>
Disconnect a AMX Level from a DMX Input

AU <AMX Level>
Ramp UP AMX Level at current Ramp Rate. Will Ramp until `AS' ,'AR', or `AD'.

AD <AMX Level>

Ramp DOWN AMX Level at current Ramp Rate. Will Ramp until `AS','AR', or `AU'.

AS <AMX Level>
Stop AMX Level Ramp. Stops `AU','AD','AR'.

AZ
Global Disconnect all AMX levels from DMX Input. Stops all Ramps.

SEND COMMANDS: Miscellaneous

MO <DMX Output > ?
Return the current value of a Actual DMX Output.
Causes a string to be sent to the master.

MI <DMX Output > ?
Return the current value of a DMX Input.
Causes a string to be sent to the master.

MG <Group > ?
Return the current average of all the outputs in a group.
Causes a string to be sent to the master.

ML <number>
The number of Output that are transmitted. Default and Max is 512.
Example: SEND_COMMAND DMX,'ML128'
Sends out only 128 Outputs per packet. This will cause 88 packets per second with no other changes.

MB <Time in uS >
Break Time in micro seconds .Default and Min is 88uS. Max is 10000uS.

MM <Time in uS>
Mark Time after Break in micro seconds . Default and Min is 8uS. Max is 10000uS.

MD <Time in uS>
Idle Time after Packet in 10 micro seconds. Default and Min is 1 x 10us. Max is 10000 x 10uS.

MR { <Type> }
Reset all parameters to get 44 or 22 Packets per second with 512 Outputs. Type is optional. No Type or Type = 0 is 44 packets per second. Type = 1 is 22 packets per second.

MP
Return the max number Presets.
Causes a string to be sent to the master.

MZ

Reset Everything. This clears all Groups,Presets,Patches,
Times and everthing else. This is a total memory clear.

SEND COMMANDS: Channel Triggers

CA <AMX channel > D <DMX Input> L < Low> { H < High> }
This commands sets up a AMX channel to generate a trigger when a DMX input is a value or range of values. The High is optional. When the DMX input is equal to Low then the AMX channel will turn on. If a Level High is given then the AMX channel will go high if DMX Input is >= Low and DMX Input <= High. The AMX channel will stay on as long as the DMX input is the right value or in the range of values. AMX channel must be 209 to 248 all others will be ignored.
Example: SEND_COMMAND DMX,'TA209D1L64H128'
AMX channel 209 will go on if 64 <= DMX Input 1 <= 128.

CL <AMX channel >
Delete a channel trigger.

CZ
Delete all channel triggers.

---

5 AXB-EM232 Enhanced Master 232

5.1 COMMANDS

```
MASTER:

'CLOCK mm-dd-yy hh:mm:ss' sets the time and date.

   Example:
   'CLOCK 01-08-93 19:16:00' sets the time to 7:16 PM and date
       to January 8, 1993

'COMP' Sends COMPARE DEVICE strings to requesting device.
'MASN' Sending device is turning Master Mode On.
'MASF' Sending device is turning Master Mode Off.

"'RDS',dev,string" re-directs a string to the device specified in dev.
"'RDC',dev,command" re-directs a command to the device specified in dev.

   Examples:
   SEND_COMMAND 0,"'RDS',200,'HELLO'"
     same as SEND_STRING 200,'HELLO' in axcess.
   SEND_COMMAND 0,"'RDC',200,'PAGE-MAIN PAGE'"
     same as SEND_COMMAND 200,'PAGE-MAIN PAGE' in axcess.

 'SHOW XXX' Sends SHOW DEVICE strings to requesting device starting
            at device XXX.

 Note: If a Send_Command to the master starts with an ESC, the second
       byte is used as the requesting device instead of the device
       that sent the command.  The command is then assumed to begin
       with the third byte.

RS232/422 devices 1-2:

'RXON' enables card to send incoming received characters to Master.
   This command is automatically sent by Master when a
   'CREATE_BUFFER' program instruction is executed
'RXOFF' (default) card will not pass on received characters to
   Master
'RXCLR' any characters waiting in the receive buffer waiting to be
   sent to Master will be cleared                (v3.620)
'TXCLR' any characters waiting in the transmit out buffer will
   be cleared and transmission will stop         (v3.620)
'B9MON' enables a special 9 data bits with 1 stop bit mode which
   overrides the DIP switch settings for number of data, stop, and
   parity bits.  The baud rate is locked on at the current DIP switch
   setting on issuance of this command
'B9MOFF' (default) sets data bits mode to normal with DIP switch
   setting
'HSOFF' (default) hardware handshaking disabled. (Device 2 only)
'HSON' enable hardware handshaking              (Device 2 only)
'XOFF' (default) software handshaking disabled
'XON' enable software handshaking
'CHARD-<time in 100 microsecond increments 0-255>' sets delay between
```

all transmitted characters to that specified

Example of usage:
'CHARD-10' sets 1mS delay between all transmitted characters

'CHARDM<time in 1 millisecond increments 0-255>' sets delay between all transmitted characters to that specified

Example of usage:
'CHARDM10' sets 10mS delay between all transmitted characters

'CTSPSH' enables PUSHes and RELEASEs and status on Device 2 channel 255 for CTS hardware handshake input. If CTS is high, then channel is on. (added V3.731)

SEND_STRINGs:

This card also has some special SEND_STRING escape sequences:

If any of the 3 character combinations below are found anywhere within a SEND_STRING program instruction, they will be treated as a command and not the literal characters:

* "27,17,<time in 100 microsecond increments 1-255>" sends a break character of the specified length of time
* "27,18,1" sets the 9th data bit to 1 for all subsequent characters to be transmitted. Used in conjunction with the 'B9MON' command
* "27,18,0" clears the 9th data bit to 0 for all subsequent characters to be transmitted. Used in conjunction with the 'B9MON' command
* "27,19,<time in 1 millisecond increments 1-255>" inserts a delay before the next character to be transmitted
* "27,20,0" un-asserts RTS hardware handshake output high (Device 2)
* "27,20,1" asserts RTS hardware handshake output low (Device 2)

---

6 AXB-FD Floppy disk

6.1 CHANNELS

CHANNEL	FUNCTION
1-16	Channel number corresponding to file# PUSHed and RELEASEd for end of file (EOF) or disk full
20	Channel PUSHed and RELEASEd for disk access error
254	PUSH and RELEASE channel for front panel LOAD button
255	PUSH and RELEASE channel for front panel SEND button

6.2 COMMANDS

(SEND_COMMAND DEV,"command")

```
'DEL <DOS filename>' deletes filename from disk.  If file does not
   exist, channel 20 is PUSHed and RELEASEd.
'DIR' reads and sends the list (directory) of files that are on the
    disk (as strings)
'OPEN <DOS filename>,R|W|A,<file# 1-16>' opens the specified filename
   for (R)eading,(W)riting, or (A)ppend.  All future references up
   until the file is closed will use the specified file#.  If
   attempting to open a file for read that does not exist, then
   channel 20 is PUSHed and RELEASEd.  When a file is opened for
   Writing, if it does not exist, it is created-if it does exist,
   the file length is set to zero bytes.  When a file is opened for
   Append, if it does not exist, it is created-if it does exist, a
   seek to the end of the file is executed and any writes to the file
   are added at the end.  Both button LEDs are on if any files are open.
'CLOSE <file#>' closes the specified file
'CLOSEALL' closes all files that are open
'READ <file#>,<number of bytes>' reads and sends the specified
   number of bytes from the specified file (as a string).  If
   an end of file (EOF) is encountered, then channel <file#> is
   PUSHed and RELEASEd
'READLN <file#>' reads and sends one line of text from the
   specified file (as a string).  A line of text ends in a carriage
   return (decimal 13), a line feed (decimal 10), or a combination
   both carriage return and line feed.  If an end of file (EOF) is
   encountered, then channel <file#> is PUSHed and RELEASEd
'SEEK <file#>,<which byte number>' seeks to the specified byte
   number (position) in the specified file.  If a seek past the
   end of the file is attempted, then channel <file#> PUSHed and
   RELEASEd
'WRITE=<file#>' sets the current next file to be written to when
   strings are received.  An 'OPEN' for write command automatically
   sets the next file to be written to that opened.  If writing and
   the disk becomes full, channel <file#> is PUSHed and RELEASEd

If during any of the above commands the disk drive has problems
  accessing the disk (because disk is not present, bad disk, wrong
  format, etc), then channel 20 is PUSHed and RELEASEd quickly to
  indicate an error

>> Use the SEND_STRING instruction to send bytes (characters) to the
     floppy disk for writing.  Use a CREATE_BUFFER instruction to
```

receive bytes (characters) from reading the floppy disk (or requesting the directory)

The LOAD button is essentially functionless but does do a PUSH on channel 254. In addition to PUSHing channel 255, the SEND button will try to try to reprogram a system by reading files from the disk. While a SEND is in progress, the SEND button LED blinks rapidly. The first file that is searched for is called STARTUP.BAT. It can have commands as follows (commands must start on column 1):

* SEND <filename> loads the Master with the specified file
* SENDTP <filename>,<device#> loads the touch panel at the specified device# with the specified file
* SENDIR <filename>,<device#> loads the IR unit at the specified device# with the specified file
* SEND232 <filename>,<device#> loads the AXB-232+ unit at the specified device# with the specified file

---

7 AXB-IRS4 IR/Serial Interface

7.1 CHANNELS

CHANNEL	FUNCTION
1 - 199	IR output
200 - 252	If IR function programmed - IR output. If IR function not programmed - Dummy status channels for SYSTEM_CALLS.
Internal Test Channels	
253	NV DATA error, data reset.
254	NV DATA FATAL error, could not read memory.
255	No IR commands loaded

7.2 COMMANDS

(SEND_COMMAND DEV,"command")

```
The AXB-IRS4 will buffer 24 of the CH,SP,CP,CTON,and CTOF send_commands
and will perform these commands when the IR channels become available.

"'CH',<channel>"     Channel command:

      This command will send out the appropriate IR pulses to select the
      desired channel.
      NOTE: All channel below 100 are two digits.
      NOTE: If the IR code for ENTER (#21) is loaded a enter
            will follow the number.
      NOTE: If the channel is >= 100 then IR fn 127 is generated for the
            one hundred digit.

      Examples:

      SEND_COMMAND Dev,"'CH',18"

      The AXB-IRS4 will:
      1 - Pulse out the IR code for 1 (IR code 11) for the
          time set by CTON.
      2 - Wait for the time set by CTOF.
      3 - Pulse out the IR code for 8 (IR code 18) for the
          time set by CTON.
      4 - Wait for the time set by CTOF.

      If the IR code for ENTER (IR code 21) is programmed:

      5 - Pulse out the IR code for ENTER (IR code 21) for the
          time set by CTON.
      6 - Wait for the time set by CTOF.

      SEND_COMMAND Dev,"'CH',130"

      The AXB-IRS4 will:
      1 - Pulse out the IR code for 100 (IR code 127) for the
          time set by CTON.
      2 - Wait for the time set by CTOF.
```

```
      3 - Pulse out the IR code for 3 (IR code 13) for the
          time set by CTON.
      4 - Wait for the time set by CTOF.
      5 - Pulse out the IR code for 0 (IR code 10) for the
          time set by CTON.
      6 - Wait for the time set by CTOF.

      If the IR code for ENTER (IR code 21) is programmed:

      7 - Pulse out the IR code for ENTER (IR code 21) for the
          time set by CTON.
      8 - Wait for the time set by CTOF.

                      Channel times:

"'CTON',<time>"       Sets channel pulse on  time in tenths of second.

"'CTOF',<time>"       Sets channel pulse off time in tenths of second.

                      Default time is 5 (.5 seconds).
                      Time is store in NV Ram.

      Examples:

      SEND_COMMAND Dev,"'CTON',2"  Sets Pulse On time to .2 seconds.
      SEND_COMMAND Dev,"'CTON',10" Sets Pulse On time to  1 seconds.
      SEND_COMMAND Dev,"'CTOF',7"  Sets Pulse Off time to .7 seconds.
      SEND_COMMAND Dev,"'CTOF',15" Sets Pulse Off time to 15 seconds.

'XCHM <extended channel mode(0-3)>' Change the output pattern for the
   XCH send command.
   Mode 0:  [x][x]<x><enter>
   Example:  'XCH 3'    The resulting IR would be 3-enter.
   Example:  'XCH 34'   The resulting IR would be 3-4-enter.
   Example:  'XCH 343'  The resulting IR would be 3-4-3-enter.

   Mode 1:  <x><x><x><enter>
   Example:  'XCH 3'    The resulting IR would be 0-0-3-enter.
   Example:  'XCH 34'   The resulting IR would be 0-3-4-enter.
   Example:  'XCH 343'  The resulting IR would be 3-4-3-enter.

   Mode 2:  <x><x><x>
   Example:  'XCH 3'    The resulting IR would be 0-0-3.
   Example:  'XCH 34'   The resulting IR would be 0-3-4.
   Example:  'XCH 343'  The resulting IR would be 3-4-3.

   Mode 3:  [[100][100]....]<x><x>
   Example:  'XCH 3'    The resulting IR would be 0-3.
   Example:  'XCH 34'   The resulting IR would be 0-3-4.
   Example:  'XCH 343'  The resulting IR would be 100-100-100-4-3.

'XCH<Channel 0-999>' Produdes the IR according to the pattern set by
   the XCHM send command.

"'SP',<code>"         Single Pulse:

      This will pulse the actual IR code.
```

Pulse time set by 'CTON' and 'CTOF' commands.

Examples:

```
SEND_COMMAND Dev,"'SP',2"  Pulses command 2.
SEND_COMMAND Dev,"'SP',50" Pulses command 50.
```

"'CP',<code>" Clear Pulse:

Same as 'SP' but will clear all commands that are in the buffer waiting to be done.

Examples:

SEND_COMMAND Dev,"'CP',2" Clears all pending commands ,Pulses command 2.
SEND_COMMAND Dev,"'CP',50" Clears all pending commands ,Pulses command 50.

Other Commands:

'IROFF' - stops any current IR being generated.

'CARON' - IR Carrier will respond according to the front panel DIP switch setting.
'CAROFF' - IR Carrier is turned off until a 'CARON' command is received. Overrides front panel DIP switch setting.

Examples:

```
SEND_COMMAND Dev,'IROFF'  Stops current IR out on Dev.
SEND_COMMAND Dev,'CARON'  Dev will send carrier according
                          to DIP switch.
SEND_COMMAND Dev,'CAROFF' Dev will not send carrier.
```

Memory Clear Commands.

'ZAP!' - Clears a devices IR data and re-initializes 'CTON' 'CTOF' to their default values.

'ZAPALL!' - Clears all devices IR data and re-initializes 'CTON' 'CTOF' to their default values.

Examples:

```
SEND_COMMAND Dev,'ZAP!'    Clears Dev IR load and sets CTON
                           and CTOF to 5.
SEND_COMMAND Dev,'ZAPALL!' Clears ALL 4 devices IR load and
                           sets CTON and CTOF to 5.
```

RS232 Protocol:

General Notes:

```
dev -  ASCII device number.
        Valid devices are '1' - '4'.
chan - ASCII channel number.
        Valid channel numbers are '1' - '252'
time - ASCII time value in tenths of seconds.
        Valid times are '1' - '255'.

Commands are terminated with a <CR> Carriage Return
        (Decimal 13 or Hex $0D).

IR Output Commands:

ON[dev,chan]<CR>  - Start IR output on a device,channel.
OFF[dev,chan]<CR> - Stop  IR output on a device,channel.
                A chan of '0' will turn off current IR.

Channel command:

CH[dev,chan]<CR>

Example:

CH[1,33]<CR>   - Will send IR pulses out port 1 to select channel 33.

NOTE: All channel below 100 are two digits.
NOTE: If the IR code for ENTER (#21) is loaded a
      enter will follow the number.
NOTE: If the channel is >= 100 then IR fn 127 is generated
      for the one hundred digit.

Channel Pulse Time Commands:

CTON(dev,time)<CR> On  Time in tenths of second.
CTOF(dev,time)<CR> Off Time in tenths of second.
                   Default time is .5 seconds.
                   Time is store in NV Ram.

Single Pulse:

SP[dev,chan]<CR>   This will pulse the actual IR code.
                   Pulse time set by 'CTON' and 'CTOF' commands.

Clear Pulse:

CP[dev,chan]<CR>   Same as 'SP' but will clear all commands that
                   are in the buffer waiting to be done.


Carrier Commands:

CARON(dev)<CR>     Carrier will respond according to the front panel
                   DIP switch setting.
CAROFF(dev)<CR>    Carrier is turned off until a 'CARON' command is
                   received. Overides front panel DIP switch setting.

Memory Clear Commands:
```

```
ZAP!(dev)<CR>      Clears a devices IR data and re-initializes
                   'CTON' 'CTOF' to their default values.
ZAPALL!<CR>        Clears all devices IR data and re-initializes
                   'CTON' 'CTOF' to their default values.

Miscellaneous Commands:

VER - Displays current version.
MEM - Displays current available memory.
ECHO ON  - Turns Terminal Character Echo On.
ECHO OFF - Turns Terminal Character Echo Off.

Note:
AXB-IRS4 will respond to SX-DCU+ RS232 protocol.

Extended Channel Commands
'XCHM-<extended channel mode(0-3)>' Change the output pattern for the
XCH send command.
Mode 0:  [x][x]<x><enter>
Example:  'XCH 3'    The resulting IR would be 3-enter.
Example:  'XCH 34'   The resulting IR would be 3-4-enter.
Example:  'XCH 343'  The resulting IR would be 3-4-3-enter.

Mode 1:  <x><x><x><enter>
Example:  'XCH 3'    The resulting IR would be 0-0-3-enter.
Example:  'XCH 34'   The resulting IR would be 0-3-4-enter.
Example:  'XCH 343'  The resulting IR would be 3-4-3-enter.

Mode 2:  <x><x><x>
Example:  'XCH 3'    The resulting IR would be 0-0-3.
Example:  'XCH 34'   The resulting IR would be 0-3-4.
Example:  'XCH 343'  The resulting IR would be 3-4-3.

Mode 3:  [[100][100]....]<x><x>
Example:  'XCH 3'    The resulting IR would be 0-3.
Example:  'XCH 34'   The resulting IR would be 0-3-4.
Example:  'XCH 343'  The resulting IR would be 100-100-100-4-3.

'XCH<Channel 0-999>' Produdes the IR according to the pattern set by
the XCHM send command.
```

---

8 AXB-MIDI MIDI Box

8.1 CHANNELS

CHANNEL **DESCRIPTION**

1-8	AMX Level 1-8 Ramp UP
9-16	AMX Level 1-8 Ramp DOWN
17-112	Group 1-96 Ramp UP
113-208	Group 1-96 Ramp DOWN
209-248	Programable DMX Input triggers

8.2 COMMANDS

(SEND_COMMAND DEV,"command")

'INA-<value>' configures the destination for the incoming data on MIDI IN A. The following table lists all possible combinations. An 'X' in the column indicates that data does get transfered to that destination. The (*) indicates the power-up default.

value	MIDI THRU	MIDI OUT	MASTER
0			
1	X		
2		X	
3 (*)	X	X	
4			X
5	X		X
6		X	X
7	X	X	X

'INB-<value>' configures the destination for the incoming data on MIDI IN A. The following table lists all possible combinations. An 'X' in the column indicates that data does get transfered to that destination. The (*) indicates the power-up default.

value	MIDI THRU	MIDI OUT	MASTER
0			
1	X		
2		X	
3 (*)	X	X	
4			X
5	X		X
6		X	X
7	X	X	X

'RXACLR' any characters waiting in the IN A receive buffer to be sent to Master will be cleared.

'RXBCLR' any characters waiting in the IN B receive buffer
to be sent to Master,MIDI THRU, or MIDI OUT will be cleared.

'RXCLR' any characters waiting in both receive buffers
to be sent to Master, MIDI THRU, or MIDI OUT will be cleared.

'RXON' enables AXB-MIDI to send incoming received characters
to Master. This command is automatically sent by Master
when a 'CREATE_BUFFER' program instruction is executed.

'RXOFF' (default) AXB-MIDI will not pass on received characters
to Master

'TXCLR' any characters waiting in both transmit buffers (MIDI
THRU and MIDI OUT) will be cleared.

'TXOUTCLR' any characters waiting in the MIDI OUT transmit
buffer will be cleared.

'TXTHRUCLR' any characters waiting in the MIDI THRU transmit
buffer will be cleared.

Notes:

MIDI data is merged properly and the MIDI data is not scrambled
together.

---

9 AXB-TM Television Manager

9.1 CHANNELS

CHANNEL	FUNCTION
1	while channel is on, generates IR/Serial function 1, else off
2-127	similar except for functions 2 through 127

Note: Turning another channel (IR/Serial function) on while one is currently on will automatically turn the current one off first

128-247	received IR code PUSH and RELEASE channels
248	a PUSH on this channel indicates power fail error (V1.30)
249	if this channel and 250 are on, Response LED will blink (V1.20)
250	while channel is on, front panel Response LED is on, else off
251	while channel is on, I/O 1 is on (switch to GND), else off
252	while channel is on, I/O 2 is on (switch to GND), else off
253	while channel is on, I/O 3 is on (switch to GND), else off
254	while channel is on, I/O 4 is on (switch to GND), else off

Note: Contact closure inputs on I/O 1 through I/O 4 will also generate PUSHes and RELEASEs on channels 251 through 254 respectively

255	channel is on if TV Power sensor is detecting horizontal scan

9.2 COMMANDS

(SEND_COMMAND DEV,"command")

```
"'RO',<offset>" sets incoming IR offset.  Offset is subtracted
   from the incoming IR code before sending to Master
"'DE',<time in tenth seconds>" sets the delay time that the TV power
   sensor must be stable before being considered changed.  Default
   is 1 second
"'DC',<IR in>,<IR out>" makes a direct connection whereby the IR
   function <IR out> is generated for as long as the <IR in> code is
   being received. The <Ir in> code PUSH and RELEASE is NOT sent to
   Master.  Maximum of 16 direct connects
'DK' deletes all DC direct connections

Up to 16 of the following commands will be buffered and performed in
  the order received:

'PON' turns on TV based on TV Power sensor.  If sensor reads that TV
   is off then IR function 27 is generated in attempt to turn TV on.
   If 3 attempts fail, unit will continue executing commands in
   the buffer.  If no commands are in the buffer, unit will continue
   to try until a 'POF' or 'POD' command is received.  If unit fails
   to turn TV on, a PUSH and RELEASE on channel 248 is made to
   indicate a power failure error.  If at any time the Power sensor
   reads that the TV is off (such as if one went to the front panel
   and turned it off), the unit will automatically attempt to turn
   TV back on.  Channel 255 changes are disabled after receipt of
   this command
'POF' turns off TV based on TV Power sensor.  If sensor reads that TV
```

is on then IR function 28 is generated in attempt to turn TV off. If 3 attempts fail, unit will continue executing commands in the buffer. If no commands are in the buffer, unit will continue to try until a 'PON' or 'POD' command is received. If unit fails to turn TV off, a PUSH and RELEASE on channel 248 is made to indicate a power failure error. If at any time the Power sensor reads that the TV is on (such as if one went to the front panel and turned it on), the unit will automatically attempt to turn TV back off. Channel 255 changes are disabled after receipt of this command

'POD' disables previous 'PON' or 'POF' commands for forcing TV power. Channel 255 changes are enabled

"'PTON',<time in tenth seconds>" sets the IR Power on pulse time. Default time is 5 (.5 second). Time is stored in permanent memory until changed

"'PTOF',<time in tenth seconds>" sets the amount of off time after an IR Power on pulse before new IR pulses can be generated (gives TV time to power up and get ready). Default time is 15 (1.5 seconds). Time is stored in permanent memory

"'CH',<TV channel>" generates the IR digit pulses necessary to select the TV channel specified. Channels below 100 are generated as two digit pulses, and if channel is >= 100 then IR function 127 is generated for the one hundred digit. If IR function 21 exists (ENTER for TVs that have this function), then it will follow the digit pulses

"'CTON',<time in tenth seconds>" sets the IR on pulse time for the channel digits and 'SP' pulses. Default time is 5 (.5 second). Time is stored in permanent memory until changed

"'CTOF',<time in tenth seconds>" sets the IR off time between pulses for the channel digits and 'SP' commands. Default time is 5 (.5 second). Time is stored in permanent memory

"'SP',<IR out>" generates a single pulse of the specified IR function. Pulse times are set by 'CTON' and 'CTOF'

'PIN' Turn on function that will OR together IO1 and power sensor to determine actual TV status. IO2 will follow 'PON' and 'POF' commands. The status of this function is stored in permanent memory until changed.

'PIF' Turn off 'PIN' feature.

---

10 AXB-TMC Television Manager Plus with Clock Option

11 AXB-TMX+ Television Manager Plus

11.1 CHANNELS

CHANNEL	FUNCTION
1	while channel is on, generates IR/Serial function 1, else off
2-127	similar except for functions 2 through 127

Note: Turning another channel (IR/Serial function) on while one is currently on will automatically turn the current one off first

128-247	received IR code PUSH and RELEASE channels
248	a PUSH on this channel indicates power fail error (V1.30)
249	if this channel and 250 are on, Response LED will blink (V1.20)
250	while channel is on, front panel Response LED is on, else off
251	while channel is on, I/O 1 is on (switch to GND), else off
252	while channel is on, I/O 2 is on (switch to GND), else off
253	while channel is on, I/O 3 is on (switch to GND), else off
254	while channel is on, I/O 4 is on (switch to GND), else off

Note: Contact closure inputs on I/O 1 through I/O 4 will also generate PUSHes and RELEASEs on channels 251 through 254 respectively

255	channel is on if TV Power sensor is detecting horizontal scan

---

CHANNELS SPECIFIC TO CLOCK OPERATION

249	A push and release on this channel indicates that the count down timer has counted down to 0.
250	A push and release on this channel indicates that a scroll has completed. This occurs after all the trailing blanks plus one have scrolled off the display. (See the scroll send command for more information on trailing blanks).

11.2 COMMANDS

(SEND_COMMAND DEV,"command")

```
'CARON' Turn the IR carier on (default).
'CAROFF' Turns the IR carrier off.
"'RO',<offset>" sets incoming IR offset.  Offset is subtracted
   from the incoming IR code before sending to Master
"'DE',<time in tenth seconds>" sets the delay time that the TV power
   sensor must be stable before being considered changed.  Default
   is 1 second
"'DC',<IR in>,<IR out>" makes a direct connection whereby the IR
   function <IR out> is generated for as long as the <IR in> code is
   being received. The <Ir in> code PUSH and RELEASE is NOT sent to
   Master.  Maximum of 16 direct connects
'DK' deletes all DC direct connections
```

'?PTON' Request the current PTON setting. The TV Manager (v2.28)
will respond with the string "'PTON',value" where value is
time in tenth seconds.

'?PTOF' Request the current PTOF setting. The TV Manager (v2.28)
will respond with the string "'PTOF',value" where value is
time in tenth seconds.

'?CTON' Request the current CTON setting. The TV Manager (v2.28)
will respond with the string "'CTON',value" where value is
time in tenth seconds.

'?CTOF' Request the current CTOF setting. The TV Manager (v2.28)
will respond with the string "'CTOF',value" where value is
time in tenth seconds.

'?DE' Request the current DE setting. The TV Manager (v2.28)
will respond with the string "'DE',value" where value is
time in tenth seconds.

NOTE: All request SEND_COMMANDs respond with strings to the master.
If a RS232 device is also sending strings to the TMX, the AXCESS
code must be written to handle the mixing of the data between
the device and the TMX response strings in the buffer.

Up to 16 (64 V2.26) of the following commands will be buffered and performed in
the order received:

'PON' turns on TV based on TV Power sensor. If sensor reads that TV
is off then IR function 27 is generated in attempt to turn TV on.
If 3 attempts fail, unit will continue executing commands in
the buffer. If no commands are in the buffer, unit will continue
to try until a 'POF' or 'POD' command is received. If unit fails
to turn TV on, a PUSH and RELEASE on channel 248 is made to
indicate a power failure error. If at any time the Power sensor
reads that the TV is off (such as if one went to the front panel
and turned it off), the unit will automatically attempt to turn
TV back on. Channel 255 changes are disabled after receipt of
this command
'POF' turns off TV based on TV Power sensor. If sensor reads that TV
is on then IR function 28 is generated in attempt to turn TV off.
If 3 attempts fail, unit will continue executing commands in
the buffer. If no commands are in the buffer, unit will continue
to try until a 'PON' or 'POD' command is received. If unit fails
to turn TV off, a PUSH and RELEASE on channel 248 is made to
indicate a power failure error. If at any time the Power sensor
reads that the TV is on (such as if one went to the front panel
and turned it on), the unit will automatically attempt to turn
TV back off. Channel 255 changes are disabled after receipt of
this command
'POD' disables previous 'PON' or 'POF' commands for forcing TV
power. Channel 255 changes are enabled
"'PTON',<time in tenth seconds>" sets the IR Power on pulse time.
Default time is 5 (.5 second). Time is stored in permanent
memory until changed
"'PTOF',<time in tenth seconds>" sets the amount of off time after

an IR Power on pulse before new IR pulses can be generated
(gives TV time to power up and get ready). Default time is 15
(1.5 seconds). Time is stored in permanent memory

"'CH',<TV channel>" generates the IR digit pulses necessary to
select the TV channel specified. Channels below 100 are generated
as two digit pulses, and if channel is >= 100 then IR function 127
is generated for the one hundred digit. If IR function 21 exists
(ENTER for TVs that have this function), then it will follow the
digit pulses

"'CTON',<time in tenth seconds>" sets the IR on pulse time for the
channel digits and 'SP' pulses. Default time is 5 (.5 second).
Time is stored in permanent memory until changed

"'CTOF',<time in tenth seconds>" sets the IR off time between
pulses for the channel digits and 'SP' commands. Default time
is 5 (.5 second). Time is stored in permanent memory

"'SP',<IR out>" generates a single pulse of the specified IR
function. Pulse times are set by 'CTON' and 'CTOF'

'PIN' Turn on function that will OR together IO1 and power sensor
to determine actual TV status. IO2 will follow 'PON' and 'POF'
commands. The status of this function is stored in permanent
memory until changed.

'PIF' Turn off 'PIN' feature.

'XCHM-<extended channel mode(0-3)>' Change the output pattern for the
XCH send command.

```
Mode 0:  [x][x]<x><enter>
Example:  'XCH 3'    The resulting IR would be 3-enter.
Example:  'XCH 34'   The resulting IR would be 3-4-enter.
Example:  'XCH 343'  The resulting IR would be 3-4-3-enter.

Mode 1:  <x><x><x><enter>
Example:  'XCH 3'    The resulting IR would be 0-0-3-enter.
Example:  'XCH 34'   The resulting IR would be 0-3-4-enter.
Example:  'XCH 343'  The resulting IR would be 3-4-3-enter.

Mode 2:  <x><x><x>
Example:  'XCH 3'    The resulting IR would be 0-0-3.
Example:  'XCH 34'   The resulting IR would be 0-3-4.
Example:  'XCH 343'  The resulting IR would be 3-4-3.

Mode 3:  [[100][100]....]<x><x>
Example:  'XCH 3'    The resulting IR would be 0-3.
Example:  'XCH 34'   The resulting IR would be 0-3-4.
Example:  'XCH 343'  The resulting IR would be 100-100-100-4-3.
```

'XCH<Channel 0-999>' Produdes the IR according to the pattern set by
the XCHM send command.

RS232 commands (also buffered):

RS232 commands are buffered in the same buffer as the commands above.
Each 2 characters in a string (applicable in the RA command) require 1
buffer location.

'BC' - Bar Code. When on, two header bytes are added to all RS232
strings coming into the TMC/TMX+. Turning this option off will
eliminate these two bytes.

'BC' on:

ÚÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄ¿

```
   ³              BITS              ³
   ÃÄÄÄÂÄÄÄÂÄÄÄÂÄÄÄÂÄÄÄÂÄÄÄÂÄÄÄÂÄÄÄ´
   ³ 7 ³ 6 ³ 5 ³ 4 ³ 3 ³ 2 ³ 1 ³ 0 ³
   ÃÄÄÄÁÄÄÄÁÄÄÄÁÄÄÄÁÄÄÄÁÄÄÄÁÄÄÄÁÄÄÄ´
   ³ 1   1   1   1   1   1   1   1 ³
   ÀÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÙ
```

'BC' off:

```
 ÚÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄ¿
   ³              BITS              ³
   ÃÄÄÄÂÄÄÄÂÄÄÄÂÄÄÄÂÄÄÄÂÄÄÄÂÄÄÄÂÄÄÄ´
   ³ 7 ³ 6 ³ 5 ³ 4 ³ 3 ³ 2 ³ 1 ³ 0 ³
   ÃÄÄÄÁÄÄÄÁÄÄÄÁÄÄÄÁÄÄÄÁÄÄÄÁÄÄÄÁÄÄÄ´
   ³ 0   0   0   0   0   0   0   0 ³
   ÀÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÙ
```

RS232 Set UART - "'SU',<value>"

This will set the communication parameters.
Value is described below:

The combination of bits in value determine the baud rate, parity, data bits, and stop bits.

The bits of value:

```
ÚÄÄÄÄÂÄÄÄÄÂÄÄÄÄÂÄÄÄÄÂÄÄÄÄÂÄÄÄÄÂÄÄÄÄÂÄÄÄÄ¿
³  7 ³  6 ³  5 ³  4 ³  3 ³  2 ³  1 ³  0 ³
ÀÄÄÄÄÁÄÄÄÄÁÄÄÄÄÁÄÄÄÄÁÄÄÄÄÁÄÄÄÄÁÄÄÄÄÁÄÄÄÄÙ
ÀÄÄBAUD RATEÄÄÄÁÄÄÄÄPARITYÄÄÄÄÁDATAÁSTOPÙ
```

```
ÚÄÄÄÄÄÄÄÄÄÄÄÂÄÄÄÄÄÄÄ¿ ÚÄÄÄÄÄÄÄÄÄÄÄÂÄÄÄÄÄÄÄ¿ ÚÄÄÄÄÂÄÄÄÄ¿ ÚÄÄÄÄÂÄÄÄÄ¿
³   BITS    ³ BAUD ³ ³    BITS    ³PARITY³ ³BIT ³DATA³ ³BIT ³STOP³
ÃÄÄÄÂÄÄÄÂÄÄÄ´ RATE ³ ÃÄÄÄÂÄÄÄÂÄÄÄ´      ³ ÃÄÄÄÄ´BITS³ ÃÄÄÄÄ´BITS³
³ 7 ³ 6 ³ 5 ³      ³ ³ 4 ³ 3 ³ 2 ³      ³ ³ 1  ³    ³ ³ 0  ³    ³
ÃÄÄÄÁÄÄÄÁÄÄÄ´      ³ ÃÄÄÄÁÄÄÄÁÄÄÄ´      ³ ÃÄÄÄÄ´    ³ ÃÄÄÄÄ´    ³
³ 1   1   1 ³ 38400³ ³ 1   1   1 ³ NONE ³ ³ 1  ³ 8  ³ ³ 1  ³ 1  ³
³ 1   1   0 ³ 19200³ ³ 1   1   0 ³ ODD  ³ ³ 0  ³ 7  ³ ³ 0  ³ 2  ³
³ 1   0   1 ³  9600³ ³ 1   0   1 ³ EVEN ³ ÀÄÄÄÄÁÄÄÄÄÙ ÀÄÄÄÄÁÄÄÄÄÙ
³ 1   0   0 ³  4800³ ³ 1   0   0 ³ MARK ³
³ 0   1   1 ³  2400³ ³ 0   1   1 ³ SPACE³
³ 0   1   0 ³  1200³ ³ 0   1   0 ³ UNDEF³
³ 0   0   1 ³   600³ ³ 0   0   1 ³ UNDEF³
³ 0   0   0 ³   300³ ³ 0   0   0 ³ UNDEF³
ÀÄÄÄÄÄÄÄÄÄÄÄÁÄÄÄÄÄÄÙ ÀÄÄÄÄÄÄÄÄÄÄÄÁÄÄÄÄÄÄÙ
```

Common settings:

BAUD	PARITY	DATA	STOP	bits 7 0	HEX value	Decimal value
38400	NONE	8	1	11111111	$FF	255
9600	NONE	8	1	10111111	$BF	191
1200	NONE	8	1	01011111	$5F	95
38400	EVEN	7	1	11110101	$F5	245
9600	EVEN	7	1	10110101	$B5	181
1200	EVEN	7	1	01010101	$55	85

ÀÄÄÄÄÄÄÄÁÄÄÄÄÄÄÄÄÄÄÄÁÄÄÄÄÄÄÄÄÄÄÁÄÄÄÄÄÄÄÄÄÄÁÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÁÄÄÄÄÄÄÄÄÄÄÄÄÁÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÙ

```
RS232 Assignment - "'RA',<channel>,'string'"
  This will cause string to be transmitted out the RS232 port when channel
  is turned on.  Any activity that turns channel on will cause the string to
  be sent (e.g. ON/TO/PULSE commands from the master, DC,PON,POF,
  CH, and SP commands)
     channel - 1 to 127.
  Data is store in NV Ram.

RS232 Assignment Kill - 'RK'
   This erases all RS232 assignments.

RS232 Assignment Channel Kill - "'RCK',<channel>"
   This erases the RS232 assignment for channel.

'SFON' - Serial Feedback On.  RS232 activity (both Rx and Tx) is
   indicated by the illumination of the IR In LED on the front panel.
   This setting is not saved when the device is reset.

'SFOF' - Serial Feedback On.  RS232 activity (both Rx and Tx) is
   not indicated by the illumination of the IR In LED on the front panel.
   This is the default state.


 ---------------------------------------------------------------------------
 SEND COMMANDS SPECIFIC TO CLOCK OPERATION - grouped by function
 ---------------------------------------------------------------------------

 --- COUNT DOWN TIMER COMMANDS ---

  'SETCT hh:mm:ss'
      Sets the countdown timer.

  'SHOWCT'
      Displays the count down timer.

  'STARTCT'
      Starts the count down timer.

  'STOPCT'
      Stops the count down timer.


 --- SCROLL COMMANDS ---

  'SREPEAT-ON'
      After this command is sent, any scroll command greater than 5
characters will
      repeat indefinitely in a loop until a "SHOW..." command or another
scroll command
      is sent.

  'SREPEAT-OFF'
      After this command is sent, any scroll command greater than 5
characters will
      not repeat.  This is the default mode.
```

'SCROLL-abcdefghijklmnopqrstuvw...'
Scrolls characters (32 max following the hyphen) across the display. If 5 or less
characters are sent, they are displayed stationary. Five or less characters
can be made to scroll by adding leading or trailing blanks. A scroll can be made to
appear as if it is beginning from off of the display by adding five leading blanks. A
scroll can be made to appear that it is stationary and then begins to move by
sending the first five characters of the string to the display, waiting and then
sending the entire string (including the first five characters).

Note that the TMX+ always handles scrolls (greater than five characters) in groups of 8
characters. It will append trailing blanks to scrolls until the total lenght reaches a
multiple of 8. This is only important to know when in scroll repeat mode (for aesthetics)
or when the timing of the receipt of the scroll ended channel is critical.

'SRATE X'
Sets the scroll rate where X = 1..255.

--- MISC COMMANDS ---

'BRIGHT X'
Sets the display brightness where X = 1..255.

-- STOP WATCH (ELAPSED TIMER) COMMANDS --

'CLEARSTP'
Clear (reset to 0) the stopwatch (elapsed timer).

'SHOWSTP'
Displays the stopwatch (elapsed) timer.

'STARTSTP'
Start the stopwatch (elapsed timer).

'STOPSTP'
Stop the stopwatch (elapsed timer).

--- TIME OF DAY RELATED COMMANDS ---

'CK12'
When SHOWCLK is active, time of day is displayed in 12 hour format.

'CK24'
When SHOWCLK is active, time of day is displayed in 24 hour format.

'CLOCK mm-dd-yy hh:mm:ss'
Sets the time of day. mm-dd-yy is ignored but spaces for this text must be maintained.
Note that this command is sent regularly by the master independent of the Axcess program
to keep the time current.

'SHOWCLK' Displays the current time of day.

TROUBLESHOOTING:
If the IR In LED on the front panel is blinking unexpectedly when no IR is present, issue
the 'SPOF' SEND COMMAND to make sure that it is not indicating RS232 activity (see the
'SPON' and 'SPOF' SEND COMMANDS above).

****
****

12 AXB-TMX+/TMC WITH RS-232 CONTROL

12.1 COMMANDS

(SEND_COMMAND DEV,"command")

The RS-232 control version is contained within the AXlink firmware (in both the boot and download
transfered via SOFTROM). Serial communication parameters are 9600,N,8,1. Note that this baud rate
is the same for when using SORTROM and IRLIB directly to the AXB-TMX+/TMC as a serial device.

HARDWARE:

To enter RS-232 control mode

1. Power down.
2. Set the device number on the dip switch to 0.
3. Position jumpers JP1 and JP2 across pins 2 and 3 (the position closest to the connector).
4. Connect a serial cable as follows (DB9 female to 4 pin Phoenix female):
a. DB9 pin 2 to Phoenix pin 2 (RS-232 TX/ AXP)
b. DB9 pin 3 to Phoenix pin 3 (RS-232 RX/ AXM)
c. DB9 pin 5 to Phoenix pin 4 (ground)

Note that this cable can be made by using FG10-756-01 as a basis and swapping the position
of the wires at the Phoenix end. In other words, swap pin 1 with pin 4 (originally a no-connect)
and pin 2 with pin 3.

5. Connect a two pin power connector to the AXB-TMX+/TMC.

SOFTWARE:

Set the PC communication parameters at 9600,N,8,1 for communication with the main AXlink/232
(4 pin Phoenix) port. The second 232 port (9 pin) parameters are software adjustable just like
in Axlink mode.

Both SOFTROM and IRLIB can be used with the TMX+/TMC in RS-232 control mode. In this mode, these
programs recognize the TMC as device number 1.

The same channels, SEND_COMMANDS, etc. that are used in AXlink communication are used in RS232
communication. They difference is in the formatting. The formatting follows that of the AXB-PCCOM
control protocol.

Note:
1. CHECKSUM = sum of all previous byte sent modulus 256

2. # BYTES   = number of bytes that follows excluding the checksum
3. Only characters in single quotes are ASCII, the rest are hexadecimal
4. STATUS: 1 = on, 0 = off
5. X = don't care
6. Received strings:
      A.) Strings may be preceeded by FE 02, depending on the setting of
             the 'BC' SEND_COMMAND
      B.) Pioneer barcodes are alway preceeded by FE 01

COMMUNICATION SENT TO THE AXB-TMX+/TMC:

DO PUSH/RELEASE	'*' <1> <0> <CHANNEL> <STATUS> <CHECKSUM>
SEND STRING	'*' <4> <0> <# BYTES> <STRING> <CHECKSUM>
SEND COMMAND	'*' <5> <0> <# BYTES> <STRING> <CHECKSUM>
GET BUSS STATUS	'*' <8> <CHECKSUM>
GET DEVICE	'*' <9> <CHECKSUM>
SET RESPONSE MASK	'*' <10> <MASK1> <X> <CHECKSUM>

see below for more information on the RESPONSE MASK*

COMMUNICATION FROM THE AXB-TMX+/TMC:

CHANNEL STATUS	'&' <1> <0> <CHANNEL> <STATUS> <CHECKSUM>
RECEIVE STRING	'&' <3> <0> <# BYTES> <STRING> <CHECKSUM>
BUSS STATUS	'&' <6> <STATUS> <CHECKSUM>
DEVICE LIST	'&' <7> <1> <1> <CHECKSUM>

---

*RESPONSE MASK
by default, data is sent when the AXB-TMX+/TMC gets a change.
Bits in the response mask can turn off sending of this data.
(1=ON)   DATA SENT
(0=OFF) DATA NOT SENT

MASK1:

BIT	DATA CONTROLLED	DEFAULT
7 (msb)	RECEIVE STRING	1
6	not used	X
5	CHANNEL CHANGE	1
4	not used	X
3	not used	X
2	not used	X
1	not used	X
0 (lsb)	not used	X

****
****

---

13 AXB-TM5 Television Manager

13.1 CHANNELS

CHANNEL	FUNCTION
1	while channel is on, generates IR/Serial function 1, else off
2-127	similar except for functions 2 through 127

Note: Turning another channel (IR/Serial function) on while one is currently on will automatically turn the current one off first

128-247	received IR code PUSH and RELEASE channels
248	a PUSH on this channel indicates power fail error (V1.30)
249	if this channel and 250 are on, Response LED will blink (V1.20)
250	while channel is on, front panel Response LED is on, else off
251	while channel is on, I/O 1 is on (switch to GND), else off
252	while channel is on, I/O 2 is on (switch to GND), else off
253	while channel is on, I/O 3 is on (switch to GND), else off
254	while channel is on, I/O 4 is on (switch to GND), else off

Note: Contact closure inputs on I/O 1 through I/O 4 will also generate PUSHes and RELEASEs on channels 251 through 254 respectively

255	channel is on if TV Power sensor is detecting horizontal scan

13.2 COMMANDS

(SEND_COMMAND DEV,"command")

```
"'RO',<offset>" sets incoming IR offset.  Offset is subtracted
   from the incoming IR code before sending to Master
"'DE',<time in tenth seconds>" sets the delay time that the TV power
   sensor must be stable before being considered changed.  Default
   is 1 second
"'DC',<IR in>,<IR out>" makes a direct connection whereby the IR
   function <IR out> is generated for as long as the <IR in> code is
   being received. The <Ir in> code PUSH and RELEASE is NOT sent to
   Master.  Maximum of 16 direct connects
'DK' deletes all DC direct connections

'CAROFF' Turn IR carrier off.                                (V2.22)
'CARON'  Turn IR carrier on.                                 (V2.22)

'?PTON'  Request the current PTON setting. The TV Manager    (v2.23)
   will respond with the string "'PTON',value" where value is
   time in tenth seconds.

'?PTOF'  Request the current PTOF setting. The TV Manager    (v2.23)
   will respond with the string "'PTOF',value" where value is
   time in tenth seconds.

'?CTON'  Request the current CTON setting. The TV Manager    (v2.23)
   will respond with the string "'CTON',value" where value is
   time in tenth seconds.
```

'?CTOF' Request the current CTOF setting. The TV Manager (v2.23)
   will respond with the string "'CTOF',value" where value is
   time in tenth seconds.

'?DE' Request the current DE setting. The TV Manager (v2.23)
   will respond with the string "'DE',value" where value is
   time in tenth seconds.

Up to 16 of the following commands will be buffered and performed in
  the order received:

'PON' turns on TV based on TV Power sensor. If sensor reads that TV
   is off then IR function 27 is generated in attempt to turn TV on.
   If 3 attempts fail, unit will continue executing commands in
   the buffer. If no commands are in the buffer, unit will continue
   to try until a 'POF' or 'POD' command is received. If unit fails
   to turn TV on, a PUSH and RELEASE on channel 248 is made to
   indicate a power failure error. If at any time the Power sensor
   reads that the TV is off (such as if one went to the front panel
   and turned it off), the unit will automatically attempt to turn
   TV back on. Channel 255 changes are disabled after receipt of
   this command
'POF' turns off TV based on TV Power sensor. If sensor reads that TV
   is on then IR function 28 is generated in attempt to turn TV off.
   If 3 attempts fail, unit will continue executing commands in
   the buffer. If no commands are in the buffer, unit will continue
   to try until a 'PON' or 'POD' command is received. If unit fails
   to turn TV off, a PUSH and RELEASE on channel 248 is made to
   indicate a power failure error. If at any time the Power sensor
   reads that the TV is on (such as if one went to the front panel
   and turned it on), the unit will automatically attempt to turn
   TV back off. Channel 255 changes are disabled after receipt of
   this command
'POD' disables previous 'PON' or 'POF' commands for forcing TV
   power. Channel 255 changes are enabled
"'PTON',<time in tenth seconds>" sets the IR Power on pulse time.
   Default time is 5 (.5 second). Time is stored in permanent
   memory until changed
"'PTOF',<time in tenth seconds>" sets the amount of off time after
   an IR Power on pulse before new IR pulses can be generated
   (gives TV time to power up and get ready). Default time is 15
   (1.5 seconds). Time is stored in permanent memory
"'CH',<TV channel>" generates the IR digit pulses necessary to
   select the TV channel specified. Channels below 100 are generated
   as two digit pulses, and if channel is >= 100 then IR function 127
   is generated for the one hundred digit. If IR function 21 exists
   (ENTER for TVs that have this function), then it will follow the
   digit pulses
"'CTON',<time in tenth seconds>" sets the IR on pulse time for the
   channel digits and 'SP' pulses. Default time is 5 (.5 second).
   Time is stored in permanent memory until changed
"'CTOF',<time in tenth seconds>" sets the IR off time between
   pulses for the channel digits and 'SP' commands. Default time
   is 5 (.5 second). Time is stored in permanent memory
"'SP',<IR out>" generates a single pulse of the specified IR
   function. Pulse times are set by 'CTON' and 'CTOF'
'PIN' Turn on function that will OR together IO1 and power sensor

to determine actual TV status. IO2 will follow 'PON' and 'POF' commands. The status of this function is stored in permanent memory until changed.

'PIF' Turn off 'PIN' feature.

'XCHM-<extended channel mode(0-3)>' Change the output pattern for the XCH send command.

Mode 0: [x][x]<x><enter>

Example: 'XCH 3' The resulting IR would be 3-enter.

Example: 'XCH 34' The resulting IR would be 3-4-enter.

Example: 'XCH 343' The resulting IR would be 3-4-3-enter.

Mode 1: <x><x><x><enter>

Example: 'XCH 3' The resulting IR would be 0-0-3-enter.

Example: 'XCH 34' The resulting IR would be 0-3-4-enter.

Example: 'XCH 343' The resulting IR would be 3-4-3-enter.

Mode 2: <x><x><x>

Example: 'XCH 3' The resulting IR would be 0-0-3.

Example: 'XCH 34' The resulting IR would be 0-3-4.

Example: 'XCH 343' The resulting IR would be 3-4-3.

Mode 3: [[100][100]....]<x><x>

Example: 'XCH 3' The resulting IR would be 0-3.

Example: 'XCH 34' The resulting IR would be 0-3-4.

Example: 'XCH 343' The resulting IR would be 100-100-100-4-3.

'XCH<Channel 0-999>' Produdes the IR according to the pattern set by the XCHM send command

14 AXB-TMX Television Manager

14.1 CHANNELS

CHANNEL	FUNCTION
1	while channel is on, generates IR/Serial function 1, else off
2-127	similar except for functions 2 through 127

Note: Turning another channel (IR/Serial function) on while one is currently on will automatically turn the current one off first

128-247	received IR code PUSH and RELEASE channels
248	a PUSH on this channel indicates power fail error (V1.30)
249	if this channel and 250 are on, Response LED will blink (V1.20)
250	while channel is on, front panel Response LED is on, else off
251	while channel is on, I/O 1 is on (switch to GND), else off
252	while channel is on, I/O 2 is on (switch to GND), else off
253	while channel is on, I/O 3 is on (switch to GND), else off
254	while channel is on, I/O 4 is on (switch to GND), else off

Note: Contact closure inputs on I/O 1 through I/O 4 will also generate PUSHes and RELEASEs on channels 251 through 254 respectively

255	channel is on if TV Power sensor is detecting horizontal scan

14.2 COMMANDS

(SEND_COMMAND DEV,"command")

```
'CARON' Turn the IR carier on (default).
'CAROFF' Turns the IR carrier off.
"'RO',<offset>" sets incoming IR offset.  Offset is subtracted
   from the incoming IR code before sending to Master
"'DE',<time in tenth seconds>" sets the delay time that the TV power
   sensor must be stable before being considered changed.  Default
   is 1 second
"'DC',<IR in>,<IR out>" makes a direct connection whereby the IR
   function <IR out> is generated for as long as the <IR in> code is
   being received. The <Ir in> code PUSH and RELEASE is NOT sent to
   Master.  Maximum of 16 direct connects
'DK' deletes all DC direct connections

'?PTON'  Request the current PTON setting. The TV Manager   (v2.28)
   will respond with the string "'PTON',value" where value is
   time in tenth seconds.

'?PTOF'  Request the current PTOF setting. The TV Manager   (v2.28)
   will respond with the string "'PTOF',value" where value is
   time in tenth seconds.

'?CTON'  Request the current CTON setting. The TV Manager   (v2.28)
   will respond with the string "'CTON',value" where value is
   time in tenth seconds.

'?CTOF'  Request the current CTOF setting. The TV Manager   (v2.28)
   will respond with the string "'CTOF',value" where value is
```

time in tenth seconds.

'?DE' Request the current DE setting. The TV Manager (v2.28)
will respond with the string "'DE',value" where value is
time in tenth seconds.

NOTE: All request SEND_COMMANDs respond with strings to the master.
If a RS232 device is also sending strings to the TMX, the AXCESS
code must be written to handle the mixing of the data between
the device and the TMX response strings in the buffer.

Up to 16 (64 V2.26) of the following commands will be buffered and performed in
the order received:

'PON' turns on TV based on TV Power sensor. If sensor reads that TV
is off then IR function 27 is generated in attempt to turn TV on.
If 3 attempts fail, unit will continue executing commands in
the buffer. If no commands are in the buffer, unit will continue
to try until a 'POF' or 'POD' command is received. If unit fails
to turn TV on, a PUSH and RELEASE on channel 248 is made to
indicate a power failure error. If at any time the Power sensor
reads that the TV is off (such as if one went to the front panel
and turned it off), the unit will automatically attempt to turn
TV back on. Channel 255 changes are disabled after receipt of
this command
'POF' turns off TV based on TV Power sensor. If sensor reads that TV
is on then IR function 28 is generated in attempt to turn TV off.
If 3 attempts fail, unit will continue executing commands in
the buffer. If no commands are in the buffer, unit will continue
to try until a 'PON' or 'POD' command is received. If unit fails
to turn TV off, a PUSH and RELEASE on channel 248 is made to
indicate a power failure error. If at any time the Power sensor
reads that the TV is on (such as if one went to the front panel
and turned it on), the unit will automatically attempt to turn
TV back off. Channel 255 changes are disabled after receipt of
this command
'POD' disables previous 'PON' or 'POF' commands for forcing TV
power. Channel 255 changes are enabled
"'PTON',<time in tenth seconds>" sets the IR Power on pulse time.
Default time is 5 (.5 second). Time is stored in permanent
memory until changed
"'PTOF',<time in tenth seconds>" sets the amount of off time after
an IR Power on pulse before new IR pulses can be generated
(gives TV time to power up and get ready). Default time is 15
(1.5 seconds). Time is stored in permanent memory
"'CH',<TV channel>" generates the IR digit pulses necessary to
select the TV channel specified. Channels below 100 are generated
as two digit pulses, and if channel is >= 100 then IR function 127
is generated for the one hundred digit. If IR function 21 exists
(ENTER for TVs that have this function), then it will follow the
digit pulses
"'CTON',<time in tenth seconds>" sets the IR on pulse time for the
channel digits and 'SP' pulses. Default time is 5 (.5 second).
Time is stored in permanent memory until changed
"'CTOF',<time in tenth seconds>" sets the IR off time between
pulses for the channel digits and 'SP' commands. Default time

is 5 (.5 second). Time is stored in permanent memory

"'SP',<IR out>" generates a single pulse of the specified IR function. Pulse times are set by 'CTON' and 'CTOF'

'PIN' Turn on function that will OR together IO1 and power sensor to determine actual TV status. IO2 will follow 'PON' and 'POF' commands. The status of this function is stored in permanent memory until changed.

'PIF' Turn off 'PIN' feature.

'XCHM-<extended channel mode(0-3)>' Change the output pattern for the XCH send command.

Mode 0: [x][x]<x><enter>
Example: 'XCH 3' The resulting IR would be 3-enter.
Example: 'XCH 34' The resulting IR would be 3-4-enter.
Example: 'XCH 343' The resulting IR would be 3-4-3-enter.

Mode 1: <x><x><x><enter>
Example: 'XCH 3' The resulting IR would be 0-0-3-enter.
Example: 'XCH 34' The resulting IR would be 0-3-4-enter.
Example: 'XCH 343' The resulting IR would be 3-4-3-enter.

Mode 2: <x><x><x>
Example: 'XCH 3' The resulting IR would be 0-0-3.
Example: 'XCH 34' The resulting IR would be 0-3-4.
Example: 'XCH 343' The resulting IR would be 3-4-3.

Mode 3: [[100][100]....]<x><x>
Example: 'XCH 3' The resulting IR would be 0-3.
Example: 'XCH 34' The resulting IR would be 0-3-4.
Example: 'XCH 343' The resulting IR would be 100-100-100-4-3.

'XCH<Channel 0-999>' Produdes the IR according to the pattern set by the XCHM send command.

RS232 commands (also buffered):

RS232 commands are buffered in the same buffer as the commands above. Each 2 characters in a string (applicable in the RA command) require 1 buffer location.

'BC' - Bar Code. When on, two header bytes are added to all RS232 strings coming into the TMC/TMX+. Turning this option off will eliminate these two bytes.

'BC' on:

```
ÚÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄ¿
³              BITS                ³
ÃÄÄÄÂÄÄÄÂÄÄÄÂÄÄÄÂÄÄÄÂÄÄÄÂÄÄÄÂÄÄÄÂÄÄÄÂÄÄÄÄ´
³ 7 ³ 6 ³ 5 ³ 4 ³ 3 ³ 2 ³ 1 ³ 0 ³
ÃÄÄÄÁÄÄÄÁÄÄÄÁÄÄÄÁÄÄÄÁÄÄÄÁÄÄÄÁÄÄÄÁÄÄÄÄ´
³ 1   1   1   1   1   1   1   1 ³
ÀÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÙ
```

'BC' off:

```
ÚÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄ¿
³              BITS                ³
ÃÄÄÄÂÄÄÄÂÄÄÄÂÄÄÄÂÄÄÄÂÄÄÄÂÄÄÄÂÄÄÄÂÄÄÄÂÄÄÄÄ´
³ 7 ³ 6 ³ 5 ³ 4 ³ 3 ³ 2 ³ 1 ³ 0 ³
ÃÄÄÄÁÄÄÄÁÄÄÄÁÄÄÄÁÄÄÄÁÄÄÄÁÄÄÄÁÄÄÄÁÄÄÄÄ´
```

```
     ³ 0   0   0   0   0   0   0   0 ³
     ÀÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÙ
```

RS232 Set UART - "'SU',<value>"

This will set the communication parameters.
Value is described below:

The combination of bits in value determine the baud rate, parity, data bits, and stop bits.

The bits of value:

```
ÚÄÄÄÄÂÄÄÄÄÂÄÄÄÄÂÄÄÄÄÂÄÄÄÄÂÄÄÄÄÂÄÄÄÄÂÄÄÄÄÂÄÄÄÄÂÄÄÄÄ¿
³  7 ³  6 ³  5 ³  4 ³  3 ³  2 ³  1 ³  0 ³
ÀÄÄÄÄÁÄÄÄÄÁÄÄÄÄÁÄÄÄÄÁÄÄÄÄÁÄÄÄÄÁÄÄÄÄÁÄÄÄÄÁÄÄÄÄÙ
ÀÄÄBAUD RATEÄÄÄÁÄÄÄÄPARITYÄÄÄÄÁDATAÁSTOPÙ
```

```
ÚÄÄÄÄÄÄÄÄÄÄÄÄÂÄÄÄÄÄÄÄ¿ ÚÄÄÄÄÄÄÄÄÄÄÄÄÂÄÄÄÄÄÄÄ¿ ÚÄÄÄÄÂÄÄÄÄ¿ ÚÄÄÄÄÂÄÄÄÄ¿
³   BITS    ³ BAUD ³ ³   BITS    ³PARITY³ ³BIT ³DATA³ ³BIT ³STOP³
ÃÄÄÄÄÂÄÄÄÄÂÄÄÄ´ RATE ³ ÃÄÄÄÄÂÄÄÄÄÂÄÄÄ´      ³ ÃÄÄÄÄ´BITS³ ÃÄÄÄÄ´BITS³
³ 7 ³ 6 ³ 5 ³      ³ ³ 4 ³ 3 ³ 2 ³      ³ ³ 1  ³    ³ ³ 0  ³    ³
ÃÄÄÄÄÁÄÄÄÄÁÄÄÄ´      ³ ÃÄÄÄÄÁÄÄÄÄÁÄÄÄ´      ³ ÃÄÄÄÄ´    ³ ÃÄÄÄÄ´    ³
³ 1   1   1 ³ 38400³ ³ 1   1   1 ³ NONE ³ ³ 1  ³ 8  ³ ³ 1  ³ 1  ³
³ 1   1   0 ³ 19200³ ³ 1   1   0 ³ ODD  ³ ³ 0  ³ 7  ³ ³ 0  ³ 2  ³
³ 1   0   1 ³  9600³ ³ 1   0   1 ³ EVEN ³ ÀÄÄÄÄÁÄÄÄÄÙ ÀÄÄÄÄÁÄÄÄÄÙ
³ 1   0   0 ³  4800³ ³ 1   0   0 ³ MARK ³
³ 0   1   1 ³  2400³ ³ 0   1   1 ³ SPACE³
³ 0   1   0 ³  1200³ ³ 0   1   0 ³ UNDEF³
³ 0   0   1 ³   600³ ³ 0   0   1 ³ UNDEF³
³ 0   0   0 ³   300³ ³ 0   0   0 ³ UNDEF³
ÀÄÄÄÄÄÄÄÄÄÄÄÄÁÄÄÄÄÄÄÄÙ ÀÄÄÄÄÄÄÄÄÄÄÄÄÁÄÄÄÄÄÄÄÙ
```

Common settings:

```
ÚÄÄÄÄÄÂÄÄÄÄÄÄÄÄÂÄÄÄÄÄÄÄÂÄÄÄÄÄÄÄÂÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÂÄÄÄÄÄÄÄÄÄÄÄÂÄÄÄÄÄÄÄÄÄÄÄÄ¿
³BAUD ³ PARITY ³ DATA ³ STOP ³bits 7     0 ³ HEX value³ Decimal value³
ÃÄÄÄÄÅÄÄÄÄÄÄÄÅÄÄÄÄÄÄÄÅÄÄÄÄÄÄÄÅÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÅÄÄÄÄÄÄÄÄÄÄÄÅÄÄÄÄÄÄÄÄÄÄÄÄ´
³38400³  NONE  ³  8  ³  1  ³     11111111³    $FF   ³     255      ³
³ 9600³  NONE  ³  8  ³  1  ³     10111111³    $BF   ³     191      ³
³ 1200³  NONE  ³  8  ³  1  ³     01011111³    $5F   ³      95      ³
³38400³  EVEN  ³  7  ³  1  ³     11110101³    $F5   ³     245      ³
³ 9600³  EVEN  ³  7  ³  1  ³     10110101³    $B5   ³     181      ³
³ 1200³  EVEN  ³  7  ³  1  ³     01010101³    $55   ³      85      ³
ÀÄÄÄÄÄÁÄÄÄÄÄÄÄÄÁÄÄÄÄÄÄÄÁÄÄÄÄÄÄÄÁÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÁÄÄÄÄÄÄÄÄÄÄÄÁÄÄÄÄÄÄÄÄÄÄÄÄÙ
```

RS232 Assignment - "'RA',<channel>,'string'"

This will cause string to be transmitted out the RS232 port when channel is turned on. Any activity that turns channel on will cause the string to be sent (e.g. ON/TO/PULSE commands from the master, DC,PON,POF, CH, and SP commands)

channel - 1 to 127.

Data is store in NV Ram.

RS232 Assignment Kill - 'RK'

This erases all RS232 assignments.

RS232 Assignment Channel Kill - "'RCK',<channel>"

This erases the RS232 assignment for channel.

15 AXB-TPI Touch Panel Interface (640x480, 800x600, 1024x768)

15.1 CHANNELS

CHANNEL	FUNCTION
1-255	Button Push and Feedback

15.2 COMMANDS

(SEND_COMMAND DEV,"command")

```
COLOR SEND_COMMANDS:

   Color Numbers: Light to Dark
    RED     :0-5           ORANGE  :6-11
    YELLOW  :12-17         LIME    :18-23
    GREEN   :24-29         AQUA    :30-35
    CYAN    :36-41         ROYAL   :42-47
    BLUE    :48-53         PURPLE  :54-59
    MAGENTA :60-65         PINK    :66-71
    WHITE   :72-77         GREY    :78-83
    MORE GREYS: 84-86
    BLACK   :87

    TRANSPARENT    255

-------------------------------------------------------------------------
 New command format starts with @
 Most commands are in what is known as "shorthand" format
 where the data is always one-byte non-ascii data except
 for pages, passwords, text and bitmap names.
-------------------------------------------------------------------------

    "'@CPG',<color_number>,'<page name>'"
        Sets the page with specified page name background color to the specified
        color only if the specified background color is not the same as the
        current color.

    "'@CPP',<color_number>,'<pop-up page name>'"
        Sets the page with specified pop-up page name background color to the
        specified color only if the specified background color is not the same
        as the current color.

    "'@CFN',<variable text address 1-255>,<color_number>"
        Fill Color On.
        Sets the fill color for ON feedback to the specified color only if the
        specified fill on color is not the same as the current color.

    "'@CFF',<variable text address 1-255>,<color_number>"
        Fill Color Off.
        Sets the fill color for OFF feedback to the specified color only if the
        specified fill off color is not the same as the current color.

    "'@CBN',<variable text address 1-255>,<color_number>"
```

Border Color On.
Sets the border color for ON feedback to the specified color only if the specified border on color is not the same as the current color.

"'@CBF',<variable text address 1-255>,<color_number>"
Border Color Off.
Sets the border color for OFF feedback to the specified color only if the specified border off color is not the same as the current color.

"'@CTN',<variable text address 1-255>,<color_number>"
Text Color On.
Sets the text color for ON feedback to the specified color only if the specified text on color is not the same as the current color.

"'@CTF',<variable text address 1-255>,<color_number>"
Text Color Off.
Sets the text color for OFF feedback to the specified color only if the specified text off color is not the same as the current color.

VARIABLE TEXT SEND_COMMANDS:

NOTE:DATA FOR ALL COMMANDS EXCEPT TEXT AND BITMAP
ARE SINGLE BYTE NON-ASCII DATA!!

"'@BMF',<variable text address 1-255>,'<data>'"

Set any/all button parameters by sending embedded codes and data.
Codes are:

'%B',<border 1-27,40,41>	Set Border
'%F',<font 1-8,32-xx>	Set Font
'%T',<text>	Set Text (empty is clear)
'%P',<bitmap>	Set Picture/Bitmap (empty is clear)
'%I',<icon 1-255, 0-clear>	Set Icon
'%J',<alignment of text 1-9>	Set text alignment using telephone Keypad layout (1 = left,top 5 = center,middle 9 = right,bottom)
'%C1',<on fill color>	Set On Fill Color
'%C2',<off fill color>	Set Off Fill Color
'%C3',<on border color>	Set On Border Color
'%C4',<off border color>	Set Off Border Color
'%C5',<on text color>	Set On Text Color
'%C6',<off text color>	Set Off Text Color

"'@SHO',<variable text address 1-255>,<ON/OFF 1-0>"
Turns Button On or Off (show/hide).

"'@ENA',<variable text address 1-255>,<ON/OFF 0-1>"
Enables Button On or Off (enable/disable).

"'@ICO',<variable text address 1-255>,<icon index 0-255>"
Set Icon, 0 is clear.

"'@BMP',<variable text address 1-255>,'<name of bitmap>'"

```
    Set Bitmap.

"'@TXT',<variable text address 1-255>,'<new text to be put in button>'"
    Set Text.

"'@UNI',<variable text address 1-255>,'<new text to be put in button>'"
    Set Unicode Text.

"'@JUS',<variable text address 1-255>,<new text alignment>"
    Set Text Alignment, use numeric keypad layout.
    (7 = Left Bottom, 3= Right Top).

"'@FON',<variable text address 1-255>,<font size 1-255>"
    Set Font.
    Fixed Fonts are as follows:
        1 = x-small
        2 = small
        4 = large
        5 = x-large
        6 = hollow medium
        8 = hollow x-large
    Variable Fonts start at 32.

"'@BOR',<variable text address 1-255>,<border style 0-41>"
    Set Border only if the specified border is not the same as the current
    border.
    Border styles are as follows:
    no_border             0
    no_border_special     1          3dim_rect_1           20
    single_line           2          3dim_rect_2           21
    double_line           3          3dim_round_1          22
    triple_line           4          3dim_round_2          23
    single_rounded        5          3dim_neon_1           24
    double_rounded        6          3dim_neon_2           25
    single_raised         7          3dim_neon_blue        26
    double_raised         8          3dim_neon_green       27
    triple_raised         9
    double_line_2_single  10         single_diamond        40
    double_line_3_single  11         double_diamond        41
    double_shadow         12

"'@BOS',<variable text address 1-255>,<slot_number>"
    Change Video Slot Option
    Sets the video window slot id to the new slot id only if the specified
    slot is not the same as the current slot selected.

-------------------------------------------------------------------------
  MISC. SEND COMMANDS:


"'@RES <horizontal_size>x<vertical_size>:<refresh_rate>'"
    Set the display output resolution and refresh rate only if the
    specified resolution and refresh rate are not the same as currently
    selected.

"'@MOU' <touch_type>"
    Set the serial touch interface type.
```

```
    Serial touch types are as follows:
    Touch Off               0
    MicroSoft Serial Mouse  1
    DynaPro Touch           10
    MicroTouch              11
    EloTouch                13

"'@RDW'"
    Redraw the current page.

"'@PWD-<page flip password>'"
    Set page flip password

"'@PRO-<protected setup password>'"
    Set protected setup password

"'@RPP'"
    Reset protected setup password back to default.

"'@PPN-<pop-up page name>;<page name>'"
    Activates a popup page with specified pop-up page name on page with
    specified specified page. If page name is empty, the current page is
    used.

"'@PPF-<pop-up page name>;<page name>'"
    Deactivates a popup page with specified pop-up page name on page with
    specified page. If page name is empty, the current page is used. If
    pop-up page is part of a group, the whole group is deactivated.

"'@PPK-<pop-up page name>'"
    Kill a popup page with specified pop-up page name from ALL pages. If
    pop-up page is part of a group, the whole group is deactivated.

"'@PPA-<page_name>'"
    Close all popups on a page.

"'@PPX'"
    Closes all popups on all pages.

"'@SWK-<string>'"
    Change Wakup string.

"'@SSL-<string>'"
    Change Sleep string.

"'@SST-<string>'"
    Change Startup string.

"'@IDF'"
    Identify file. The panel returns a string with the DOS file name of the
    panel file like this:
    "'IDF-<dos file name>'"

"'@IDP'"
    Identify project. The panel returns a string with the Project name of
    the panel file like this:
    "'IDP-<project name>'"
```

---

all old style commands

"'CPAGE<color_number>-<page name>'"
Sets the page with specified page name background color to the specified color.

"'CFON<variable text address 1-255>-<color_number>'"
Fill Color On.
Sets the fill color for ON feedback to the specified color only if the specified fill on color is not the same as the current color.

"'CFOFF<variable text address 1-255>-<color_number>'"
Fill Color Off.
Sets the fill color for OFF feedback to the specified color only if the specified fill off color is not the same as the current color.

"'CBON<variable text address 1-255>-<color_number>'"
Border Color On.
Sets the border color for ON feedback to the specified color only if the specified border on color is not the same as the current color.

"'CBOFF<variable text address 1-255>-<color_number>'"
Border Color Off.
Sets the border color for OFF feedback to the specified color only if the specified border off color is not the same as the current color.

"'CTON<variable text address 1-255>-<color_number>'"
Text Color On.
Sets the text color for ON feedback to the specified color only if the specified text on color is not the same as the current color.

"'CTOFF<variable text address 1-255>-<color_number>'"
Text Color Off.
Sets the text color for OFF feedback to the specified color only if the specified text off color is not the same as the current color.

"'CALL<variable text address 1-255>-<data>"
Sets All colors for button. The data is a series of 6 color_numbers in this order:

FILL COLOR ON
FILL COLOR OFF
BORDER COLOR ON
BORDER COLOR OFF
TEXT COLOR ON
TEXT COLOR OFF

Example:
"'CALL1-1 3 0 0 72 74'"
Sets Variable Text Button 1 to:
FILL COLOR ON - RED one shade from brightest
FILL COLOR OFF - RED three shades from brightest
BORDER COLOR ON - RED brightest
BORDER COLOR OFF - RED brightest
TEXT COLOR ON - WHITE brightest

TEXT COLOR OFF   - WHITE two shades from brightest

VARIABLE TEXT SEND_COMMANDS:

"'BTON<variable text address 1-255>'"
Turns specified button completely ON.

"'BTOF<variable text address 1-255>'"
Turns specified button OFF.

"'!B',<variable text address 1-255>,<ON/OFF 0-1>"
Turns Button On or Off.

"'!T',<variable text address 1-255>,'<new text to be put in button>'"
Shorthand and faster version of 'TEXT' command.
"'TEXT<variable text address 1-255>-<new text to be put in button>'"
Changes text in specified text button number.
A '|' character indicates a carriage return to begin next line down.
All text remains permanent even during power outage until changed with another TEXT command.
Example of usage:

"'TEXT2-VCR|PLAY'" changes text button number 2 to display:

```
------
| VCR  |
| PLAY |
------
```

"'!F',<variable text address 1-255>,'<font size 1-255>'"
Shorthand and faster version of 'FONT' command.
"'FONT<variable text address 1-255>-<font size 1-255>'"
Changes font size (or style) of the text in specified text button number.
Fixed Fonts are as follows:
1 = x-small
2 = small
4 = large
5 = x-large
6 = hollow medium
8 = hollow x-large
Variable Fonts start at 32.

"'!I',<variable text address 1-255>,'<border style 0-41>'"
Shorthand and faster version of 'ICON' command.
"'ICON<variable text address 1-255>-<border style 0-41>'"
Changes border style of the specified text button number.
Border styles are as follows:

no_border	0		
no_border_special	1	3dim_rect_1	20
single_line	2	3dim_rect_2	21
double_line	3	3dim_round_1	22
triple_line	4	3dim_round_2	23
single_rounded	5	3dim_neon_1	24
double_rounded	6	3dim_neon_2	25
single_raised	7	3dim_neon_blue	26
double_raised	8	3dim_neon_green	27
triple_raised	9		
double_line_2_single	10	single_diamond	40
double_line_3_single	11	double_diamond	41

```
        double_shadow         12

        Example of usage:
         "'ICON25-6'"
         Changes border style of text button number 25 to double rounded.

    "'!C',<variable text address 1-255>,<border style 0-41>,<font>,
          '<new text to be put in button>'"
        Combination command that will set border,font,and text in one
        shorthand command.
        NOTE: border style and font are single byte non-ascii data!!

-------------------------------------------------------------------------
  MISC. SEND COMMANDS:

    "'MOUSE <mouse type>'"
        Set the serial touch interface type.
        Serial touch types are as follows: (there is no turn off with this
            command)
        MicroSoft Serial Mouse  0
        MicroSoft Serial Mouse  1
        DynaPro Touch           10
        MicroTouch              11
        EloTouch                13


    "'PAGE-<page name>'"
        Flips to page with specified page name.
        Example of usage:
         "'PAGE-MAIN'" flips to a page named MAIN on the panel.

    "'PPON-<page name>'"
        Activates a popup page with specified page name.
        Example of usage:
         "'PPON-TRANS'" Activates popup page named TRANS on the panel.

    "'PPOF-<page name>'"
        Deactivates a popup page with specified page name.
        Example of usage:
         "'PPOF-TRANS'" Deactivates popup page named TRANS on the panel.

    "'SETUP'"
        Sends panel to SETUP page.

    "'TPAGEON'"
        Turns on page tracking, whereby when the page changes, a string is sent
        to the Master in the format "'PAGE-<page name>'". This string may be
        captured with a CREATE_BUFFER command for one panel and sent directly to
        another panel because it is in the format of a "'PAGE-'" command.

       Example of usage:
         DEFINE_VARIABLE
           TP1_BUF[25]
         DEFINE_START
           CREATE_BUFFER TP1,TP1_BUF
         DEFINE_PROGRAM
         IF(LENGTH_STRING(TP1_BUF))  (* See if we got string from TP1 *)
```

```
        {
        SEND_COMMAND TP2,TP1_BUF  (* Make TP2 page track TP1 *)
        TP1_BUF=''  (* Clear string buffer *)
        }

"'TPAGEOFF'"
    Turns off page tracking.


"'AKEYB-<inital text>'"
     Pops up the keyboard icon and intializes the text string to that
     specified. Keyboard string is set to null on power up and is stored
     until power is lost.

"'AKEYP-<inital text>'"
    Pops up the keypad icon and intializes the text string to that
    specified. Keypad string is set to null on power up and is stored until
    power is lost.

"'AKEYR'"
    Remove keyboard or keypad that was displayed using "'AKEYB'", "'AKEYP'",
    or "'PKEYP'" commands.

"'PKEYP-<inital text>'"
    Private Keypad.
    Pops up the keypad icon and intializes the text string to that
    specified. Keypad displays a '*' instead of the numbers typed.

"'BEEP'"
    Outputs a beep.

"'ABEEP'"
    Outputs a beep duration 1 even if beep is off.

"'DBEEP'"
    Outputs a double beep.

"'ADBEEP'"
    Outputs a double beep even if beep is off.

"'QBEEP'"
    Stops ALL beeps, including "'ABEEP'", "'ADBEEP'", and AXlink beeps.

"'WAKE'"
    Forces panel out of screen saver mode.

"'SLEEP'"
    Forces panel into screen saver mode.

"'CLOCK mm-dd-yy hh:mm:ss'"
    Sets the time and date on the panel.

    Example of usage:
     "'CLOCK 01-08-93 19:16:00'"
     Sets the time to 7:16 PM and date to January 8, 1993

"'RESET'"
```

```
        Clears all panel status (same as power up), NOT memory.

    "'ZAP!'"
        Clears all memory (erases all buttons, pages, icons, fonts, and
        bitmaps).

    "'CALIBRATE'"
        Enters calibrate sequence immediately.

-------------------------------------------------------------------------
  VIDEO COMMANDS:

    "'@VBR <New setting in ascii> <slot_number>'"
        Video Signal Brightness   0-255.

    "'@VCT <New setting in ascii> <slot_number>'"
        Video Signal Contrast 0-255.

    "'@VST <New setting in ascii> <slot_number>'"
        Video Signal Saturation  0-255.

    "'@VHU <New setting in ascii> <slot_number>'"
        Video Signal Hue  0-255.

    "'@VDI <New setting in ascii> <slot_number>'"
    "'VIDI-<0-1> <slot_number>'"
        Video Interlaced '1' or NonInterlaced '0'.

    "'@VBW <New setting in ascii> <slot_number>'"
        Video Black & White Input  Color 0 or Black & White 1.

    "'@VSD <slot_number>'"
        Video Default Settings (Brightness, Contrast, Saturation, Hue,
        Interlace).

    "'@VDD <New setting in ascii> <slot_number>'"
        Video setting for auto or manual video standard detection.
        Video standard settings are as follows:
            Auto Detect Standard    1
            NTSC Manual Set         2
            PAL Manual Set          3
            Secam Manual Set        4

    "'@VIS <input_selected> <slot_number>'"
        Change video card input select.

-------------------------------------------------------------------------
  VGA COMMANDS:

    "'VGRC <New setting in ascii> <slot_number>'"
        VGA Signal Strength RED   0-255.

    "'VGGC <New setting in ascii> <slot_number>'"
        VGA Signal Strength GREEN 0-255.

    "'VGBC <New setting in ascii> <slot_number>'"
        VGA Signal Strength BLUE  0-255.
```

```
    "'VGCP <New setting in ascii> <slot_number>'"
        VGA Tracking 0-31.

    "'VGHS <New setting in ascii> <slot_number>'"
        VGA Horizontal Size       0-255.

    "'VGHP <New setting in ascii> <slot_number>'"
        VGA Horizontal Position   0-255.

    "'VGVP <New setting in ascii> <slot_number>'"
        VGA Vertical Position     0-255.

    "'VGSD <slot_number>'"
        VGA Default Settings (Colors, position, size).

-------------------------------------------------------------------------------
-------------------------------------------------------------------------------
```

16 AXB-PCCOM AXLINK TO RS232 INTERFACE

16.1 COMMANDS

(SEND_COMMAND DEV,"command")

```
 'RXON'  -  Enables strings to be sent to master.
 'RXOFF' -  Disables strings to be sent to master.
 'LEVON' -  Enables levels to be sent to master.
 'LEVOFF'-  Disables levels to be sent to master.

 'PASS ON' - PCCOM is put into PASS mode where any string sent from master
             while be sent without protocol formatting, and any string
             received will be sent to master without protocol checking.
             The PCCOM will act like an AXC-232 card with the capability
             to only send and receive strings.
 'PASS OFF'- Turns off PASS mode.  PCCOM operates normally.
 'SS-'     - Allows a RAW string to be sent from the PCCOM.  Any characters
             after the '-' would be sent without PCCOM protocol formatting.

       Example:
           SEND_COMMAND PCCOM,"'SS-ATDT 9 644 3048',13"
           The PCCOM would send the string "'ATDT 9 644 3048',13"
           which could be used to dial a modem connected to PCCOM.

AXB-PCCOM CONTROL PROTOCOL
GENERAL FORMAT:
 BYTE #
   1    ATTENTION BYTE
   2    COMMAND #
   3    DATA
 LAST  CHECKSUM, SUM OF ALL BYTES MOD 256
------------------------------------------------------------------------
REQUESTS SENT TO AXB-PCCOM
NOTES: 1 -  DEVICE is a offset from the AXB-PCCOM device code.
            DEVICE should be zero unless the AXB-PCCOM is configured
            for multiple devices.
       2 - Valid <LEVEL NO> are 0-7.

 DO PUSH/RELEASE      '*' <1>  <DEVICE> <CHANNEL> <STATUS> <CHECKSUM>
 PULSE PUSH/RELEASE   '*' <2>  <DEVICE> <CHANNEL> <CHECKSUM>
 SET LEVEL (byte)     '*' <3>  <DEVICE> <LEVEL NO> <LEVEL> <CHECKSUM>
 SEND STRING          '*' <4>  <DEVICE> <# BYTES> <STRING> <CHECKSUM>
 SEND COMMAND         '*' <5>  <DEVICE> <# BYTES> <STRING> <CHECKSUM>
 GET CHANNEL STATUS   '*' <6>  <DEVICE> <CHANNEL> <CHECKSUM>
 GET LEVEL STATUS     '*' <7>  <DEVICE> <LEVEL> <CHECKSUM>
 GET BUSS STATUS      '*' <8>  <CHECKSUM>
 GET DEVICE(s)        '*' <9>  <CHECKSUM>
 SET RESPONSE MASK    '*' <10> <MASK1> <MASK2> <CHECKSUM>
 SEND ALL ON CHANNELS '*' <11> <DEVICE> <CHECKSUM>
 SEND ALL LEVELS      '*' <12> <DEVICE> <CHECKSUM>
 SET LEVEL (word)     '*' <13> <DEVICE><LEVEL NO><LEVEL_H><LEVEL_L><CHECKSUM>

------------------------------------------------------------------------
RETURN/RESPOND STRINGS FROM AXB-PCCOM:
NOTES: 1 -  DEVICE is a offset from the AXB-PCCOM device code.
```

```
            DEVICE should be zero unless the AXB-PCCOM is configured
            for multiple devices.
       2 -  Valid <LEVEL NO> are 0-7.

 CHANNEL STATUS        '&' <1>   <DEVICE> <CHANNEL> <STATUS> <CHECKSUM>
 CHANGE LEVEL          '&' <2>   <DEVICE> <LEVEL NO> <LEVEL> <CHECKSUM>
 RECEIVE STRING        '&' <3>   <DEVICE> <# BYTES> <STRING> <CHECKSUM>
 RECEIVE COMMAND       '&' <4>   <DEVICE> <# BYTES> <STRING> <CHECKSUM>
 BUSS LED STATUS       '&' <5>   <STATUS> <CHECKSUM>
 BUSS STATUS           '&' <6>   <STATUS> <CHECKSUM>
    When AXLink is reset, BUSS STATUS is sent without being queried,
    When AXLink goes back on-line, BUSS STATUS is sent again.
 DEVICE LIST           '&' <7>   <# DEVICES> <DEVICES> <CHECKSUM>
-------------------------------------------------------------------------
RESPONSE MASK
DATA is automatically sent if the AXB-PCCOM gets a change.
This can be disabled and should be if the data is not used.
Bits in the response mask will turn off data
 (1=ON)   DATA SENT
 (0=OFF)  DATA NOT SENT
 NOTE: BUSS LED CHANGE DEFAULTS TO OFF

BIT      DATA CONTROLLED      DEFAULT
1st BYTE (MASK1)
 7 (msb) RECEIVE STRING        1
 6       RECEIVE COMMAND       1
 5       CHANNEL CHANGE        1
 4       LEVEL CHANGE          1
 3       BUSS LED              0
 2       (future)              0
 1       (future)              0
 0 (lsb) (future)              0
2nd BYTE (MASK2)
 7 (msb) (future)              0
 6       (future)              0
 5       (future)              0
 4       (future)              0
 3       (future)              0
 2       (future)              0
 1       (future)              0
 0 (lsb) (future)              0

-------------------------------------------------------------------------
```

the initial channel stops transmitting and the second channel starts transmitting.)

17.1 CHANNELS

CHANNEL	FUNCTION
9	Toggle power on and off
10 - 19	Digits 0 - 9
22	Channel up
23	Channel down
24	Increase volume
25	Decrease volume
26	Toggle audio mute on and off
27	Power on television
28	Power off television
128-240	IR inputs
248	Power fail (TV state is opposite of 'POF' or 'PON' command)
255	Channel is on when the television power on. The channel is disabled after the television controller receives a 'POF' (power off) or 'POD' (disable 'POF') command.

17.2 COMMANDS

(SEND_COMMAND DEV,"command")

```
"'CH',<Channel>"
  <Channel> = 0-199
  Set the television to go to the <Channel> number.
  Example:
  SEND_COMMAND,"'CH',25"
  Sets the television channel to 25.

"'CTOF',<Time>"
  <Time> = 0-255
  Set the single IR pulse's off time between each pulse. (See the 'SP'
  command.) Time is stored in permanent memory. System default is 5
  (.5 second).
  Example:
  SEND_COMMAND,"'CTOF',10"
  Sets the off-time pulse time (delay) to 1 second.

"'CTON',<Time>"
  <Time> = 0-255
  Set the single IR pulse's on time between each pulse. (See the 'SP'
  command.) Time is stored in permanent memory. System default is 5
  (.5 second).
  Example:
  SEND_COMMAND,"'CTON',20"
  Sets the single IR pulse's on time between each pulse to 2 seconds.

"'DC',<IR in>,<Control Channel>"
  <IR in> = custom IR function assigned to hand-held IR transmitting device
  <Control Channel> = channel number (see Figure 13)
  Set a direct connection so the control channel data transmits while the
  <IR in> code is received. The PUSH and RELEASE for the <IR in> code is not
```

sent to the AXC-EM. The maximum number of direct connections is 16.
Example:
SEND_COMMAND TM,"'DC',145,24"
Increases the volume.

'DK'
Delete all direct connections set with the 'DC' command. Use this command before programming a new set of direct connects.

'FRONT-OFF'
Disables control via the buttons on the front of the television.

'FRONT-ON'
Enable control via the buttons on the front of the television. (This is the default.)

'POD'
Disable current 'PON' (power on) or 'POF' (power off) command settings. Channel 255 changes are enabled.

'POF'
Send IR function 28 to turn device power off. If the device is turned on manually, this command turns television power off unless the television controller receives a 'PON' (power on) or 'POD' (disable 'POF') command. Channel 255 (power status) is not updated after executing this command.

'PON'
Turn the television's power on. If the device is turned off manually, this command turns television power on unless the television controller receives a 'POF' (power off) or 'POD' (disable 'PON' command) command. Channel 255 (power status) is not updated after executing this command.

'REM OFF'
Disable control by the Philips remote control.

'REM ON'
Enable control by the Philips remote control. (This is the default.)

"'RO',<Offset>"
<Offset> = 0-255
Set the offset value subtracted from the IR function before sending the code to the AXC-EM on channels 128-240.
Example:
SEND_COMMAND TM,"'RO',5"
Subtracts 5 from the incoming IR code number and sends the appropriate IR function to the AXC-EM.
Default = 0

added v3.00
"'SETCC',<CC mode>"
<CC mode> = 0-8 (see CC Mode table below)
Sets the Closed Caption mode for the television.
Example:
SEND_COMMAND,"'SETCC',1"
Sets the Closed Caption mode to 1 (Caption Channel 1 - Field 1)

CC MODE TABLE

```
        0 - "OFF" (no closed captioning)
        1 - "CC1" (Caption Channel 1 - Field 1)
        2 - "CC2" (Caption Channel 2 - Field 1)
        3 - "CC3" (Caption Channel 1 - Field 2)
        4 - "CC1" (Caption Channel 2 - Field 2)
        5 - "TEXT1" (Text Channel 1 - Field 1)
        6 - "TEXT2" (Text Channel 2 - Field 1)
        7 - "TEXT3" (Text Channel 1 - Field 2)
        8 - "TEXT4" (Text Channel 2 - Field 2)

        Note (according to Philips):
                Commercial Specification:  A reset of power will return the
closed captioning mode
                   to off.
                Hospital Specification:    Closed captioning mode will be
retained during a power
                   reset.

        Note: The TV chasis must be capable of displaying closed captioning for
this command
                   to work.

    "'SP',<Channel>"
      <Channel> = see Figure 13 for channel settings
      Generate a single <channel> function pulse. The 'CTON' (pulse on) and
      'CTOF' (pulse off) commands set the pulse time.
      Example:
      SEND_COMMAND TM,"'SP',27"
      Turns the television on.

added below v3.00
*******************************************************************************
*
* ON-SCREEN-TEXT-DISPLAY RELATED SEND COMMANDS
*
*******************************************************************************
   Note:
      The protocol for these commands is based on that of the AXB-VTI6 Video
Text Interface.
      Not all TV chassis support all commands.


   Protocol formatting is as follows:

          <ATTENTION BYTE> <CHANNEL> <COMMAND TYPE> <COMMAND> <DATA>

          ATTENTION BYTE = '!'
          CHANNEL        = 1 (always for the AXB-PSC)
          COMMAND TYPE   = BASIC TEXT (5) or SETUP (6)
          COMMAND        = SEE BELOW
          DATA           = SEE BELOW


* -----------------------------------------------------------------------------
* BASIC TEXT COMMAND TYPE
* -----------------------------------------------------------------------------
   NOTE:
```

Valid line options are 1 to 4
Each line can hold a total of 29 printable and control characters in memory (this is not the
amount that will fit across the screen). Control characters are explained below.
Basic Text Commands send their information to memory. The "DISPLAY ON" command (see below)
has to be issued for the text and formatting to appear on screen.

LINE TEXT
'!',1,5,1,<LINE NUM>,<TEXT>

Set the text and (optionally) control characters for the line.

Example 1: SEND_COMMAND,"'!',1,5,1,2,'Hello'"
Writes the text 'Hello' to line 2 of text memory.

Example 2: SEND_COMMAND,"'!',1,5,1,2,'Hello and',$86,$B0,'WELCOME'" ($86 = 134, $B0 = 176)
Writes the text 'Hello and WELCOME' to line 2 memory with "WELCOME" having a text color of
black and a character background color of white. "Hello and" has the colors specified by the
"TEXT COLOR, TEXT BORDER ON/OFF, TEXT BACKGROUND COLOR" command (see below).

In the above example, $86 and $BO are CONTROL CHARACTERS. Two types of control characters are
allowed:
1) SET TEXT COLOR: <101B><color nibble>
2) SET BACKGROUND COLOR: <100B><color nibble>

Where bit B = 0: transparent character background
1: current character background active

See color table below for color nibble.

Note (according to Philips):
The "SET TEXT COLOR" command will insert a blank space on certain TV chassis models.
The "SET BACKGROUND COLOR" command will always insert a blank space in the displayed
text with the color chnge occurring at the middle of the space.

Philips lists its display character set as seen below. AMX experience is that lower
case characters also can be displayed.

LINE SIZE
'!',1,5,2,<LINE NUM>,<CHAR SIZE>

<CHAR SIZE> 0: DEFAULT = NORMAL
1: DOUBLE HIGH AND DOUBLE WIDE

Set the character size for the line.
Example:
SEND_COMMAND,"'!',1,5,2,3,1
Sets line 3 size as double high and double wide in memory.

TEXT COLOR, TEXT BORDER ON/OFF, TEXT BACKGROUND COLOR
'!',1,5,10 <LINE NUM>,<TEXT COLOR>,<TEXT BORDER ON/OFF>,<TEXT BACKGROUND COLOR>

Note: if the border or background color parameter are not specified, default values are used.

<TEXT COLOR> SEE COLOR TABLE BELOW
DEFAULT = 7 = WHITE

<TEXT BORDER> 0: NO BLACK BORDER (OUTLINE OR "FRINGE") AROUND CHARACTERS
1: DEFAULT = BLACK BORDER (OUTLINE OR "FRINGE") AROUND CHARACTERS

<TEXT BACKGROUND COLOR>
THE COLORED BOX SURROUNDING EACH CHARACTER
SEE COLOR TABLE BELOW
DEFAULT = 4 = BLUE

Example:
SEND_COMMAND,"'!',1,5,10,1,6,1,7
Sets text indigo, text border on, and text background as white in line 1 of text memory.

* ----------
* SETUP COMMAND TYPE
* ----------

VIDEO vs BLANK SCREEN
'!',1,6,3 <VIDEO vs BLANK SCREEN>

<VIDEO vs BLANK SCREEN>
0: DEFAULT = VIDEO
1: BLANK SCREEN

Sets the entire screen either the normal video signal or an internally generated blank screen. The "DISPLAY ON" command (see below) must be issued for this command
to take effect.
Example: SEND_COMMAND,"'!',1,6,3,1 Sets the entire video background as an internally generated blank screen.

DISPLAY CLEAR
'!',1,6,6

Clears the text and formatting in memory. Does not clear the text and formatting presently

```
      on the screen.
      Example:
      SEND_COMMAND,"'!',1,6,6
      Clears the text and formatting in memory.  Does not clear the text and
formatting presently
      on the screen.


   DISPLAY ON
      '!',1,6,7,<TIME>

      <TIME>
         1-255 SECONDS
         If no time parameter is specified , the display will be on until it is
turned off with the
         "DISPLAY OFF" command below.

      Displays text memory contents on the screen for the time specified.
      Example:
      SEND_COMMAND,"'!',1,6,7,15
      Displays on the screen what is in the text memory.  Removes the text after
15 seconds


   DISPLAY OFF
      '!',1,6,8

      Clears the text presently on the screen.  Does not clear the text and
formatting in memory.
      Example:
      SEND_COMMAND,"'!',1,6,8
      Clears the text presently on the screen.  Does not clear the text and
formatting in memory.


* ---------------------------------------------------------------------------
* COLOR TABLE
* ---------------------------------------------------------------------------

                                  0  - Black
                                  1  - Red
                                  2  - Green
                                  3  - Yellow
                                  4  - Blue
                                  5  - Violet
                                  6  - Indigo
                                  7  - White

* ---------------------------------------------------------------------------
* DISPLAY TEXT CHARACTER SET
* ---------------------------------------------------------------------------
        Philips lists its display character set as shown.  AMX experience is
that lower
        case characters also can be displayed.

         - TO BE ADDED -
```

18 AXB-VOL3 Volume Box

18.1 CHANNELS

CHANNEL	FUNCTION
1	while channel is on, ramps volume channels 1 and 2 up (increase)
2	while channel is on, ramps volume channels 1 and 2 down (decrease)
3	while channel is on, volume channels 1 and 2 are muted (lowest volume), and when channel is turned off volume levels are restored to previous levels
4	while channel is on, ramps volume channel 1 up
5	while channel is on, ramps volume channel 1 down
6	while channel is on, volume channel 1 is muted (lowest volume), and when channel is turned off volume level is restored
7	while channel is on, ramps volume channel 2 up
8	while channel is on, ramps volume channel 2 down
9	while channel is on, volume channel 2 is muted (lowest volume), and when channel is turned off volume level is restored
10	while channel is on, ramps volume channel 3 up
11	while channel is on, ramps volume channel 3 down
12	while channel is on, volume channel 3 is muted (lowest volume), and when channel is turned off volume level is restored

Note: Ramping a volume channel while the mute channel is on will NOT automatically turn off the mute channel (will not restore) but the ramping will still occur and the volume change will be noticed when the mute channel is turned off. For setting ramp rates and presets, see SEND_COMMAND programming instructions for this card. For reading current volume levels and displaying bargraphs see CREATE_LEVEL and SEND_LEVEL programming instructions. Volume channels 1 through 3 use levels 1 to 3 respectively.

Levels

1 = Output #1
2 = Output #2
3 = Output #3

18.2 COMMANDS

(SEND_COMMAND DEV,"command")

```
'P<output channel 0-3>L<level 0-255|0-100%>[T<time 0-255 in tenth
   seconds]'

     Output channel 0 means both channels 1 and 2.  Level 0 is
     lowest volume (same as mute) and 255 or 100% is maximum volume

     Ramps specified channel(s) from current level to a specified
     preset level or percentage at the current rate or optionally
```

```
        in a specified amount of time

      Example of usage:

        'P0L50%' ramps both channels to 50% mid level volume at the
           current ramp rate
        'P1L255T20' ramps channel 1 to highest level volume in 2 seconds

  'P<output channel 0-3>R<time 0-255 in tenth seconds>[U|D]'
     Sets the ramp rate of the specified channel(s) where the time is
     the time to ramp the full range both down to up and up to down or
     optionally just down to up or just up to down

     Example of usage:
       'P0R50' sets ramp rate of channels 1 and 2 to 5 seconds full
          range from down to up and up to down
       'P3R50D' sets ramp rate of channel 3 to 5 seconds full range
          from up to down only

  'P1=P2' sets channel 1 level to the same as channel 2
  'P1=P3' sets channel 1 level to the same as channel 3
  'P2=P1' sets channel 2 level to the same as channel 1
  'P2=P3' sets channel 2 level to the same as channel 3
  'P3=P1' sets channel 3 level to the same as channel 1
  'P3=P2' sets channel 3 level to the same as channel 2
          Note: Cannot use 'P0' with these commands.

--------------------------------------------------------------------------------
```

19 AXCENT II Integrated AXCESS System

19.1 CHANNELS

CHANNEL	FUNCTION
RS232/422/485 devices:	
255	CTS push channel.
255	Reflects the state of the CTS input if a 'CTSPSH' command was sent to the device.
IR devices: 1-253	IR commands.
254	Power Fail. (Used with 'PON' and 'POF' commands.)
255	Power status.(Shadowed with I/O Link channel status.)
IO device:	
1-6	I/O channel.

19.2 COMMANDS

(SEND_COMMAND 0,"command")

```
MASTER:

'CLOCK mm-dd-yy hh:mm:ss' sets the time and date.

   Example:
   'CLOCK 01-08-93 19:16:00' sets the time to 7:16 PM and date
       to January 8, 1993

'COMP' Sends COMPARE DEVICE strings to requesting device.
'MASN' Sending device is turning Master Mode On.
'MASF' Sending device is turning Master Mode Off.

"'RDS',dev,string" re-directs a string to the device specified in dev.
"'RDC',dev,command" re-directs a command to the device specified in dev.

   Examples:
   SEND_COMMAND 0,"'RDS',200,'HELLO'"
     same as SEND_STRING 200,'HELLO' in axcess.
   SEND_COMMAND 0,"'RDC',200,'PAGE-MAIN PAGE'"
     same as SEND_COMMAND 200,'PAGE-MAIN PAGE' in axcess.

 'SHOW XXX' Sends SHOW DEVICE strings to requesting device starting
            at device XXX.

 Note: If a Send_Command to the master starts with an ESC, the second
       byte is used as the requesting device instead of the device
       that sent the command.  The command is then assumed to begin
       with the third byte.

RS232/422 devices 1-4:

'RXON' enables card to send incoming received characters to Master.
   This command is automatically sent by Master when a
   'CREATE_BUFFER' program instruction is executed
'RXOFF' (default) card will not pass on received characters to
   Master
'RXCLR' any characters waiting in the receive buffer waiting to be
   sent to Master will be cleared                (v3.620)
```

'TXCLR' any characters waiting in the transmit out buffer will
be cleared and transmission will stop (v3.620)
'B9MON' enables a special 9 data bits with 1 stop bit mode which
overrides the DIP switch settings for number of data, stop, and
parity bits. The baud rate is locked on at the current DIP switch
setting on issuance of this command
'B9MOFF' (default) sets data bits mode to normal with DIP switch
setting
'HSOFF' (default) hardware handshaking disabled. (Device 4 only)
'HSON' enable hardware handshaking (Device 4 only)
'XOFF' (default) software handshaking disabled
'XON' enable software handshaking
'CHARD-<time in 100 microsecond increments 0-255>' sets delay between
all transmitted characters to that specified

Example of usage:
'CHARD-10' sets 1mS delay between all transmitted characters
'CHARDM<time in 1 millisecond increments 0-255>' sets delay between
all transmitted characters to that specified

Example of usage:
'CHARDM10' sets 10mS delay between all transmitted characters
'CTSPSH' enables PUSHes and RELEASEs and status on Device 4 channel 255
for CTS hardware handshake input. If CTS is high, then channel
is on. (added V3.731)

SEND_STRINGs:

This card also has some special SEND_STRING escape sequences:

If any of the 3 character combinations below are found anywhere within
a SEND_STRING program instruction, they will be treated as a command
and not the literal characters:

* "27,17,<time in 100 microsecond increments 1-255>" sends a
break character of the specified length of time
* "27,18,1" sets the 9th data bit to 1 for all subsequent characters
to be transmitted. Used in conjunction with the 'B9MON' command
* "27,18,0" clears the 9th data bit to 0 for all subsequent characters
to be transmitted. Used in conjunction with the 'B9MON' command
* "27,19,<time in 1 millisecond increments 1-255>" inserts a
delay before the next character to be transmitted
* "27,20,0" un-asserts RTS hardware handshake output high (Device 4)
* "27,20,1" asserts RTS hardware handshake output low (Device 4)

IR/Serial devices 6-13:

"'CH',<channel>" sends IR pulses to select channel.
All channel below 100 are two digits.
If the IR code for ENTER (#21) is loaded a enter will follow
the number.
If the channel is >= 100 then IR fn 127 is generated for the one
hundred digit.
"'CTON',<time>" sets 'CH' pulse on time in tenths of second.
"'CTOF',<time>" sets 'CH' pulse off time in tenths of second.
Default time is .5 seconds.
Time is store in NV Ram.

"'SP',<code>" send single IR pulse.
Uses CTON and CTOF times for pulse times.

"'CP',<code>" same as 'SP' but clears buffers first.

'IROFF' turns off any current IR for device.

'XCHM-<extended channel mode(0-3)>' Change the output pattern for the XCH send command.
Mode 0: [x][x]<x><enter>
Example: 'XCH 3' The resulting IR would be 3-enter.
Example: 'XCH 34' The resulting IR would be 3-4-enter.
Example: 'XCH 343' The resulting IR would be 3-4-3-enter.

Mode 1: <x><x><x><enter>
Example: 'XCH 3' The resulting IR would be 0-0-3-enter.
Example: 'XCH 34' The resulting IR would be 0-3-4-enter.
Example: 'XCH 343' The resulting IR would be 3-4-3-enter.

Mode 2: <x><x><x>
Example: 'XCH 3' The resulting IR would be 0-0-3.
Example: 'XCH 34' The resulting IR would be 0-3-4.
Example: 'XCH 343' The resulting IR would be 3-4-3.

Mode 3: [[100][100]....]<x><x>
Example: 'XCH 3' The resulting IR would be 0-3.
Example: 'XCH 34' The resulting IR would be 0-3-4.
Example: 'XCH 343' The resulting IR would be 100-100-100-4-3.

Mode 4: Sends same sequences as the 'CH' command. Only use for channels 0-199. (v3.731)

'XCH<Channel 0-999>' Produdes the IR according to the pattern set by the XCHM send command.

Carrier Commands:
'CARON' - Carrier will respond according to the front panel DIP switch setting.
'CAROFF' - Carrier is turned off until a 'CARON' command is received.

---

20 AXCENT3/AXCENT3 PRO Integrated AXCESS System

20.1 CHANNELS

CHANNEL **FUNCTION**

RS232/422/485 devices:

255	CTS push channel.
255	Reflects the state of the CTS input if a 'CTSPSH' command was sent to the device.

IR devices: 1-253 IR commands.

254	Power Fail. (Used with 'PON' and 'POF' commands.)
255	Power status.(Shadowed with I/O Link channel status.)

IO device:

1-6	I/O channel.

20.2 COMMANDS

(SEND_COMMAND 0,"command")

```
'CLOCK mm-dd-yy hh:mm:ss' sets the time and date.

   Example:
   'CLOCK 01-08-93 19:16:00' sets the time to 7:16 PM and date
       to January 8, 1993



"'RDS',dev,string" re-directs a string to the device specified in dev.
"'RDC',dev,command" re-directs a command to the device specified in dev.

   Examples:
   SEND_COMMAND 0,"'RDS',200,'HELLO'"
     same as SEND_STRING 200,'HELLO' in axcess.
   SEND_COMMAND 0,"'RDC',200,'PAGE-MAIN PAGE'"
     same as SEND_COMMAND 200,'PAGE-MAIN PAGE' in axcess.

'SET BAUD' Send_Command to device 0 to allow override
    of AutoBaud. Valid parameters are:

    300,600,1200,2400,4800,9600,19200,38400,115k, or AUTO.

  This is cleared on power down. AutoBaud is restored on
  power up.  On all masters but SmartPack and Axcent3,
  will override dip switch until dip switch is changed.

  Typical Examples: (typed in Terminal Emulator)

  SEND_COMMAND 0,'SET BAUD 9600'
          forces master port baud to 9600.

  SEND_COMMAND 0,'SET BAUD 115k'
          forces master port baud to 115.2k.
          (Axcent3 only.)

  SEND_COMMAND 0,'SET BAUD AUTO'
```

forces master port baud to AutoBaud.

'SHOW XXX' Sends SHOW DEVICE strings to requesting device starting at device XXX.

Note: If a Send_Command to the master starts with an ESC, the second byte is used as the requesting device instead of the device that sent the command. The command is then assumed to begin with the third byte.

RS232/422/485 devices:

'RXON' enables card to send incoming received characters to Master. This command is automatically sent by Master when a 'CREATE_BUFFER' program instruction is executed
'RXOFF' (default) card will not pass on received characters to Master
'RXCLR' any characters waiting in the receive buffer waiting to be sent to Master will be cleared
'TXCLR' any characters waiting in the transmit out buffer will be cleared and transmission will stop
'B9MON' enables a special 9 data bits with 1 stop bit mode which overrides the DIP switch settings for number of data, stop, and parity bits. The baud rate is locked on at the current DIP switch setting on issuance of this command
'B9MOFF' (default) sets data bits mode to normal with DIP switch setting
'HSOFF' (default) hardware handshaking disabled.
'HSON' enable hardware handshaking
'XOFF' (default) software handshaking disabled
'XON' enable software handshaking
'CHARD-<time in 100 microsecond increments 0-255>' sets delay between all transmitted characters to that specified

Example of usage:
'CHARD-10' sets 1mS delay between all transmitted characters
'CHARDM<time in 1 millisecond increments 0-255>' sets delay between all transmitted characters to that specified

Example of usage:
'CHARDM10' sets 10mS delay between all transmitted characters
'CTSPSH' enables PUSHes and RELEASEs and status on Device 4 channel 255 for CTS hardware handshake input. If CTS is high, then channel is on.

SEND_STRINGs:

This card also has some special SEND_STRING escape sequences:

If any of the 3 character combinations below are found anywhere within a SEND_STRING program instruction, they will be treated as a command and not the literal characters:

* "27,17,<time in 100 microsecond increments 1-255>" sends a break character of the specified length of time
* "27,18,1" sets the 9th data bit to 1 for all subsequent characters to be transmitted. Used in conjunction with the 'B9MON' command

```
   * "27,18,0" clears the 9th data bit to 0 for all subsequent characters
       to be transmitted.  Used in conjunction with the 'B9MON' command
   * "27,19,<time in 1 millisecond increments 1-255>" inserts a
       delay before the next character to be transmitted
   * "27,20,0" un-asserts RTS hardware handshake output high
   * "27,20,1" asserts RTS hardware handshake output low

IR/Serial devices:


"'CH',<channel>" sends IR pulses to select channel.
     All channel below 100 are two digits.
     If the IR code for ENTER (#21) is loaded a enter will follow
     the number.
     If the channel is >= 100 then IR fn 127 is generated for the one
     hundred digit.
"'CTON',<time>" sets 'CH' pulse on time in tenths of second.
"'CTOF',<time>" sets 'CH' pulse off time in tenths of second.
    Default time is .5 seconds.
    Time is store in NV Ram.

"'SP',<code>" send single IR pulse.
    Uses CTON and CTOF times for pulse times.

"'CP',<code>" same as 'SP' but clears buffers first.

'IROFF' turns off any current IR for device.

'XCHM-<extended channel mode(0-3)>' Change the output pattern for the
   XCH send command.
   Mode 0:  [x][x]<x><enter>
   Example:  'XCH 3'    The resulting IR would be 3-enter.
   Example:  'XCH 34'   The resulting IR would be 3-4-enter.
   Example:  'XCH 343'  The resulting IR would be 3-4-3-enter.

   Mode 1:  <x><x><x><enter>
   Example:  'XCH 3'    The resulting IR would be 0-0-3-enter.
   Example:  'XCH 34'   The resulting IR would be 0-3-4-enter.
   Example:  'XCH 343'  The resulting IR would be 3-4-3-enter.

   Mode 2:  <x><x><x>
   Example:  'XCH 3'    The resulting IR would be 0-0-3.
   Example:  'XCH 34'   The resulting IR would be 0-3-4.
   Example:  'XCH 343'  The resulting IR would be 3-4-3.

   Mode 3:  [[100][100]....]<x><x>
   Example:  'XCH 3'    The resulting IR would be 0-3.
   Example:  'XCH 34'   The resulting IR would be 0-3-4.
   Example:  'XCH 343'  The resulting IR would be 100-100-100-4-3.

   Mode 4:  Sends same sequences as the 'CH' command. Only use for
             channels 0-199.                          (v3.731)

'XCH<Channel 0-999>' Produdes the IR according to the pattern set by
   the XCHM send command.

Carrier Commands:
```

'CARON' - Carrier will respond according to the
front panel DIP switch setting.
'CAROFF' - Carrier is turned off until a 'CARON' command is received.

Power Control Commands:

"'DE',<time in tenth seconds>" sets the delay time that the TV power sensor must be stable before being considered changed. Default is 1 second.
'PON' turns on device based on I/O Link input. If I/O reads that device is off then IR function 27 is generated in attempt to turn device on. If 3 attempts fail, unit will continue executing commands in the buffer. If no commands are in the buffer, unit will continue to try until a 'POF' or 'POD' command is received. If unit fails to turn device on, a PUSH and RELEASE on channel 254 is made to indicate a power failure error. If at any time the I/O reads that the device is off (such as if one went to the front panel and turned it off), the unit will automatically attempt to turn device back on. Channel 255 changes are disabled after receipt of this command.
'POF' turns off device based on I/O Link input. If sensor reads that device is on then IR function 28 is generated in attempt to turn device off. If 3 attempts fail, unit will continue executing commands in the buffer. If no commands are in the buffer, unit will continue to try until a 'PON' or 'POD' command is received. If unit fails to turn device off, a PUSH and RELEASE on channel 254 is made to indicate a power failure error. If at any time the I/O reads that the device is on (such as if one went to the front panel and turned it on), the unit will automatically attempt to turn device back off. Channel 255 changes are disabled after receipt of this command.
'POD' disables previous 'PON' or 'POF' commands for forcing device power. Channel 255 changes are enabled.
"'PTON',<time in tenth seconds>" sets the IR Power on pulse time. Default time is 5 (.5 second). Time is stored in permanent memory until changed.
"'PTOF',<time in tenth seconds>" sets the amount of off time after an IR Power on pulse before new IR pulses can be generated (gives TV time to power up and get ready). Default time is 15 (1.5 seconds). Time is stored in permanent memory.

****

Configuration Commands:

All devices:

SET BASE DEVICE NUMBER
Master to Slave - From Terminal
SET BASE DEVICE NUMBER <starting device number>
Slave to Master - From Terminal
SET BASE DEVICE NUMBER 1

LED-DIS
(Modified 1999-04-27)
Disables the LED (on 32 LED hardware) for a device. Regardless of whether or not the device is active, the LED will not be lit.

Example:

SEND_COMMAND RELAYS, 'LED-DIS'

Disables the LEDs for all the relays.

LED-EN

Default. Enables the LED (on 32 LED hardware) for a device. When the device is active, the LED is lit. When the device is not active, the LED is not lit.

Example:

SEND_COMMAND RS232_3,'LED-EN'

Enables both the transmit and receive LED for the third serial port.

RS232/422/485:

SET BAUD baud,parity,data,stop [485 (Enable|Disable)]

Sets the communication settings for a device.

baud	parity	data	stop
115k	N	8	1
38400	O	7	2
19200	E		
9600	M		
4800	S		
2400			
1200			
600			
300			

Examples:

SEND_COMMAND RS232_1,'SET BAUD 9600,N,8,1 485 DISABLE'
SEND_COMMAND RS232_4,'SET BAUD 115k,N,8,1 485 ENABLE'

GET BAUD

Gets the communication settings for a device.
Device sends the response out the master program port.

Examples:

SEND_COMMAND RS232_1,'GET BAUD'

Device responds with:

DEVICE x baud,parity,data,stop 485 ENABLED [or] DISABLED

IR/Serial/RS232 Devices:

SET BAUD baud,parity,data,stop

Sets the communication settings for a device.

baud	parity	data	stop
38400	N	8	1
19200	O	7	
9600	E		
4800			
2400			
1200			
600			
300			

Examples:

```
SEND_COMMAND RS232_1,'SET BAUD 9600,N,8,1'
SEND_COMMAND RS232_4,'SET BAUD 19200,N,8,1'
```

GET BAUD

Gets the communication settings for a device.
Device sends the response out the master program port.

Examples:

```
SEND_COMMAND IR_1,'GET BAUD'
```

Device responds with:

DEVICE x baud,parity,data,stop

SET IO LINK

Sets an IR device to link to an I/O channel for use with 'PON' and 'POF' commands. The I/O channel is used for power sensing (via a PCS). A channel of zero disables the link.

Examples:

```
SEND_COMMAND IR_1,'SET IO LINK 1'
```

```
                SEND_COMMAND IR_1,'SET IO LINK 0'


        SET MODE

                Sets the port to IR, Serial, or DATA mode.

                Examples:

                SEND_COMMAND IR_1,'SET MODE IR'
                SEND_COMMAND IR_1,'SET MODE SERIAL'
                SEND_COMMAND IR_1,'SET MODE DATA'

        GET MODE

                Gets the port to IR, Serial, or DATA mode and other info

                Examples:

                SEND_COMMAND IR_1,'GET MODE'

                Device responds with.

                DEVICE x mode,carrier,io link channel



I/O Devices:
---------------


        SET INPUT

                Sets the input channel active state.  Active state can be
                high (logic high) or low (logic low or contact closure).
                Channel changes and Pushes/Releases are reported based on
                the active state.

                Example:

                SEND_COMMAND IO,'SET INPUT 1 HIGH'
                SEND_COMMAND IO,'SET INPUT 6 LOW'

        GET INPUT

                Gets the input channel active state.

                Example:

                SEND_COMMAND IO,'GET INPUT 1'

                Device responds with.

                INPUT x ACTIVE active state.

Terminal Commands:
```

```
 ---------------
        LEDON

                Note that this is a Program Port Commmand and not a Send
Command.
                For AXcent 3's with 32 LEDs, will light all LEDs for
approximately
                2 seconds.  This command is used for hardware test purposes.

**************************************
Added 1999-04-27 for v5.000
XMODEM TIMING COMMANDS

        XMODEM TIMEOUTS (default is 10sec):
        1. Via the Program Port: 'TIMEOUT XX'
        2. Over AXlink:          SEND_COMMAND 0,'TIMEOUT XX'
        3. Over AXlink:          SEND_COMMAND 1,'TIMEOUT XX'
        Where XX is from 1 to 50 seconds in 1-second increments.
        Note that any of the above will change timing
        for AXcess code download as well as Softrom transfer.

        XMODEM RETRIES (default is 5):
        1. Via the Program Port: 'RETRY XX'
        2. Over AXlink:          SEND_COMMAND 0,'RETRY XX'
        3. Over AXlink:          SEND_COMMAND 1,'RETRY XX'
        Where XX is from 1 to 10 in increments of 1.
        Note that any of the above will change number or retries
        for AXcess code download as well as Softrom transfer.

**************************************

--------------------------------------------------------------------------------
```

21 AXC-232 RS232/422/485 Card

21.1 CHANNELS

CHANNEL	FUNCTION
255	Reflects the state of the CTS input if a 'CTSPSH' command was sent to the AXB-232+.

21.2 COMMANDS

(SEND_COMMAND DEV,"command")

```
'RXON' enables card to send incoming received characters to Master.
   This command is automatically sent by Master when a
   'CREATE_BUFFER' program instruction is executed
'RXOFF' (default) card will not pass on received characters to
   Master
'RXCLR' any characters waiting in the receive buffer waiting to be
   sent to Master will be cleared
'TXCLR' any characters waiting in the transmit out buffer will
   be cleared and transmission will stop
'B9MON' enables a special 9 data bits with 1 stop bit mode which
   overrides the DIP switch settings for number of data, stop, and
   parity bits.  The baud rate is locked on at the current DIP switch
   setting on issuance of this command
'B9MOFF' (default) sets data bits mode to normal with DIP switch
   setting
'HSOFF' (default) hardware handshaking disabled  (added V1.16)
'HSON' enable hardware handshaking  (added V1.16)
'XOFF' (default) software handshaking disabled  (added V1.18)
'XON' enable software handshaking  (added V1.18)
'EON'  intended for RS-485 mode, with this command, characters
   received from the transmitter (because TX & RX are tied together)
   will be ignored.  (added V1.27)
'EOFF' (default) disables 'EON' command above. (added V1.27)
'CTSPSH' enables PUSHes and RELEASEs and status on channel 255
   for CTS hardware handshake input.  If CTS is high, then channel
   is on.  (added V1.24)
'CTSPSHF' disables PUSHes and RELEASEs and status on channel 255
   for CTS hardware handshake input.  See CTSPSH above.  (added V1.33)

'CHARD-<time in 100 microsecond increments 0-255>' sets delay between
   all transmitted characters to that specified

   Example of usage:
     'CHARD-10' sets 1mS delay between all transmitted characters

'TXEND-<time in 100 microsecond increments 0-255>' This command is
   used when in 485 mode, it will insert a delay between transmit
   enable and the first character being transmitted in each packet.
   (Added V1.28 AXC-232 -- NOT available on AXB-232+)

   Example of usage:
     'TXEND-20' sets 2mS delay between transmit enable and the
                first character to be transmitted.

SEND_STRINGs:
```

This card also has some special SEND_STRING escape sequences:

If any of the 3 character combinations below are found anywhere within a SEND_STRING program instruction, they will be treated as a command and not the literal characters:

* "27,17,<time in 100 microsecond increments 1-255>" sends a break character of the specified length of time

  Note that in 485 mode break is ignored.

* "27,18,1" sets the 9th data bit to 1 for all subsequent characters to be transmitted. Used in conjunction with the 'B9MON' command
* "27,18,0" clears the 9th data bit to 0 for all subsequent characters to be transmitted. Used in conjunction with the 'B9MON' command
* "27,19,<time in 1 millisecond increments 1-255>" inserts a delay before the next character to be transmitted (V1.16)

  Note that in 485 mode, if the delay escape code characters are the last in the Tx buffer, the 485 Tx output will tri-state at the beginning of the delay.

* "27,20,0" un-asserts RTS hardware handshake output high (V1.20)
* "27,20,1" asserts RTS hardware handshake output low (V1.20)

** NOTE ** If it is necessary to send a string containing the sequences "27,17", "27,18", "27,19" or "27,20", use two SEND_STRING instructions; the first containing characters up to and including "27", the second beginning with "17", "18", "19", or "20" and all subsequent characters, i.e., to send the string "$1B,'C',0,27,17,13", use:

```
{
  SEND_STRING <dev>,"$1B,'C',0,27"
  SEND_STRING <dev>,"17,13"
}
```

---

22 AXC-232++ Smart RS-232 Interface Card

22.1 CHANNELS

CHANNEL	FUNCTION
254	This is only valid within the device and is not sent to the AXLink master. It indicates the status of AXLink. This channel is ON if AXLink is active otherwise the channel is OFF.
255	Reflects the state of the CTS input if a 'CTSPSH' command was sent to the AXC-232++.

22.2 COMMANDS

(SEND_COMMAND DEV,"command")

```
'B9MON' enables a special 9 data bits with 1 stop bit mode which
   overrides the DIP switch settings for number of data, stop,
   and parity bits.  The baud rate is locked on at the current
   DIP switch setting on issuance of this command
'B9MOFF' (default) sets data bits mode to normal with DIP switch
   setting
'BAUDHIGH' enables 115.2k baud rate when the dip switch is set to 300
   baud settings. (added v2.13)
'BAUDMED' enables 57.6k baud rate when the dip switch is set to 300
   baud settings. (added v3.02)
'BAUDLOW' (default) sets the baud rate to 300 baud when the dip switch
   is set to 300 baud settings. (added v2.13)
'CB1ON' (default) Enable placement of characters in the buffer
   specified in the CREATE_BUFFER 1,buffer statement.
'CB1OFF' Disable placement of characters in the buffer specified
   in the CREATE_BUFFER 1,buffer statement.
'CHARD-<time in 100 microsecond increments 0-255>' sets delay
   between all transmitted characters to that specified.

      Example of usage:
        'CHARD-10' sets 1mS delay between all transmitted characters

'CTSPSH' enables PUSHes and RELEASEs and status on channel 255
   ([0,255] within the AXC-232++) for CTS hardware handshake
   input.  If CTS is high, then channel is on.
'CTSPSHF' disables CTSPSH (See above).  (added V3.04)
'EOFF' (default) disable 'EON' command above.
'EON' This command will cause the card to ignore transmitted
   characters on its receiver.  When using RS485, the
   transmitter and receiver are tied together-this command
   forces the card to ignore the characters being received from
   the transmitter.
'HSOFF' (default) hardware handshaking disabled.
'HSON' enable hardware handshaking.
'RXOFF' (default) AXC-232++ will not pass on received characters
   to Master
'RXON' enables AXC-232++ to send incoming received characters to
   Master.  This command is automatically sent by Master when a
   'CREATE_BUFFER' program instruction is executed
'RXCLR' any characters waiting in the receive buffer waiting to
   be sent to Master will be cleared
```

'TXCLR' any characters waiting in the transmit out buffer will
be cleared and transmission will stop
'XOFF' (default) software handshaking disabled.
'XON' enable software handshaking.
'ZAP!' Clears AXCESS program in AXC-232++.

****
Added 1999-05-14 for v5.000
XMODEM TIMING COMMANDS

XMODEM TIMEOUTS (default is 10sec):
1. Via the Program Port: 'TIMEOUT XX'
2. Over AXlink: SEND_COMMAND SERIAL,'TIMEOUT XX'
Where XX is from 1 to 50 seconds in 1-second increments.
Note that any of the above will change timing
for AXcess code download as well as Softrom transfer.

XMODEM RETRIES (default is 5):
1. Via the Program Port: 'RETRY XX'
2. Over AXlink: SEND_COMMAND SERIAL,'RETRY XX'
Where XX is from 1 to 10 in increments of 1.
Note that any of the above will change number or retries
for AXcess code download as well as Softrom transfer.

SEND_STRINGs:

This devices also has some special SEND_STRING escape sequences:

If any of the 3 character combinations below are found anywhere within
a SEND_STRING program instruction, they will be treated as a command
and not the literal characters:

* "27,17,<time in 100 microsecond increments 1-255>" sends a
break character of the specified length of time
* "27,18,1" sets the 9th data bit to 1 for all subsequent characters
to be transmitted. Used in conjunction with the 'B9MON' command
* "27,18,0" clears the 9th data bit to 0 for all subsequent characters
to be transmitted. Used in conjunction with the 'B9MON' command
* "27,19,<time in 1 millisecond increments 1-255>" inserts a
delay before the next character to be transmitted
* "27,20,0" un-asserts RTS hardware handshake output high
* "27,20,1" asserts RTS hardware handshake output low

---

23 AXC-366 RS-366 Interface Card

23.1 CHANNELS

CHANNEL **FUNCTION**

200 Distant station connected (DSC); call connected
201 Data line occupied (DLO); dialer in use
202 Abort call and retry (ACR); line was busy or a timeout occured
203 Power indicator (PWI); dialer has power

Note: The proper sequence for dialing is to send the 'DIAL' command, wait for a PUSH on channel 200 or 202, and respond appropriately. Channels can be used for PUSH and RELEASE or status feedback

23.2 COMMANDS

(SEND_COMMAND DEV,"command")

```
'DIAL-nnnnnnnnnn' dials the number specified where each n
   consists of a digit 0 to 9,'*','#','E', or an 'S'
   'E' = EON:End of number, required after telephone number
   'S' = SEP:Separator, use unknown
'CANCEL' cancels a dial operation in progress
'IDLO'   Cause the DLO input to be ignored.            (v1.01)
'ODLO'   Cause the DLO input to be observed. (default)  (v1.01)

The proper sequence for dialing is to send the 'DIAL' command,
wait for a PUSH on channel 200 or 202, and respond appropriately
```

---

24 AXC-DMX8 DMX Control Card

24.1 CHANNELS

CHANNEL	FUNCTION
1	while channel is on, ramps level 1 up at current speed
2	while channel is on, ramps level 1 down at current speed
3	while channel is on, ramps level 2 up at current speed
4	while channel is on, ramps level 2 down at current speed
5	while channel is on, ramps level 3 up at current speed
6	while channel is on, ramps level 3 down at current speed
7	while channel is on, ramps level 4 up at current speed
8	while channel is on, ramps level 4 down at current speed
9	while channel is on, ramps level 5 up at current speed
10	while channel is on, ramps level 5 down at current speed
11	while channel is on, ramps level 6 up at current speed
12	while channel is on, ramps level 6 down at current speed
13	while channel is on, ramps level 7 up at current speed
14	while channel is on, ramps level 7 down at current speed
15	while channel is on, ramps level 8 up at current speed
16	while channel is on, ramps level 8 down at current speed

Note: For setting ramp speed and presets, see SEND_COMMAND programming instruction for this card. For reading current DMX levels and displaying bargraphs see CREATE_LEVEL and SEND_LEVEL programming instructions. DMX output levels 1 to 8 use levels 1 to 8 respectively.

24.2 COMMANDS

(SEND_COMMAND DEV,"command")

```
'P<output channel 1-8>L<level 0-255|0-100%>[T<time 0-255 in tenth
   seconds]'

     Level 0 is the lowest voltage and 255 or 100% is the highest
     voltage

     Ramps specified channel from current level to a specified
     preset level or percentage at the current rate or optionally
     in a specified amount of time

   Example of usage:
     'P3L50%' ramps channel 3 to 50% mid voltage level at the current
        ramp rate
     'P4L255T30' ramps channel 4 to highest voltage level in 3 secs

'P<output channel 1-8>R<time 0-255 in tenth seconds>[U|D]'
   Sets the ramp rate of the specified channel where the time is
   the time to ramp the full range both down to up and up to down or
   optionally just down to up or just up to down
   Example of usage:
     'P1R50' sets ramp rate of channel 1 to 5 seconds full range
        from down to up and up to down
     'P2R75U' sets ramp rate of channel 2 to 7.5 seconds full range
        from down to up only
```

25 AXC-DTMF DTMF Card

25.1 CHANNELS

CHANNEL **FUNCTION**

1-16 while channel is on, generates DTMF tones
1-9 are tones handset digits 1-9
10 is handset digit 0
11 is handset *
12 is handset #
13-16 are handset A-D these are only availible on special handsets

17-32 these channels are on while receiving DTMF tones

34 this channel turns on when busy is detected

35 this channel turns on when a ring tone is present while placing a call to external location.

36 this channel turns on when an incomming call ring is detected. each ring produces a push and release

37 while this channel is on the DTMF card is "off hook" while this channel is off the DTMF card is "on hook"

25.2 COMMANDS

(SEND_COMMAND DEV,"command")

```
'ON HOOK'     places DTMF card "on hook"

'OFF HOOK'    places DTMF card "off hook"

'AUDIO ON'    enables audio to pass from audio in
              to phone line

'AUDIO OFF'   disables audio from passing through DTMF
              card to phone line

'AUTO ON'     enables auto answer mode

'AUTO OFF'    disables auto answer mode

'PAUSE XX'    sets the pause time for the (,) comma
              the times are in 100ms increments (0-25.5sec)
              the default time is 2 seconds

    Example:      SEND_COMAND 'PAUSE 50'
                  sets the pause time to 5 secomds

'COUNT'       sets the auto answer ring count
              default count is 1

    Example:      SEND_COMMAND 'COUNT 10'
```

```
                    when auto answer is on the DTMF card answers
                    on the 10'th ring

        'TONE TIME X' sets the length of each tone and and length
                      between tones.  default time is 100ms
                      times are in 1ms increments    (50-255 ms)

            Example:      SEND_COMMAND 'TONE TIME 10'
                          sets length of tone to 50 ms because min is 50
                          SEND_COMMAND 'TONE TIME 200'
                          sets length of tone to 200

        'DIAL X-XXX-XXXX' takes line "off hook" and dials the number
                          (,) waits for a length of time set by pause time
                          (W) wait for dial tone

            Example:      'DIAL 9W 1-214-644-3048'
                          dials 9 waits for dial tone and calls AMX
                          'DIAL 9W 844-4444,1,2'
                          dials 9 waits for dial tone calls 844-4444
                          waits for pause time sends 1 pause 2
```

---

26 AXC-DTMF+ AMX telephone interface card

26.1 CHANNELS

CHANNEL **FUNCTION**

Channels sent from the DTMF card to the master
****

Channel #		DTMF Key
Channel 17	=	1
Channel 18	=	2
Channel 19	=	3
Channel 20	=	4
Channel 21	=	5
Channel 22	=	6
Channel 23	=	7
Channel 24	=	8
Channel 25	=	9
Channel 26	=	0
Channel 27	=	*
Channel 28	=	#
Channel 29	=	A
Channel 30	=	B
Channel 31	=	C
Channel 32	=	D

34
Detects an outgoing busy signal.
Call Progress Reporting returned to the AXCESS AXC-EM
Master Card when a busy signal is detected.

35
Detects an outgoing ring signal.
Call Progress Reporting returned to the AXCESS AXC-EM
Master Card when a ring signal is detected.

36
Detects an incoming ring signal (each burst indicated).

37
Detects the AXC-DTMF+ card is off hook.

38
Detects the extension phone is off hook.

39
Detects a momentary loss of loop current (call termination).

----------NOTE----------
Detection of call termination (other end hung up) is usually provided by the telephone company and is activated by a momentary loss of loop current. However, if this is not available, the DTMF+ is triggered by the receiver off hook tone which occurs approximately 1 minute after call termination.

40
Detects the receiver off hook tone.
Call Progress Reporting returned to the AXCESS AXC-EM
Master Card when a receiver off hook is detected.

------------------------------NOTE--
The AXC-DTMF+ card provides report capability for the type
of ring received. Distinctive ringing is a service which must
be obtained from the telephone company. This service allows
the same telephone line to be reached by dialing different
telephone numbers. The receiving telephone then rings in a
distinctive manner according to the number dialed. The AXC-DTMF+
card provides 4 distinctive ring type patterns. These default patterns
can be changed and the defaults are as follows:

Note that the type of ring is only reported once following the first ring.
The first ring is also reported by channel 36 as are subsequent rings.

41
Default Pattern 1
The first ring lasts 2 seconds followed by 4 seconds of
silence.

42
Default Pattern 2
There are 2 long rings in a 2 second period followed by 4
seconds of silence.

43
Default Pattern 3
There are 2 short then 1 long ring in a 2 second period
followed by 4 seconds of silence.

44
Default Pattern 4
There is 1 short, 1 long, and 1 short ring within a 2 second
period followed by 4 seconds of silence.

45 (v2.10)
Detects time out while waiting for the dial tone during a wait ('W')
in the Dial Send_Command.

47
Detects the dial tone.

Channels sent from the DTMF card to the master
****

------------------------------NOTE--
In addition to the Send_Command DIAL command, tones are also generated
directly by activating the device channel corresponding to the tone. A
tone is played as long as a channel is on. Only one tone may be active at a
time. If a second channel is activated while another is on, this causes

```
  the first tone to stop and the second tone to play.
-------------------------------------------------------------------------

  The following channels generate DTMF code:

  Channel 1  =   1
  Channel 2  =   2
  Channel 3  =   3
  Channel 4  =   4
  Channel 5  =   5
  Channel 6  =   6
  Channel 7  =   7
  Channel 8  =   8
  Channel 9  =   9
  Channel 10  =  0
  Channel 11  =  *
  Channel 12  =  #
  Channel 13  =  A
  Channel 14  =  B
  Channel 15  =  C
  Channel 16  =  D
```

26.2 COMMANDS

(SEND_COMMAND DEV,"command")

```
--------------------------NOTE-----------------------------------------
    Valid values for XXX are 0-255 for all AXC-DTMF+ card Send_Commands.
    ---------------------------------------------------------------------

++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
+     THE FOLOWING ARE THE "OPERATIVE" OR NORMALLY USED COMMANDS
++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++

    'AGAIN-OFF'
        Controls the gain of the audio (voice) signal from the phone lines
        to the audio output of the DTMF+ interface card. Setting the gain
        to "off" causes it to return to the default level.
        Default at reset = YES
        Example:
        SEND_COMMAND DTMF, 'AGAIN-OFF'
        Sets the audio gain to low from the DTMF+ interface card to default
        (no amplification boost)

     'AGAIN-ON'
        Controls the gain of the audio (voice) signal from the phone lines
        to the audio output of the DTMF+ interface card. Setting the gain to
        "on" increases the gain above the default level.
        Default at reset = NO
        Example:
        SEND_COMMAND DTMF, 'AGAIN-ON'
        Sets the audio gain from the DTMF+ interface card to high
        (amplification boost)

    'AUDIO-OFF'
```

```
    Disable the audio to pass from the "audio in" line to the phone line via
    DTMF+ interface card (modified 971217)
    Default at reset = YES
    Example:
    SEND_COMMAND DTMF,'AUDIO OFF'
    Disables the audio from passing through the DTMF+ interface
    card to the phone l

'AUDIO-ON'
    Enable the audio to pass from the "audio in" line to the phone line via
    DTMF+ interface card (modified 971217)
    Default at reset = NO
    Example:
    SEND_COMMAND DTMF,'AUDIO ON'
    Enables the audio to pass from the "audio in " phone line to
    the DTMF+ interface card

'AUDOUT-OFF'                                                  (v2.10 REV B)
    Disable the audio from passing from the phone line to the audio out
    output of the DTMF+ card
    Default at reset = NO (modified 971217)
    Example:
    SEND_COMMAND DTMF, 'AUDOUT-OFF'
    Disables the audio from passing from the phone line to the audio out
    output of the DTMF+ card

'AUDOUT-ON'                                                   (v2.10 REV B)
    Enable the audio from passing from the phone line to the audio out
    output of the DTMF+ card
    Default at reset = YES (modified 971217)
    Example:
    SEND_COMMAND DTMF, 'AUDOUT-ON'
    Enables the audio from passing from the phone line to the audio out
    output of the DTMF+ card

'AUTO-ON'
    Enable the auto answer mode
    Default at reset = NO
    Example:
    SEND_COMMAND DTMF,'AUTO ON'
    Enables the auto answer mode

-------------------------NOTE-----------------------------------------
Software Send_Commands override the auto-answer jumper settings.
----------------------------------------------------------------------

'AUTO OFF'
    Disable the auto answer mode
    Default at reset = YES
    Example:
    SEND_COMMAND DTMF,'AUTO OFF'
    Disables the auto answer mode

'COUNT-XXX'
    Set the auto answer ring count
    Default at reset = 1
    Example:
```

```
        SEND_COMMAND DTMF,'COUNT-4'
        Sets ring count to 4 before the line is answered in auto answer mode

     'DIAL-X-XXX-XXXX'
        Dial the number and send DTMF
        1.   Spaces or hyphens are ignored by the card when dialing
        2.   A 'W' in the dial command will cause the card to wait for dial tone
             before dialing the next digit in the dial command. The wait will
             time out after 2 seconds. If a time out occurs, the card will
indicate
             this by sending a push and release on channel 45.
        3.   A ',' in the Dial command will cause the card to pause for a time
             specified in the Pause Send_Command before dialing the next digit
             in the command.
        Example:
        SEND_COMMAND DTMF, 'DIAL-9 W 214,644-3048'
        Causes the card to dial a 9 and then waits for dial tone before
continuing
        to dial the next three digits. The card pauses for the time specified in
        the Pause Send_Command before dialing the remaining six digits.
        Up to 24 characters following Dial are allowed. Characters which
generate
        tones are '0 ' - '9 ','* ','# ', 'A ' - 'D '.


    --------------------------NOTE-----------------------------------------
    Tone length is set by the Tone Time Send_Command
    which sets the length of each generated tone and the time
    between tones. A additional pause can be added after a tone
    by using the Pause Send_Command.
    -------------------------------------------------------------------------

     'EXTEN-OFF'                                                (v2.10 REV B)
        Disable any phones which are hanging off the extension phone connection
        on the DTMF+ card by opening the phone circuit
        Default at reset = NO
        Example:
        SEND_COMMAND DTMF, 'EXTEN-OFF'
        Disables any phones which are hanging off the extension phone connection
        on the DTMF+ card by opening the phone circuit

     'EXTEN-ON'                                                 (v2.10 REV B)
        Enable any phones which are hanging off the extension phone connection
        on the DTMF+ card by closing the phone circuit
        Default at reset = YES
        Example:
        SEND_COMMAND DTMF, 'EXTEN-ON'
        Enables any phones which are hanging off the extension phone connection
        on the DTMF+ card by closing the phone circuit

     'FLASH'                                                    (v2.10)
        Cause a flash-hook for a period of time set by the Send_Command FLASH
TIME
        Example:
        SEND_COMMAND DTMF, 'FLASH'
        Causes a flash-hook for a period of time set by the Send_Command FLASH
TIME
```

```
    'OFF HOOK'
        Place the DTMF+ interface card "off hook "
        Default at reset = NO
        Example:
        SEND_COMMAND DTMF,'OFF HOOK'
        Places the DTMF+ interface card "off hook "

    'ON HOOK'
        Place the DTMF interface card "on hook "
        Default at reset = YES
        Example:
        SEND_COMMAND DTMF,'ON HOOK'
        Places the DTMF interface card "on hook "

++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
+     THE FOLOWING ARE THE SIGNAL TIMING (COMMANDS NOT NORMALLY USED)
++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++

    ------------------------WARNING:-------------------------------------
    Changing the default time values may inadvertently alter the operation of
    the AXC-DTMF+ card.  It is not necessary to change most default values.
    ---------------------------------------------------------------------

    'BLOCKRDET-XXX'
        For telephone lines with distinctive ring feature
        Time increment = 10ms
        Example:
        SEND_COMMAND DTMF,'BLOCKRDET-185'
        Sets the time to ignore "sub rings " at 1.85 sec (1850ms)

     'FLASH TIME-XXX'                                          (v2.10)
        Set the the time the DTMF+ interface card will go "on-hook" when the
        Send_Command FLASH is issued
        Time increment = 10ms
        Default at reset = 63
        Example:
        SEND_COMMAND DTMF, 'FLASH TIME-65'
        Sets the the time the DTMF+ interface card will go "on-hook" when the
        Send_Command FLASH is issued for .65 sec (650ms)

    'INROFFMIN-XXX'
        Minimum time required for an incoming ring to be in the off
        state to reset ring count on DTMF+ interface card
        Time increment = 100ms
        Default at reset = 45
        Example:
        SEND_COMMAND DTMF,'INROFFMIN-55'
        Sets the minimum off state time for an incoming ring to 5.5 sec
        (5500ms)

    'LOSSLCMAX-XXX'
        The maximum time a loop current is off (used to detect other
        end hung up)
        Time increment = 10ms
        Default at reset = 80
        Example:
```

```
    SEND_COMMAND DTMF,'LOSSLCMAX-90'
    Sets a .9 sec (900ms) maximum off time for a loop current

'LOSSLCMIN-XXX'
    The minimum time a loop current is off (used to detect other
    end hung up)
    Time increment = 10ms
    Default at reset = 10
    Example:
    SEND_COMMAND DTMF,'LOSSLCMIN-15'
    Sets a .15 sec (150ms) minimum off time for a loop current

'OBUOFFMAX-XXX'
    Outgoing busy off time maximum
    Time increment = 10ms
    Default at reset = 60
    Example:
    SEND_COMMAND DTMF,'OBUOFFMAX-65'
    Sets the outgoing busy off time maximum to .65 sec (650ms)

-------------------------NOTE-----------------------------------------
In order for the code to work properly, ring, busy, and
reorder time values are set where ring is greater than
busy, and busy greater than reorder (ring>busy>reorder).
----------------------------------------------------------------------

'OBUOFFMIN-XXX'
    Outgoing busy off time minimum
    Time increment = 10ms
    Default at reset = 40
    Example:
    SEND_COMMAND DTMF,'OBUOFFMIN-45'
    Sets the outgoing busy off time minimum to .45 sec (450ms)
    (see NOTE for Send_Command 'OBUOFFMAX-XXX')

'OBUONMAX-XXX'
    Outgoing busy on time maximum
    Time increment = 10ms
    Default at reset = 60
    Example:
    SEND_COMMAND DTMF,'OBUONMAX-65'
    Sets the outgoing busy on time maximum to .65 sec (650ms)
    (see NOTE for Send_Command 'OBUOFFMAX-XXX')

'OBUONMIN-XXX'
    Outgoing busy on time minimum
    Time increment = 10ms
    Default at reset = 40
    Example:
    SEND_COMMAND DTMF,'OBUONMIN-50'
    Sets the outgoing busy on time minimum to .5 sec (500ms)
    (see NOTE for Send_Command 'OBUOFFMAX-XXX')


'OREOFFMAX-XXX'
    Outgoing reorder (fast busy) off time maximum
    Time increment = 10ms
```

```
    Default at reset = 35
    Example:
    SEND_COMMAND DTMF,'OREOFFMAX-45'
    Sets the outgoing reorder (fast busy) off time maximum to .45 sec
    (450ms) (see NOTE for Send_Command 'OBUOFFMAX-XXX')

'OREOFFMIN-XXX'
    Outgoing reorder (fast busy) off time minimum
    Time increment = 10ms
    Default at reset = 15
    Example:
    SEND_COMMAND DTMF,'OREOFFMIN-20'
    Sets the outgoing reorder (fast busy) off time minimum to .20 sec
    (200ms) (see NOTE for Send_Command 'OBUOFFMAX-XXX')

'OREONMAX-XXX'
    Outgoing reorder (fast busy) on time maximum
    Time increment = 10ms
    Default at reset = 35
    Example:
    SEND_COMMAND DTMF,'OREONMAX- 45'
    Sets the outgoing reorder (fast busy) on time maximum to .45 sec
    (450ms) (see NOTE for Send_Command 'OBUOFFMAX-XXX')

'OREONMIN-XXX'
    Outgoing reorder (fast busy) on time minimum
    Time increment = 10ms
    Default at reset = 15
    Example:
    SEND_COMMAND DTMF,'OREONMIN-20'
    Sets the outgoing reorder (fast busy) on time minimum to .20 sec
    (200ms) (see NOTE for Send_Command 'OBUOFFMAX-XXX')

'ORIOFFMAX-XXX'
    Outgoing ring off time maximum
    Time increment = 100ms
    Default at reset = 44
    Example:
    SEND_COMMAND DTMF,'ORIOFFMAX-50'
    Sets the outgoing ring off time maximum to 5.0 sec (5000ms)
    (see NOTE for Send_Command 'OBUOFFMAX-XXX')

'ORIOFFMIN-XXX'
    Outgoing ring off time minimum
    Time increment = 100ms
    Default at reset = 36
    Example:
    SEND_COMMAND DTMF,'ORIOFFMIN-40'
    Sets the outgoing ring off time minimum to 4.0 sec (4000ms)
    (see NOTE for Send_Command 'OBUOFFMAX-XXX')

'ORIONMAX-XXX'
    Outgoing ring on time maximum
    Time increment = 100ms
    Default at reset = 22
    Example:
    SEND_COMMAND DTMF,'ORIONMAX-30'
```

```
    Sets the outgoing ring on time maximum to 3.0 sec (30000ms)
    (see NOTE for Send_Command 'OBUOFFMAX-XXX')

'ORIONMIN-XXX'
    Outgoing ring on time minimum
    Time increment = 100ms
    Default at reset = 18
    Example:
    SEND_COMMAND DTMF,'ORIONMIN-25'
    Sets the outgoing ring on time minimum to 2.5 sec (2500ms)
    (see NOTE for Send_Command 'OBUOFFMAX-XXX')

'PAUSE-XXX'
    Set the pause time for the comma (,) symbol in the Dial
    Send_Command (refer to 'DIAL-X-XXX-XXXX')
    Time increment = 100ms
    Default at reset = 20
    Example:
    SEND_COMMAND DTMF,'PAUSE-25'
    Sets the pause time to 2.5 sec (2500ms).

'ROHOFFMAX-XXX'
    Receiver off-hook off time maximum
    THROUGH VER 1.11:
      Time increment = 1ms
      Default at reset = 100
      Example:
      SEND_COMMAND DTMF,'ROHOFFMAX-110'
      Sets the receiver off-hook off time maximum to .11 sec
      (110ms)
    VER 1.12 AND ABOVE:
      Time increment = 10ms
      Default at reset = 12


--------------------------NOTE-----------------------------------------
THROUGH VER 1.11:
Even though the receiver off-hook signal is actually
symmetrical (with respect to low and high times), the on
time gets "stretched" and cuts into the off time because of
the hardware characteristics on the board.
-----------------------------------------------------------------------

'ROHOFFMIN-XXX'
    Receiver off-hook off time minimum
    THROUGH VER 1.11:
      Time increment = 1ms
      Default at reset = 60
      Example:
      SEND_COMMAND DTMF,'ROHOFFMAX-65'
      Sets the receiver off-hook off time minimum to .065 sec (65ms)
      (see NOTE for Send_Command 'ROHOFFMAX-XXX')
    VER 1.12 AND ABOVE:
      Time increment = 10ms
      Default at reset = 8
```

```
    'ROHONMAX-XXX'
        THROUGH VER 1.11:
          Receiver off-hook on time maximum
          Time increment = 1ms
          Default at reset = 140
          Example:
          SEND_COMMAND DTMF,'ROHONMAX-145'
          Sets the receiver off-hook on time maximum to .145 sec
          (145ms) (see NOTE for Send_Command 'ROHOFFMAX-XXX')
        VER 1.12 AND ABOVE:
          Time increment = 10ms
          Default at reset = 12


    'ROHONMIN-XXX'
        THROUGH VER 1.11:
          Receiver off-hook on time minimum
          Time increment = 1ms
          Default at reset = 100
          Example:
          SEND_COMMAND DTMF,'ROHONMIN-110'
          Sets the receiver off-hook on time minimum to .11 sec (110ms)
          (see NOTE for Send_Command 'ROHOFFMAX-XXX')
        VER 1.12 AND ABOVE:
          Time increment = 10ms
          Default at reset = 8


    'TONE TIME-XXX'
        Set length of each generated tone and the time between tones
        in the Dial Send_Command (refer to 'DIAL-X-XXX-XXXX')
        Time increment = 1ms
        Default at reset = 100
        Example:
        SEND_COMMAND DTMF,'TONE TIME-110'

++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
+     THE FOLOWING ARE THE FINE TUNING COMMANDS (COMMANDS NOT NORMALLY USED)
++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++

    ------------------------WARNING:-----------------------------------
    Changing the default fine tuning values may inadvertently alter the
    operation of the AXC-DTMF+ card.  It is not necessary to change most
    default values.
    -------------------------------------------------------------------

     'CPGAIN-OFF'
        When off does not add gain (in addition to IGAIN) to the dial tone
        call progress signal
        Default at reset = YES
        Example:
        SEND_COMMAND DTMF, 'CPGAIN-OFF'
        Sets the gain into the call progress detector chip as default

     'CPGAIN-ON'
        When on adds additional gain (in addition to IGAIN) to the dial tone
        call progress signal
```

Default at reset = NO
Example:
SEND_COMMAND DTMF, 'CPGAIN-ON'
Sets the gain into the call progress detector chip as high

'IGAIN-OFF'
Controls the gain of the "internal signals" on the DTMF+ card. The internal
signals are call progress tones such as incoming DTMF, receiver off-hook,
and called number is busy. Setting the gain to "off" causes it to return to
the default level.
Default at reset = YES
Example:
SEND_COMMAND DTMF, 'IGAIN-OFF'
Sets the internal gain on the DTMF+ interface card to default

'IGAIN-ON'
Controls the gain of the "internal signals" on the DTMF+ card. The internal
signals are call progress tones such as incoming DTMF, receiver off-hook,
and called number is busy. Setting the gain to "on" increases the gain
above the default level. This may be helpful if these signals are not being
detected due to attenuation over the phone line.
Default at reset = NO
Example:
SEND_COMMAND DTMF, 'IGAIN-ON'
Sets the internal gain on the DTMF+ interface card to high

++
+ THE FOLOWING ARE THE DISTINCTIVE RING PATTERN COMMANDS
++

----------NOTE----------
Distinctive ringing is a service provided by a local telephone company which allows
telephones connected to a telephone line to ring in a unique pattern other than the normal
customary ring used for incoming calls. A distinctive ring pattern is used to identify that
an incoming call is to be answered by another individual or a device such as a fax
machine, for example.
The AXC-DTMF+ card produces four distinctive ring default patterns. Each pattern may
be programmed for a different ring pattern, if required. Default time values for each
pattern are shown in below. A pattern consists of five parts. Depending on the ring
pattern, a part is either high or low.

Default Pattern 1 1 ring lasting 2 seconds followed by 4 seconds of silence

Default Pattern 2 2 long rings, in a 2 second period, followed by 4 seconds of silence
Default Pattern 3 2 short then 1 long ring, in a 2 second period, followed by 4 seconds
of silence
Default Pattern 4 short, 1 long, and 1 short ring, within a 2 second period, followed
by 4 seconds of silence

DTMF+ distinctive ring default
patterns and time values

NOTE:
Time values are in milliseconds (1000ms equals 1 second). All 4 distinctive ring patterns are within a 2 second period from start to end time, for most applications. If you plan to change any of the distinctive ring patterns, it is advisable to stay within a 2 second time frame for each distinctive ring pattern.

Changing a Default Ring Pattern
Change a default ring pattern using the appropriate Send_Command when programming the AXC-DTMF+ card. Each pattern consists of five parts and each part has a
Send_Command.

For example, pattern 3's five parts are as follows:
- Part 1 is high and 300ms (.3 sec) long (ring).
- Part 2 is low and 200ms (.2 sec) long (no ring).
- Part 3 is high and 1000ms (1 sec) long (ring).
- Part 4 is low and 200ms (.2 sec) long (no ring).
- Part 5 is high and 800ms (.3 sec) long (ring).

If you want to change the time values of Parts 2 and 4 (no ring) to further separate Parts
1,3, and 5 (ring) of Pattern 3:

1. To change Part 2 of Pattern 3, use the Send_Command 'P3_2-XXX' where:
Time increment = 10ms
Default at reset = 20
Example:
Issue the Send_Command
SEND_COMMAND DTMF,'P3_2-25'
to change Part 2 of Pattern 3 from a value of 200ms (.2 sec) to 250ms (.250 sec).
2. To change Part 4 of Pattern 3, use the Send_Command 'P3_4-XXX' where:
Time increment = 10ms
Default at reset = 20
Example:
Issue the Send_Command
SEND_COMMAND DTMF,'P3_4-25'
to change Part 4 of Pattern 3 from a value of 200ms to (.2 sec) to 250ms (.250 sec).
3. The normal length of time from the start of any pattern to its end time is usually 2
seconds, for most applications. If you increase the time value for any part of a
pattern, make sure to decrease another part by the same amount, maintaining the 2

```
    second overall time for the pattern. For example, if you increased the value
of Parts 2
    and 4 of Pattern 3 by 5ms each, decrease part 3 by 10ms.
    Distinctive Ring Send_Commands
    The following Send_Commands are available for changing the default
distinctive ring
    patterns.
------------------------------------------------------------------------------

    'P1_1-XXX'
        Pattern 1 Part 1 high time for distinctive ring
        Time increment = 10ms
        Default at reset = 20
        Example:
        SEND_COMMAND DTMF,'P1_1-300'
        Sets the distinctive ring Pattern 1 Part 1 high time for 3.0 sec
        (3000ms)

    'P1_2-XXX'
        Pattern 1 Part 2 low time for distinctive ring
        Time increment = 10ms
        Default at reset = 0
        Example:
        SEND_COMMAND DTMF,'P1_2-05'
        Sets the distinctive ring Pattern 1 Part 2 high time for .05 sec
        (50ms)

    'P1_3-XXX'
        Pattern 1 Part 3 high time for distinctive ring
        Time increment = 10ms
        Default at reset = 0
        Example:
        SEND_COMMAND DTMF,'P1_3-05'
        Sets the distinctive ring Pattern 1 Part 3 high time for .05 sec
        (50ms)

    'P1_4-XXX'
        Pattern 1 Part 4 low time for distinctive ring
        Time increment = 10ms
        Default at reset = 0
        Example:
        SEND_COMMAND DTMF,'P1_4-05'
        Sets the distinctive ring Pattern 1 Part 4 high time for .05 sec
        (50ms)

    'P1_5-XXX'
        Pattern 1Part 5 high time for distinctive ring
        Time increment = 10ms
        Default at reset = 0
        Example:
        SEND_COMMAND DTMF,'P1_5-05'
        Sets the distinctive ring Pattern 1 Part 5 high time for .05 sec
        (50ms)

    'P2_1-XXX'
        Pattern 2 Part 1 high time for distinctive ring
        Time increment = 10ms
```

```
    Default at reset = 80
    Example:
    SEND_COMMAND DTMF,'P2_1-90'
    Sets the distinctive ring Pattern 2 Part 1 high time for .9 sec
    (900ms)

'P2_2-XXX'
    Pattern 2 Part 2 low time for distinctive ring
    Time increment = 10ms
    Default at reset = 40
    Example:
    SEND_COMMAND DTMF,'P2_2-50'
    Sets the distinctive ring Pattern 2 Part 2 low time for .5 sec
    (500ms)

'P2_3-XXX'
    Pattern 2 Part 3 high time for distinctive ring
    Time increment = 10ms
    Default at reset = 40
    Example:
    SEND_COMMAND DTMF,'P2_3-50'
    Sets the distinctive ring Pattern 2 Part 3 high time for .5 sec
    (500ms)

'P2_4-XXX'
    Pattern 2 Part 4 low time for distinctive ring
    Time increment = 10ms
    Default at reset = 0
    Example:
    SEND_COMMAND DTMF,'P2_4-05'
    Sets the distinctive ring Pattern 2 Part 4 low time for .5 sec
    (50ms)

'P2_5-XXX'
    Pattern 2 Part 5 high time for distinctive ring
    Time increment = 10ms
    Default at reset = 0
    Example:
    SEND_COMMAND DTMF,'P2_5-05'
    Sets the distinctive ring Pattern 2 Part 5 high time for .5 sec
    (50ms)

'P3_1-XXX'
    Pattern 3 Part 1 high time for distinctive ring
    Time increment = 10ms
    Default at reset = 30
    Example:
    SEND_COMMAND DTMF,'P3_1-35'
    Sets the distinctive ring Pattern 3 Part 1 high time for .35 sec
    (350ms)

'P3_2-XXX'
    Pattern 3 Part 2 low time for distinctive ring
    Time increment = 10ms
    Default at reset = 20
    Example:
    SEND_COMMAND DTMF,'P3_2-25'
```

```
    Sets the distinctive ring Pattern 3 Part 2 low time for .25 sec
    (250ms)

'P3_3-XXX'
    Pattern 3 Part 3 high time for distinctive ring
    Time increment = 10ms
    Default at reset = 100
    Example:
    SEND_COMMAND DTMF,'P3_3-110'
    Sets the distinctive ring Pattern 3 Part 3 high time for 1.1 sec
    (1100ms)

'P3_4-XXX'
    Pattern 3 Part 4 low time for distinctive ring
    Time increment = 10ms
    Default at reset = 20
    Example:
    SEND_COMMAND DTMF,'P3_4-25'
    Sets the distinctive ring Pattern 3 Part 1 low time for .25 sec
    (250ms)

'P3_5-XXX'
    Pattern 3 Part 5 high time for distinctive ring
    Time increment = 10ms
    Default at reset = 30
    Example:
    SEND_COMMAND DTMF,'P3_5-35'
    Sets the distinctive ring Pattern 3 Part 1 high time for .35 sec
    (350ms)

'P4_1-XXX'
    Pattern 4 Part 1 high time for distinctive ring
    Time increment = 10ms
    Default at reset = 40
    Example:
    SEND_COMMAND DTMF,'P4_1-45'
    Sets the distinctive ring Pattern 4 Part 1 high time for .45 sec
    (450ms)

'P4_2-XXX'
    Pattern 4 Part 2 low time for distinctive ring
    Time increment = 10ms
    Default at reset = 20
    Example:
    SEND_COMMAND DTMF,'P4_2-25 '
    Sets the distinctive ring Pattern 4 Part 2 high time for .25 sec
    (250ms)

'P4_3-XXX'
    Pattern 4 Part 3 high time for distinctive ring
    Time increment = 10ms
    Default at reset = 40
    Example:
    SEND_COMMAND DTMF,'P4_3-45 '
    Sets the distinctive ring Pattern 4 Part 1 high time for .45 sec
    (450ms)
```

```
    'P4_4-XXX'
        Pattern 4 Part 4 low time for distinctive ring
        Time increment = 10ms
        Default at reset = 20
        Example:
        SEND_COMMAND DTMF,'P4_4-25 '
        Sets the distinctive ring Pattern 4 Part 1 high time for .25 sec
        (250ms)

    'P4_5-XXX'
        Pattern 4 Part 5 high time for distinctive ring
        Time increment = 10ms
        Default at reset = 80
        Example:
        SEND_COMMAND DTMF,'P4_5-90 '
        Sets the distinctive ring Pattern 4 Part 1 high time for 900ms


    AXCESS program example 1
*********************************************************************

    PROGRAM_NAME='REDIAL'
    (*   DATE:04/15/96    TIME:15:04:04    *)

(***************************************************************************
    (
    ( REDIAL.AXS
    ( THIS PROGRAM IMPLEMENTS AN AUTOMATIC DIALER THAT DIALS A
    ( NUMBER IN RESPONSE TO A BUTTON PUSH ON A KEYPAD.  IF THE
    ( NUMBER IS BUSY, THE USER IS NOTIFIED VIA A RS232 TERMINAL
    ( ATTACHED TO THE SERIAL PORT ON THE MASTER, AND THE CARD
    ( WILL RETRY 6 ADDITIONAL TIMES AT 5 SECOND INTERVALS.  IF THE
    ( DIALED NUMBER RINGS, THE USER WILL BE NOTIFIED VIA A RS232
    ( TERMINAL ATTACHED TO THE SERIAL PORT ON THE MASTER.
    (
    ( NOTE THAT TO DEMO THIS PROGRAM,  A MASTER, A DTMF+ CARD,
    ( A PC RUNNING AXCESS, AND A PHONE LINE ARE ALL THAT ARE
    ( NECESSARY (IN ADDITION TO AN AXCESS CARDFRAME).
    (
    ( MODIFY THIS PROGRAM WHERE THE COMMENT "(* INSERT DESIRED
    ( NUMBER HERE IN PLACE OF 555-1212 *)" IS WRITTEN.  REPLACE THE
    ( NUMBER 555-1212 WITH THE NUMBER THAT IS DESIRED TO BE
    ( CALLED.
    (
    ( AFTER THE PROGRAM HAS BEEN DOWNLOADED TO THE
    ( MASTER CARD, HIGHLIGHT THE LINE "PUSH[128,1]" AND PRESS
    ( CONTROL 'A ' ON THE PC KEYBOARD.  THEN, PRESS F4 TO ENTER THE
    ( TERMINAL PROGRAM.  PROGRESS MESSAGES FROM THE MASTER
    ( SHOULD BE SEEN.
    (

***************************************************************************)

    (*********************************************************)
    (*  DEVICE NUMBER DEFINITIONS GO BELOW   *)
    (*********************************************************)
```

```
    DEFINE_DEVICE

    DTMF_CARD = 5

    (***********************************************************)
    (*      CONSTANT DEFINITIONS GO BELOW          *)
    (***********************************************************)
    DEFINE_CONSTANT

    (***********************************************************)
    (*        VARIABLE DEFINITIONS GO BELOW          *)
    (***********************************************************)
    DEFINE_VARIABLE
    STATE                          (*  STATE OF THE SOFTWARE "STATE MACHINE"
*)
    BUSY_COUNT             (*  NUMBER OF RETRIES  *)

    (***********************************************************)
    (*        LATCHING DEFINITIONS GO BELOW         *)
    (***********************************************************)
    DEFINE_LATCHING

    (***********************************************************)
    (*  MUTUALLY EXCLUSIVE DEFINITIONS GO BELOW   *)
    (***********************************************************)
    DEFINE_MUTUALLY_EXCLUSIVE

    (***********************************************************)
    (*               STARTUP CODE GOES BELOW                *)
    (***********************************************************)
    DEFINE_START
    BUSY_COUNT=0
    STATE=255                                (*  ESSENTIALLY "NO STATE"  *)
    (***********************************************************)
    (*      THE ACTUAL PROGRAM GOES BELOW        *)
    (***********************************************************)
    DEFINE_PROGRAM


(*****************************************************************************
    (
    ( IF KEY 1 ON THE KEYPAD IS PUSHED, PLACE THE CARD ON HOOK (IN
    ( CASE IT WAS OFF HOOK).  WAIT 2 SECONDS BEFORE CHANGING
    STATE
    ( TO STATE 2.
    (

*****************************************************************************)

    PUSH[128,1]
    {
      SEND_COMMAND DTMF_CARD,'ON HOOK'
      WAIT 20
       STATE=2
    }
```

```
(***********************************************************************
    (
    ( TAKE THE CARD OFF HOOK.  WAIT 2 SECONDS FOR DIAL TONE.  IF IT
    IS
    ( NOT RECEIVED, SEND AN ERROR MESSAGE AND SHUT DOWN (GO TO
    ( "NO STATE").
    (
***********************************************************************)

    IF(STATE=2)
    {
        STATE=3
        SEND_COMMAND DTMF_CARD,'OFF HOOK'
        WAIT 20 'WAIT FOR DIAL TONE'
        {
          SEND_STRING 0,"'ERROR: NO DIAL TONE',13,10"
          SEND_COMMAND DTMF_CARD,'ON HOOK'
          STATE=255
        }
    }


(***********************************************************************
    (
    ( IF DIAL TONE IS RECEIVED, DIAL THE NUMBER
    (
***********************************************************************)

    IF(STATE=3)
    {
        PUSH[DTMF_CARD,47](*DIAL_TONE*)
        {
          CANCEL_WAIT 'WAIT FOR DIAL TONE'
          SEND_COMMAND DTMF_CARD,'DIAL-555-1212'(* INSERT DESIRED
          NUMBER HERE IN PLACE OF 555-1212 *)
          STATE=4
        }
    }


(***********************************************************************
    (
    ( IF 12 SECONDS PASS AND THERE IS NO BUSY OR RINGING, SEND AN
    ( ERROR MESSAGE AND SHUT DOWN (GO TO "NO STATE").
    (
***********************************************************************)

    IF(STATE=4)
    {
        STATE=5
        WAIT 120 'WAIT FOR RESPONSE TO DIAL'
        {
          SEND_STRING 0,"'ERROR: NO RESPONSE TO DIAL',13,10"
```

```
          SEND_COMMAND DTMF_CARD,'ON HOOK'
          STATE=255
        }
    }


(*****************************************************************************
    (
    ( IF THE DIALED NUMBER IS BUSY, SEND A MESSAGE INDICATING
    SUCH
    ( AND GO TO STATE 6. IF THE DIALED NUMBER IS RINGING, INDICATE
    ( SUCH AND SHUT DOWN (GO TO "NO STATE").
    (
*****************************************************************************)

    IF(STATE=5)
    {
        PUSH[DTMF_CARD,34] (*OUTGOING_BUSY*)
        {
          CANCEL_WAIT 'WAIT FOR RESPONSE TO DIAL'
          SEND_COMMAND DTMF_CARD,'ON HOOK' (*NUMBER IS BUSY SO
          HANG UP*)
          SEND_STRING 0,"'DIALED NUMBER IS BUSY',13,10"
          STATE=6
        }

        PUSH[DTMF_CARD,35] (*OUTGOING_RING*)
        {
          CANCEL_WAIT 'WAIT FOR RESPONSE TO DIAL'
          SEND_STRING 0,"'REMOTE PHONE RINGING',13,10"
          BUSY_COUNT=0
          STATE=255
        }
    }


(*****************************************************************************
    (
    ( IF THE DIALED NUMBER WAS BUSY, INCREMENT THE "BUSY_COUNT".
    ( IF THIS IS NOT THE 7TH RETRY, WAIT 5 SECONDS AND TRY AGAIN.
    ( ELSE, SHUT DOWN (GO TO "NO STATE").
    (
*****************************************************************************)

    IF(STATE=6)
    {
      BUSY_COUNT = BUSY_COUNT+1
      STATE=255
      IF(BUSY_COUNT<7)
      {
        WAIT(50)
          STATE=2
      }ELSE{
        SEND_STRING 0,"'MAXIMUM RETRIES HAS BEEN REACHED',13,10"
        BUSY_COUNT=0
```

```
  }
}

(*********************************************************)
(*                          END OF PROGRAM                 *)
(*  DO NOT PUT ANY CODE BELOW THIS COMMENT  *)
(*********************************************************)


AXCESS program example 2
*********************************************************************

*********************************************************************
* Caller ID
*********************************************************************
The AXC-DTMF+ provides report capability for receiving Caller ID
information.

AXC-DTMF+ Card Caller ID Data String Description

"CLID-MMDDHHII-NNNNNNNNNN-
TTTTTTTTTTTTTTTTTTT0 "
Caller ID data string sent from the AXC-
DTMF+ card to the AXCESS system. Caller
ID is a service obtained from the telephone
company and is passed from
the central office between the first and second
incoming ring.
The data string uses the following format:

M = month
D = day
H = hour
I = min
N = phone number
T = text
0 = 0x00 (null)
The string is always 48 bytes including the
null character. Spaces (0x20) are used as
filler in the text field or for any field not
received.

In order for the program to work, Caller ID service must be provided from
your local telephone company.  The following is an AXCESS program example
for Caller ID.

PROGRAM_NAME='DTMF+ CALLER-ID SAMPLE, WS'
(*   DATE:07/30/96    TIME:10:39:27    *)
(*********************************************************************)
(*                                                                   *)
(* THIS PROGRAM RECEIVES CALLER-ID INFORMATION IN THE FORM OF A STRING    *)
(* FROM AN INCOMMING CALL (VIA DTMF+ CARD). IT THEN DISPLAYS IT ON FOUR   *)
(* BUTTONS ON A TOUCHPANEL AND ALSO ON A DISPLAY TERMINAL HOOKED UP TO    *)
(* THE MASTER CARD'S PROGRAM PORT.                                        *)
(*                                                                   *)
(* JUST CREATE FOUR VARIABLE TEXT BUTTONS ON A TOUCHPANEL WITH VARIABLE   *)
(* TEXT NUMBERS 1, 2, 3, AND 4 AND SEE THE CALLER-ID INFORMATION APPEAR.  *)
```

```
(* OR YOU CAN WATCH THE DATA ON YOUR PC SCREEN, JUST SELECT <CTRL>-T TO   *)
(* ENTER AXCESS' TERMINAL MODE AND SEE THE DATA APPEAR.                   *)
(*                                                                        *)
(* THE DATA SHOULD APPEAR BETWEEN THE FIRST AND SECOND RING.              *)
(*                                                                        *)
(**************************************************************************)
(*********************************************************)
(*          DEVICE NUMBER DEFINITIONS GO BELOW             *)
(*********************************************************)
DEFINE_DEVICE

DTMF =  16    (* AXC-DTMF+   V 2.00                                       *)
TP   = 128    (* TOUCHPANEL                                               *)

(*********************************************************)
(*               CONSTANT DEFINITIONS GO BELOW           *)
(*********************************************************)
DEFINE_CONSTANT

(*********************************************************)
(*               VARIABLE DEFINITIONS GO BELOW           *)
(*********************************************************)
DEFINE_VARIABLE

DTMF_BUFFER[100]                        (* INCOMING DATA FROM DTMF CARD  *)
ID_DATA[100]                            (* CALLER-ID COPY OF ABOVE       *)
ID_DATE[5]                              (* CALLER-ID DATE                *)
ID_TIME[5]                              (* CALLER-ID TIME                *)
ID_NUMBER[12]                           (* CALLER-ID NUMBER              *)
ID_NAME[20]                             (* CALLER-ID NAME                *)

(*********************************************************)
(*               LATCHING DEFINITIONS GO BELOW           *)
(*********************************************************)
DEFINE_LATCHING

(*********************************************************)
(*       MUTUALLY EXCLUSIVE DEFINITIONS GO BELOW         *)
(*********************************************************)
DEFINE_MUTUALLY_EXCLUSIVE

(*********************************************************)
(*           SUBROUTINE DEFINITIONS GO BELOW             *)
(*********************************************************)

(*********************************************************)
(*                STARTUP CODE GOES BELOW                *)
(*********************************************************)
DEFINE_START

CREATE_BUFFER DTMF,DTMF_BUFFER          (* START LISTENING TO THE CARD   *)

(*********************************************************)
(*             THE ACTUAL PROGRAM GOES BELOW             *)
(*********************************************************)
DEFINE_PROGRAM
```

```
IF (FIND_STRING(DTMF_BUFFER,'CLID-',1))  (* START OF STRING FOUND         *)
{
  WAIT 20 'NO VALID STRING FOUND'        (* TIME-OUT AFTER 2.0 SECONDS    *)
  {
    CANCEL_WAIT_UNTIL 'WAIT FOR END OF STRING' (* DON'T WAIT FOR THE REST *)
    CLEAR_BUFFER DTMF_BUFFER             (* CLEAR DATA IN BUFFER          *)
    SEND_STRING 0,"'INCOMPLETE STRING RECEIVED',10,13" (* ERROR MESSAGE   *)
  }

  WAIT_UNTIL (FIND_STRING(DTMF_BUFFER,"$00",1)) 'WAIT FOR END OF STRING'
  {                                      (* THE $00 IS THE LAST CHARACTER *)
                                         (* OF THE EXPECTED STRING        *)
    CANCEL_WAIT 'NO VALID STRING FOUND'  (* NO TIME-OUT NECESSARY         *)
    ID_DATA = DTMF_BUFFER                (* COPY CONTENTS, SO MORE DATA   *)
                                         (*  WILL NOT AFFECT PROCESSING   *)
    CLEAR_BUFFER DTMF_BUFFER             (* CLEAR DATA IN BUFFER          *)

                                         (* PROCESS THE DATA FOUND        *)
    ID_DATE   = "MID_STRING(ID_DATA,6,2),'/',MID_STRING(ID_DATA,8,2)"

    ID_TIME   = "MID_STRING(ID_DATA,10,2),':',MID_STRING(ID_DATA,12,2)"

    ID_NUMBER = "MID_STRING(ID_DATA,15,3),'-',
                 MID_STRING(ID_DATA,18,3),'-',MID_STRING(ID_DATA,21,4)"

    ID_NAME   =  MID_STRING(ID_DATA,26,20)

    (* NOTE: THE FOLLOWING DATA WILL APPEAR ON THE TOUCHPANEL             *)
    SEND_COMMAND TP,"'TEXT1-NAME:   ',ID_NAME"   (* CALLER'S NAME        *)
    SEND_COMMAND TP,"'TEXT2-NUMBER: ',ID_NUMBER" (* CALLER'S NUMBER      *)
    SEND_COMMAND TP,"'TEXT3-DATE:   ',ID_DATE"   (* DATE OF THE CALL     *)
    SEND_COMMAND TP,"'TEXT4-TIME:   ',ID_TIME"   (* TIME OF THE CALL     *)

    (* NOTE: THE FOLLOWING DATA WILL APPEAR IN THE TERMINAL EMULATOR      *)
    SEND_STRING 0,"'NAME:   ',ID_NAME,10,13"     (* CALLER'S NAME        *)
    SEND_STRING 0,"'NUMBER: ',ID_NUMBER,10,13"   (* CALLER'S NUMBER      *)
    SEND_STRING 0,"'DATE:   ',ID_DATE,' (MONTH/DATE)',10,13" (* THE DATE  *)
    SEND_STRING 0,"'TIME:   ',ID_TIME,10,13"     (* TIME OF CALL         *)
  }
}

(***********************************************************)
(*                     END OF PROGRAM                      *)
(*        DO NOT PUT ANY CODE BELOW THIS COMMENT           *)
(***********************************************************)
```

---

27 AXC-IRS IR/Serial Card

27.1 CHANNELS

CHANNEL	FUNCTION
1-240	IR generation functions
241-252	Ignored

27.2 COMMANDS

(SEND_COMMAND DEV,"command")

```
'INITIR' initializes EEPROM to have 8 fixed IR functions which are the
   same only function numbers 2, 4, 6, and 8 have no carrier
'CAROFF' overrides and turns off carrier on all outgoing functions
'CARON' (default) restores carrier to normal as dictated by function
'IROFF' turns IR function off if one was in progress, and clears the
   buffer below

Up to 24 bytes of the following commands (added V1.60) will be buffered
  and performed in the order received:

* "'CH',<TV channel>" generates the IR digit pulses necessary to
     select the TV channel specified.  Channels below 100 are generated
     as two digit pulses, and if channel is >= 100 then IR function 127
     is generated for the one hundred digit.  If IR function 21 exists
     (ENTER for TVs that have this function), then it will follow the
     digit pulses.  Requires 4 bytes in buffer
* "'CTON',<time in tenth seconds>" sets the IR on pulse time for the
     channel digits and 'SP' pulses.  Default time is 5 (.5 second).
     Time is stored in permanent memory until changed.  Requires 2 bytes
     in the buffer
* "'CTOF',<time in tenth seconds>" sets the IR off time between
     pulses for the channel digits and 'SP' commands.  Default time
     is 5 (.5 second).  Time is stored in permanent memory.  Requires 2
     bytes in the buffer
* "'SP',<IR out>" generates a single pulse of the specified IR
     function.  Pulse times are set by 'CTON' and 'CTOF'. Requires 1
     byte in the buffer
* "'CP',<IR out>" generates a single pulse of the specified IR function
     like the 'SP' command, but clears the buffer first
* 'XCHM-<extended channel mode(0-3)>' Change the output pattern for the
     XCH send command.
     Mode 0:  [x][x]<x><enter>
     Example:  'XCH 3'    The resulting IR would be 3-enter.
     Example:  'XCH 34'   The resulting IR would be 3-4-enter.
     Example:  'XCH 343'  The resulting IR would be 3-4-3-enter.

     Mode 1:  <x><x><x><enter>
     Example:  'XCH 3'    The resulting IR would be 0-0-3-enter.
     Example:  'XCH 34'   The resulting IR would be 0-3-4-enter.
     Example:  'XCH 343'  The resulting IR would be 3-4-3-enter.

     Mode 2:  <x><x><x>
     Example:  'XCH 3'    The resulting IR would be 0-0-3.
     Example:  'XCH 34'   The resulting IR would be 0-3-4.
```

```
     Example:  'XCH 343'  The resulting IR would be 3-4-3.

     Mode 3:  [[100][100]....]<x><x>
     Example:  'XCH 3'    The resulting IR would be 0-3.
     Example:  'XCH 34'   The resulting IR would be 0-3-4.
     Example:  'XCH 343'  The resulting IR would be 100-100-100-4-3.

* 'XCH<Channel 0-999>' Produdes the IR according to the pattern set by

 the XCHM send command.
```

28 AXC-MIDI MIDI Card

28.1 COMMANDS

(SEND_COMMAND DEV,”command”)

```
    'RXON' enables card to send incoming received characters to Master.
       This command is automatically sent by Master when a
       'CREATE_BUFFER' program instruction is executed
    'RXOFF' (default) card will not pass on received characters to
       Master
    'RXCLR' any characters waiting in the receive buffer waiting to be
       sent to Master will be cleared
    'TXCLR' any characters waiting in the transmit out buffer will
       be cleared and transmission will stop
    'OUT=IN' card will automatically transmit OUT any characters received
       from IN
    'OUT<>IN' (default) will not automatically transmit OUT any
       characters from IN

--------------------------------------------------------------------------------
```

29 AXC-MSE Mouse Card

29.1 CHANNELS

CHANNEL FUNCTION

1 - while channel is on, moves mouse N @ Speed #1
2 - while channel is on, moves mouse NNE @ Speed #1
3 - while channel is on, moves mouse NE @ Speed #1
4 - while channel is on, moves mouse ENE @ Speed #1
5 - while channel is on, moves mouse E @ Speed #1
6 - while channel is on, moves mouse ESE @ Speed #1
7 - while channel is on, moves mouse SE @ Speed #1
8 - while channel is on, moves mouse SSE @ Speed #1
9 - while channel is on, moves mouse S @ Speed #1
10 – while channel is on, moves mouse SSW @ Speed #1
11 - while channel is on, moves mouse SW @ Speed #1
12 - while channel is on, moves mouse WSW @ Speed #1
13 - while channel is on, moves mouse W @ Speed #1
14 - while channel is on, moves mouse WNW @ Speed #1
15 - while channel is on, moves mouse NW @ Speed #1
16 - while channel is on, moves mouse NNW @ Speed #1

17 - while channel is on, moves mouse N @ Speed #2
18 - while channel is on, moves mouse NNE @ Speed #2
19 - while channel is on, moves mouse NE @ Speed #2
20 - while channel is on, moves mouse ENE @ Speed #2
21 - while channel is on, moves mouse E @ Speed #2
22 - while channel is on, moves mouse ESE @ Speed #2
23 - while channel is on, moves mouse SE @ Speed #2
24 - while channel is on, moves mouse SSE @ Speed #2
25 - while channel is on, moves mouse S @ Speed #2
26 - while channel is on, moves mouse SSW @ Speed #2
27 - while channel is on, moves mouse SW @ Speed #2
28 - while channel is on, moves mouse WSW @ Speed #2
29 - while channel is on, moves mouse W @ Speed #2
30 - while channel is on, moves mouse WNW @ Speed #2
31 - while channel is on, moves mouse NW @ Speed #2
32 - while channel is on, moves mouse NNW @ Speed #2

33 - while channel is on, left button is down
34 - while channel is on, right button is down

29.2 COMMANDS

(SEND_COMMAND DEV,"command")

```
'P<speed # 1-2>R<speed 1-255>' Set speed #a to b.  a is either 1 or 2.
          Values for b will have to be played with, the range
          is 1 to 255.  A value of 1 for b will provide about
          1.5 mouse ticks per second (actually 1.5625)- this is
          very slow.  A value of 255 for b will provide 398 mouse
          ticks per second very fast.
```

---

30 AXC-OXM Oxmoor Card

30.1 CHANNELS

CHANNEL **FUNCTION**

1 while channel is on, ramps volume up (increase)
2 while channel is on, ramps volume down (decrease)
3 while channel is on, volume is muted (lowest volume), and when channel is turned off volume level is restored to previous level

10 while channel is on, the PRESET output is asserted.
11 while channel is on, the PRIORITY output is asserted.

Note: For setting ramp speed and presets, see SEND_COMMAND programming instruction for this card. For reading current volume level and displaying bargraphs see CREATE_LEVEL and SEND_LEVEL programming instructions. Oxmoor volume level uses level 1.

30.2 COMMANDS

(SEND_COMMAND DEV,"command")

```
'P0L<level 0-255|0-100%>[T<time 0-255 in tenth seconds]'

     Level 0 is lowest volume (same as mute) and 255 or 100% is
     maximum volume

     Ramps volume from current level to a specified preset level
     or percentage at the current rate or optionally in a specified
     amount of time

   Example of usage:
     'P0L50%' ramps volume to 50% mid level at the current ramp rate
     'P0L255T20' ramps volume to highest level in 2 seconds

'P0R<time 0-255 in tenth seconds>[U|D]'
   Sets the ramp rate where the time is the time to ramp the full
   range both down to up and up to down or optionally just down to
   up or just up to down

   Example of usage:
     'P0R50' sets ramp rate to 5 seconds full range from down to up
        and up to down
     'P0R75U' sets ramp rate to 7.5 seconds full range from down to
        up only

Version 2.00 and above treats both 'P0' & 'P1' commands the same.
Versions less than 2.00 did not support 'P1' at all.
```

---

31 AXC-PRN Parallel Printer Card

```
    >> Use the SEND_STRING instruction to send characters to parallel
         output port

--------------------------------------------------------------------------------
```

32 AXC-PTI Pan/Tilt Card

32.1 CHANNELS

CHANNEL **FUNCTION**

1 while channel is on, pans right at current speed
2 while channel is on, tilts down at current speed
5 while channel is on, pans left at current speed
6 while channel is on, tilts up at current speed
10 while channel is on, pans right at max 100% speed
11 while channel is on, pans left at max 100% speed
12 while channel is on, tilts down at max 100% speed
13 while channel is on, tilts up at max 100% speed
14 while channel is on, pans right at 50% speed
15 while channel is on, pans left at 50% speed
16 while channel is on, tilts down at 50% speed
17 while channel is on, tilts up at 50% speed
20 channel is on (status only) if pan is seeking to preset (V2.23)
21 channel is on (status only) if tilt is seeking to preset (V2.23)

Level Function

1 voltage output channel 1, and joystick/slider control (0-255)
2 voltage output channel 2, and joystick/slider control (0-255)
5 voltage input channel 1 (0-65535; 0-255 Rev A cards)
6 voltage input channel 2 (0-65535; 0-255 Rev A cards)

Note: For setting ramp speed and presets, see SEND_COMMAND programming instruction for this card. For reading current positions and displaying bargraphs see CREATE_LEVEL and SEND_LEVEL programming instructions.

32.2 COMMANDS

(SEND_COMMAND DEV,"command")

```
Revision A cards have 8 bit input resolution with a RANGE of 255.
Revision B cards have 10 bit resolution with a RANGE of 65535.

* 'G<output channel 1-2>L<position 0-RANGE>
     Position 0 is one end of the potentiometer (lowest voltage)
     and position RANGE is the other end of the potentiometer
     (highest voltage) with RANGE/2 (128 or 32768) as the middle.
     Channel 1 is pan and channel 2 is tilt

     Turns on the specified output channel at the current speed
     (voltage) until the specified position as read by the input
     channel is reached (go to a preset position using an input
     channel potentiometer as a reference)

* 'G<output channel 1-2>S<speed 0-127>
     Sets the current speed (output voltage) for future positional
     commands.  Speed 0 is slowest and speed 127 (default) is the
     fastest.
```

* 'G<output channel 1-2>D<deviation 0-127>
  Sets the current maximum position deviation allowed for future positional commands. Deviation 0 is most accurate, but can have some jitter, so the default is 2, ie. the position can be within + or - 2 from the specified position

* 'G<output channel 1-2>A<distance 0-127>S<speed 0-127> (added V1.02)
  Temporarily slows the speed to that specified when within the distance specified away from future preset commands

  Example of usage:
    'G1A5S20' slows the pan speed to 20 when within 5 position units of the preset; this is a good setting for Vicon 6035 pan and tilt typically

---

33 AXC-PTC Precision Time Card

33.1 COMMANDS

(SEND_COMMAND DEV,"command")

```
    'CLOCK mm-dd-yy hh:mm:ss' sets the AXC-PTC clock

       Example of usage:
         'CLOCK 01-08-93 19:16:00' sets the AXC-PTC clock to 7:16 PM
            on January 8, 1993

    'UPDATE-hh:mm:ss' sets the frequency with which the AXCESS system
       clock will be updated by the AXC-PTC

       Example of usage:
         'UPDATE-??:?0:00' sets update frequency to once every 10 mins

    'SYSTIME' updates the Master's clock with the AXC-PTC clock

-------------------------------------------------------------------------------
```

34 AXC-SMP AXcess (SMPTE) Card

34.1 COMMANDS

(SEND_COMMAND DEV,"command")

```
'TIME <PUSH channel>-<hh:mm:ss.ff>' programs card to do a PUSH
   of the specified channel upon match of the specified incoming
   time.  If another TIME command is received with the same PUSH
   channel, the new time will replace the previous one (this is
   NOT true for V2.00 and later where the only way to delete
   TIME commands is with a CLEAR command)

   Example of usage:
     'TIME 2-01:06:05.15' will send a PUSH of channel 2 at time
        equals 1 hour, 6 minutes, 5 seconds, and frame 15

'CLEAR' clears all 'TIME' commands
'FRAME' commands the card to send the current incoming time to the
   master as a string in the format 'hh:mm:ss.ff'
'FRAME ON[-<rate 1-255 in tenth seconds>]' commands the card to send
   the current incoming time to the master as a string at the
   optional periodic time rate.  Default with no rate specified is
   1 second

   Example of usage:
     'FRAME ON-5' will send the incoming time every .5 second

'FRAME OFF' cancels a 'FRAME ON' command
'SEND ON[-<hh:mm:ss.ff>]' begins generating outgoing time code at
   the optionally specified time.  If no time is specified then the
   first 'SEND ON' command after power up will start at time
   00:00:00.00, otherwise, time continues from where the last
   'SEND OFF' command stopped it
'SEND OFF' discontinues or pauses generating outgoing time code
'TFRAME' commands the card to send the current outgoing time to the
   master as a string in the format 'hh:mm:ss.ff'
'TFRAME ON[-<rate 1-255 in tenth seconds>' commands the card to
   send the current outgoing time to the master as a string at the
   optional periodic time rate.  Default with no rate specified is
   1 second
'TFRAME OFF' cancels a 'TFRAME ON' command

-------------------------------------------------------------------------------
```

35 AXC-SP Speech Card

```
    >> Use the SEND_STRING instruction to send ASCII English text strings
         followed by a carriage return.  The card will converts any text
         to speech (unlimited vocabulary).  Sometimes it is necessary to
         spell differently to achieve better pronunciation.  The AXC-SPE
         has the ability to generate tones and music as well as vary pitch,
         tone, rate, and volume to achieve even better sound quality

         Example of usage:
           SEND_STRING SPEECH,"'V C R PLAY',$0D"
```

---

36 AXC-SPII Speech Card II

```
    >> Use the SEND_STRING instruction to send ASCII English text strings
         followed by a carriage return.  The card will converts any text
         to speech (unlimited vocabulary).  Sometimes it is necessary to
         spell differently to achieve better pronunciation.  The AXC-SPE
         has the ability to generate tones and music as well as vary pitch,
         tone, rate, and volume to achieve even better sound quality

         Example of usage:
           SEND_STRING SPEECH,"'V C R PLAY',$0D"
```

---

37 AXC-TEMP Temperature Card

37.1 CHANNELS

Level	Function
1	temperature channel 1 in tenths of a degree
2	temperature channel 2 in tenths of a degree
3	temperature channel 3 in tenths of a degree
4	temperature channel 4 in tenths of a degree

Note: For reading temperature channels use CREATE_LEVEL command. If the card is set with JP1 for degrees F and the temperature is 80.5F, the level will read as 805. For the same temperature and JP1 set for degrees C, the level will read as 269 (26.9C)

37.2 COMMANDS

(SEND_COMMAND DEV,"command")

```
    'UPD' causes card to resend all level information
       to master.  This works around power-up problem
       with incorrect levels.

    *Use CREATE_LEVEL TEMP,1,TEMP1 to read zone 1 temp.
```

---

38 AXC-TSM TSM Pan Tilt Card

38.1 CHANNELS

CHANNEL **FUNCTION**

1 while channel is on, pans left at current speed
2 while channel is on, tilts up at current speed
3 while channel is on, zooms in at current speed
4 while channel is on, focuses in at current speed
5 while channel is on, pans right at current speed
6 while channel is on, tilts down at current speed
7 while channel is on, zooms out at current speed
8 while channel is on, focuses out at current speed

Level Function

1 pan position (0-65535)
3 tilt position (24576-40960)
5 zoom position (0-65535)
7 focus position (0-65535)

38.2 COMMANDS

(SEND_COMMAND DEV,"command")

```
'P<output channel 1-4>L<level 0-65535>[T<time 0-255 in tenth
   seconds]'

     Output channel 1 is pan, 2 is tilt, 3 is zoom, and 4 is focus.
     Level 32768 is middle of range

'P<output channel 1-4>R<time 0-255 in tenth seconds>[U|D]'
   Sets the ramp rate of the specified channel where the time is
   the time to ramp the full range both down to up and up to down or
   optionally just down to up or just up to down
```

---

39 AXC-VAI2 Voltage Out/Analog In Card

39.1 CHANNELS

CHANNEL **FUNCTION**

1 while channel is on, ramps voltage channel 1 up (increase)
2 while channel is on, ramps voltage channel 2 up
5 while channel is on, ramps voltage channel 1 down (decrease)
6 while channel is on, ramps voltage channel 2 down
9 while channel is on, turns on AUX channel 3 voltage and when turned off sets AUX channel 5 voltage to zero
10 when channel is on, voltage level for channel 1 is set to 255 (100%) and when turned off voltage level is set back to center
11 when channel is on, voltage level for channel 1 is set to 0 and when turned off voltage level is set back to center
12 when channel is on, voltage level for channel 2 is set to 255 (100%) and when turned off voltage level is set back to center
13 when channel is on, voltage level for channel 2 is set to 0 and when turned off voltage level is set back to center
14 when channel is on, voltage level for channel 1 is set to 192 (75%) and when turned off voltage level is set back to center
15 when channel is on, voltage level for channel 1 is set to 64 (25%) and when turned off voltage level is set back to center
16 when channel is on, voltage level for channel 2 is set to 192 (75%) and when turned off voltage level is set back to center
17 when channel is on, voltage level for channel 2 is set to 64 (25%) and when turned off voltage level is set back to center

Levels Function

1 voltage output channel 1 and, joystick/slider control (0-255)
2 voltage output channel 2 and, joystick/slider control (0-255)
5 voltage input channel 1 (0-255)
6 voltage input channel 2 (0-255)

Note: For setting ramp rates and presets, see SEND_COMMAND programming instruction for this card. For reading current voltage levels and displaying bargraphs see CREATE_LEVEL and SEND_LEVEL programming instructions. Voltage offset and range adjustments for each channel are made with potentiometers on the card. The center (and power up level) is determined by the jumper pins E1, if jumper is across both pins (or MID) then center is 128 (50%) otherwise center will be 0 (LO).

39.2 COMMANDS

(SEND_COMMAND DEV,"command")

```
'P<output channel 1-2>L<level 0-255|0-100%>[T<time 0-255 in tenth
   seconds]'

     Level 0 is the lowest voltage and 255 or 100% is the highest
     voltage

     Ramps specified channel from current level to a specified
```

preset level or percentage at the current rate or optionally in a specified amount of time

Example of usage:
'P1L50%' ramps channel 1 to 50% mid voltage level at the current ramp rate
'P2L255T30' ramps channel 2 to highest voltage level in 3 seconds

'P<output channel 1-2>R<time 0-255 in tenth seconds>[U|D]'
Sets the ramp rate of the specified channel where the time is the time to ramp the full range both down to up and up to down or optionally just down to up or just up to down

Example of usage:
'P1R50' sets ramp rate of channel 1 to 5 seconds full range from down to up and up to down
'P2R75U' sets ramp rate of channel 2 to 7.5 seconds full range from down to up only
'P2R50D' sets ramp rate of channel 2 to 5 seconds full range from up to down only

'G<output channel 1-2>L<position 0-255>
Position 0 is one end of the potentiometer (lowest voltage) and position 255 is the other end of the potentiometer (highest voltage) with 128 the middle of the range

Turns on the specified output channel at the current speed (voltage) until the specified position as read by the input channel is reached (go to a preset position using an input channel as a reference)

'G<output channel 1-2>S<speed 0-127>
Sets the current speed (output voltage) for future positional commands. Speed 0 is slowest and speed 127 (default) is the fastest.

'G<output channel 1-2>D<deviation 0-127>
Sets the current maximum position deviation allowed for future positional commands. Deviation 0 is most accurate, but can have some jitter, so the default is 2, ie. the position can be within + or - 2 from the specified position

'G<output channel 1-2>A<distance 0-127>S<speed 0-127> (added V1.04)
Temporarily slows the speed to that specified when within the distance specified away from future preset commands

40 AXC-VOL Volume Card

40.1 CHANNELS

CHANNEL **FUNCTION**

1 while channel is on, ramps both volume channels up (increase)
2 while channel is on, ramps both volume channels down (decrease)
3 while channel is on, both volume channels are muted (lowest volume), and when channel is turned off volume levels are restored to previous levels
4 while channel is on, ramps volume channel 1 up
5 while channel is on, ramps volume channel 1 down
6 while channel is on, volume channel 1 is muted (lowest volume), and when channel is turned off volume level is restored
7 while channel is on, ramps volume channel 2 up
8 while channel is on, ramps volume channel 2 down
9 while channel is on, volume channel 2 is muted (lowest volume), and when channel is turned off volume level is restored

Note: Ramping a volume channel while the mute channel is on will NOT automatically turn off the mute channel (will not restore) but the ramping will still occur and the volume change will be noticed when the mute channel is turned off. For setting ramp rates and presets, see SEND_COMMAND programming instructions for this card. For reading current volume levels and displaying bargraphs see CREATE_LEVEL and SEND_LEVEL programming instructions. Volume channels 1 and 2 use levels 1 and 2 respectively.

Levels

1 = Output level #1
2 = Output level #2

40.2 COMMANDS

(SEND_COMMAND DEV,"command")

```
'P<output channel 0-2>L<level 0-255|0-100%>[T<time 0-255 in tenth
   seconds]'

     Output channel 0 means both channels 1 and 2.  Level 0 is
     lowest volume (same as mute) and 255 or 100% is maximum volume

     Ramps specified channel(s) from current level to a specified
     preset level or percentage at the current rate or optionally
     in a specified amount of time

   Example of usage:
     'P0L50%' ramps both channels to 50% mid level volume at the
        current ramp rate
     'P1L255T20' ramps channel 1 to highest level volume in 2 seconds
```

```
    'P<output channel 0-2>R<time 0-255 in tenth seconds>[U|D]'
       Sets the ramp rate of the specified channel(s) where the time is
       the time to ramp the full range both down to up and up to down or
       optionally just down to up or just up to down

       Example of usage:
         'P0R50' sets ramp rate of both channels to 5 seconds full range
            from down to up and up to down
         'P2R75U' sets ramp rate of channel 2 to 7.5 seconds full range
            from down to up only
         'P2R50D' sets ramp rate of channel 2 to 5 seconds full range
            from up to down only

    'P1=P2' sets channel 1 level to the same as channel 2
    'P2=P1' sets channel 2 level to the same as channel 1

--------------------------------------------------------------------------------
```

41 AXC-VRG4/AXC-VG24 Voltage Ramp Cards

41.1 CHANNELS

CHANNEL	FUNCTION
1	while channel is on, ramps voltage channel 1 up (increase)
2	while channel is on, ramps voltage channel 2 up
3	while channel is on, ramps voltage channel 3 up
4	while channel is on, ramps voltage channel 4 up
5	while channel is on, ramps voltage channel 1 down (decrease)
6	while channel is on, ramps voltage channel 2 down
7	while channel is on, ramps voltage channel 3 down
8	while channel is on, ramps voltage channel 4 down
9	while channel is on, turns on AUX channel 5 voltage and when turned off sets AUX channel 5 voltage to zero
10	while channel is on, port 1 is set to 255 (100%), when turned off, port 1 returns to its power-up value.
11	while channel is on, port 1 is set to 0 (0%), when turned off, port 1 returns to its power-up value.
12	while channel is on, port 2 is set to 255 (100%), when turned off, port 2 returns to its power-up value.
13	while channel is on, port 2 is set to 0 (0%), when turned off, port 2 returns to its power-up value.
14	while channel is on, port 1 is set to 192 (75%), when turned off, port 1 returns to its power-up value.
15	while channel is on, port 1 is set to 64 (25%), when turned off, port 1 returns to its power-up value.
16	while channel is on, port 2 is set to 192 (75%), when turned off, port 2 returns to its power-up value.
17	while channel is on, port 2 is set to 64 (25%), when turned off, port 2 returns to its power-up value.
18	while channel is on, port 3 is set to 255 (100%), when turned off, port 3 returns to its power-up value.
19	while channel is on, port 3 is set to 0 (0%), when turned off, port 3 returns to its power-up value.
20	while channel is on, port 4 is set to 255 (100%), when turned off, port 4 returns to its power-up value.
21	while channel is on, port 4 is set to 0 (0%), when turned off, port 4 returns to its power-up value.
22	while channel is on, port 3 is set to 192 (75%), when turned off, port 3 returns to its power-up value.
23	while channel is on, port 3 is set to 64 (25%), when turned off, port 3 returns to its power-up value.
24	while channel is on, port 4 is set to 192 (75%), when turned off, port 4 returns to its power-up value.
25	while channel is on, port 4 is set to 64 (25%), when turned off, port 4 returns to its power-up value.

Note: For setting ramp rates and presets, see SEND_COMMAND programming instruction for this card. For reading current voltage levels and displaying bargraphs see CREATE_LEVEL and SEND_LEVEL programming instructions. Voltage channels 1 through 4 use levels 1 to 4 respectively. Voltage offset and range adjustments for each channel are made with potentiometers on the card. The center (and power up level) is determined by the jumper JP2,

if jumper is in MID position then center is 128 (50%) otherwise
center will be 0 (LO).

Levels

1 Output 1
2 Output 2
3 Output 3
4 Output 4

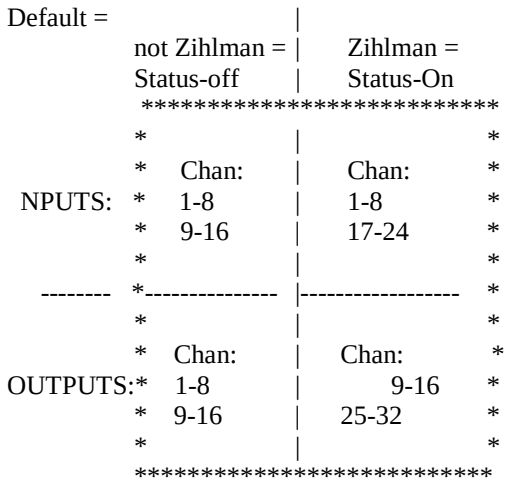
41.2 COMMANDS

(SEND_COMMAND DEV,”command”)

```
'P<output channel 1-4>L<level 0-255|0-100%>[T<time 0-255 in tenth
   seconds]'

     Level 0 is the lowest voltage and 255 or 100% is the highest
     voltage

     Ramps specified channel from current level to a specified
     preset level or percentage at the current rate or optionally
     in a specified amount of time

   Example of usage:
     'P3L50%' ramps channel 3 to 50% mid voltage level at the current
        ramp rate
     'P4L255T30' ramps channel 4 to highest voltage level in 3 seconds

'P<output channel 1-4>R<time 0-255 in tenth seconds>[U|D]'
   Sets the ramp rate of the specified channel where the time is
   the time to ramp the full range both down to up and up to down or
   optionally just down to up or just up to down

   Example of usage:

    'P1R50' sets ramp rate of channel 1 to 5 seconds full range
       from down to up and up to down
    'P2R75U' sets ramp rate of channel 2 to 7.5 seconds full range
       from down to up only
    'P2R50D' sets ramp rate of channel 2 to 5 seconds full range
       from up to down only

'P<output channel 0-4>C<N|L|I>'  (added V1.05)
   Sets the ramping curve of the specified channel to normal
   linear (N this is the default), logarithmic (L), or inverted
   logarithmic (I). Output channel 0 means all channels

   Example of usage:
     'P1CL' sets ramping curve of output channel 1 to logarithmic
```

---

42 AXP-CPI Custom Panel Interface



When Status is ON, input status is tracked by the master because input changes are sent by the CPI-16 as input and output changes. Statements such as:
IF[CPI16,25]
can be used in an AXcess program.

When Status is OFF, input status is not tracked by the master because inputs are sent by the CPI-16 only as input changes.

42.1 COMMANDS

(SEND_COMMAND DEV,"command")

```
'BMODE<which bargraph 1-3><bargraph mode 0-8> sets the specified
   bargraph to operate in one of the following modes:

        0 = (default) normal bar mode
        1 = normal dot mode (only one peak LED on at a time)
        2 = special bar mode (level 0 still has first LED on)
        3 = special dot mode (level 0 still has first LED on)
        4 = inverse normal bar mode
        5 = inverse normal dot mode
        6 = inverse special bar mode
        7 = inverse special dot mode
        8 = individaul element, discrete mode

'NOLMP' disables output drivers.  This is sometimes useful for
   long distances to switches and where no outputs are needed.
'NOSW' disables switch scanning.  In normal operation, the outputs
   are multiplexed with the switches such that the outputs drop out
   momentarily.  The switch scanning can be disabled for outputs
   that must remain constant such as for driving relays
'GLOW<glow level>' sets the channel off back illumination to the
   specified glow level.  This disables and overrides the
   potentiometer setting on the device
'GLOW*' (default) sets the channel off back illumination glow level
   to use the potentiometer setting on the device
```

'DIM<dim level>' sets the channel on illumination for the dim channels
(65-128) to the specified dim level. This disables and overrides
the potentiometer setting on the device
'DIM*' (default) sets the channel on illumination for the dim channels
(65-128) to use the potentiometer setting on the device.

Note: 'DIM' and 'GLOW' commands are mutually exclusive.

AXP-CPI16 HC11D3 Custom Panel Interface

'STATUS-ON'
Causes the CPI-16 to be in Status-On Mode. This command overrides
the hardware
mode setting. Added v2.10.

'STATUS-OFF'
Causes the CPI-16 to be in Status-Off Mode. This command overrides
the hardware
mode setting. Added v2.10.

AXP-CPIL LED Custom Panel Interface

'BMODE<which bargraph 1-3><bargraph mode 0-8> sets the specified
bargraph to operate in one of the following modes:

0 = (default) normal bar mode
1 = normal dot mode (only one peak LED on at a time)
2 = special bar mode (level 0 still has first LED on)
3 = special dot mode (level 0 still has first LED on)
4 = inverse normal bar mode
5 = inverse normal dot mode

```
6 = inverse special bar mode
7 = inverse special dot mode
8 = individaul element, discrete mode
```

43 AXP-SPL4 Four Button LCD Panel

43.1 CHANNELS

CHANNEL **FUNCTION**

```
  251    while channel is on, relay 1 on (energized), else off
  252    while channel is on, relay 2 on (energized), else off
  253    while channel is on, I/O 1 is on (switch to GND), else off
  254    while channel is on, I/O 2 is on (switch to GND), else off
```

43.2 COMMANDS

(SEND_COMMAND DEV,"command")

```
'LIGHT<backlight level 0-9>' sets the backlight level to that
   specified where 0 is off and 9 is full brightness

   Example of usage:
     'LIGHT5' sets the backlight to a mid level brightness of 5

'TIME<timeout in minutes 1-99>' sets the amount of time without
   a switch press before backlight times out and shuts off.  Default
   is 15 minutes

'TIME' resets timeout as if a switch was pressed

'LIGHT' causes an immediate timeout

'OFFSET<switch offset>' sets the offset for the 4 push button
   switches.  If the switch offset is 97, then switch 1 (left most)
   will use channel 97 for its PUSH, RELEASE, and feedback
   channel, and similarly switch 2 through 4 (right most) would use
   channels 98 through 100 respectively.  Default is 1.

'BEEP<beep time in tenth seconds 0-9>' generates a beep of the
   specified time duration.  By sending another beep command before
   the previous one times out, the duration can be extended.  A
   'BEEP0' command will turn off the beeper immediately (added V0.20)

>> Use the SEND_STRING instruction to send characters to LCD screen.
     Each character moves the imaginary cursor one position to the
     right where the following character will appear.  The following
     characters have special meaning:

     Char(decimal)  Desc       Result

          2         STX   Move the cursor to home (line one, column one)
          3         ETX   Move the cursor to end (last line, last
                            column)
          8         BS    Move cursor one position left
          9         HT    Move cursor one position right
          10        LF    Move cursor one position down. If the
                            current position is the bottom line
                            then the screen will scroll up one line
          12        FF    Clears the display and moves the cursor
                            to home (line one, column one)
          13        CR    Move cursor to first of line (column one)
```

17	DC1	Move cursor to location specified by the next two characters. For example: "17,1,2" will move cursor to line 1, column 2

---

44 AXP-EL EL Touch Panel (512x256)

44.1 CHANNELS

CHANNEL	FUNCTION
1-255	Button Push and Feedback

44.2 COMMANDS

(SEND_COMMAND DEV,"command")

```
    'PAGE-<page name>' flips to page with specified page name

       Example of usage:
         'PAGE-VCR' flips to a page named VCR on the panel

    'BEEP' outputs a beep
    'DBEEP' outputs a double beep
    'WAKE' forces EL out of screen saver mode and resets EL timer  (V1.18)
    'SLEEP' forces EL into screen saver mode  (added V1.18)
    'TEXT<text button number 1-255>-<new text to be put in button>'
       changes text in specified text button number.  All text is
       centered in the box.  A '|' character indicates a carriage
       return to begin next line down.  All text remains permanent
       even during power outage until changed with another TEXT
       command or the panel editor

       Example of usage:                                        ------
                                                               | VCR  |
        'TEXT2-VCR|PLAY' changes text button number 2 to display: | PLAY |
                                                                ------
    'FONT<text button number 1-255>-<font size 1-4>' changes font
       size of the text in specified text button number.  Size 1 is
       smallest, size 2 medium, size 3 largest, and size 4 is special
       for displaying graphics symbols.  Font size remains permanent
       even during power outage until changed with another FONT command
       or the panel editor
    'ICON<text button number 1-255>-<border style 0-6>' changes border
       style of the specified text button number.  Border styles are
       as follows:

            0 = no border         4 = double raised
            1 = single wide       5 = single rounded
            2 = double wide       6 = double rounded
            3 = single raised

       Example of usage:
         'ICON2-1' changes border style of text button number 2 to
            single wide

    >> Use the SEND_STRING instruction to send characters to the 16 and 32
         character terminal windows
```

---

45 AXP-EL+ EL Unimount Touch Panels (640x400)

45.1 CHANNELS

CHANNEL	FUNCTION
1-255	Button Push and Feedback

45.2 COMMANDS

(SEND_COMMAND DEV,"command")

```
-------------------------------------------------------------------------------
  COLOR SEND_COMMANDS:
   Color Numbers:
    WHITE       :72-77
    BLACK       :87
    TRANSPARENT :255
-------------------------------------------------------------------------------
New command format starts with @
 Most commands are in what is known as "shorthand" format
 where the data is always one-byte non-ascii data except
 for pages, passwords, text and bitmap names.
-------------------------------------------------------------------------------

    "'@CPG',<color_number>,'<page name>'"
       Sets the page with specified page name background color to the specified
       color only if the specified background color is not the same as the
       current color.

    "'@CPP',<color_number>,'<pop-up page name>'"
       Sets the page with specified pop-up page name background color to the
       specified color only if the specified background color is not the same
       as the current color.

    "'@CFN',<variable text address 1-255>,<color_number>"
       Fill Color On.
       Sets the fill color for ON feedback to the specified color only if the
       specified fill on color is not the same as the current color.

    "'@CFF',<variable text address 1-255>,<color_number>"
       Fill Color Off.
       Sets the fill color for OFF feedback to the specified color only if the
       specified fill off color is not the same as the current color.

    "'@CBN',<variable text address 1-255>,<color_number>"
       Border Color On.
       Sets the border color for ON feedback to the specified color only if the
       specified border on color is not the same as the current color.

    "'@CBF',<variable text address 1-255>,<color_number>"
       Border Color Off.
       Sets the border color for OFF feedback to the specified color only if
       the specified border off color is not the same as the current color.

    "'@CTN',<variable text address 1-255>,<color_number>"
       Text Color On.
       Sets the text color for ON feedback to the specified color only if the
       specified text on color is not the same as the current color.
```

"'@CTF',<variable text address 1-255>,<color_number>"
Text Color Off.
Sets the text color for OFF feedback to the specified color only if the specified text off color is not the same as the current color.

VARIABLE TEXT SEND_COMMANDS:

NOTE:DATA FOR ALL COMMANDS EXCEPT TEXT AND BITMAP
ARE SINGLE BYTE NON-ASCII DATA!!

"'@BMF',<variable text address 1-255>,'<data>'"

Set any/all button parameters by sending embedded codes and data.
Codes are:

'%B',<border 1-27,40,41>	Set Border
'%F',<font 1-8,32-xx>	Set Font
'%T',<text>	Set Text (empty is clear)
'%P',<bitmap>	Set Picture/Bitmap (empty is clear)
'%I',<icon 1-255, 0-clear>	Set Icon
'%J',<alignment of text 1-9>	Set text alignment using telephone Keypad layout (1 = left,top 5 = center,middle 9 = right,bottom)
'%C1',<on fill color>	Set On Fill Color
'%C2',<off fill color>	Set Off Fill Color
'%C3',<on border color>	Set On Border Color
'%C4',<off border color>	Set Off Border Color
'%C5',<on text color>	Set On Text Color
'%C6',<off text color>	Set Off Text Color

"'@SHO',<variable text address 1-255>,<ON/OFF 1-0>"
Turns Button On or Off (show/hide).

"'@ENA',<variable text address 1-255>,<ON/OFF 0-1>"
Enables Button On or Off (enable/disable).

"'@ICO',<variable text address 1-255>,<icon index 0-255>"
Set Icon, 0 is clear.

"'@BMP',<variable text address 1-255>,'<name of bitmap>'"
Set Bitmap.

"'@TXT',<variable text address 1-255>,'<new text to be put in button>'"
Set Text.

"'@UNI',<variable text address 1-255>,'<new text to be put in button>'"
Set Unicode Text.

"'@JUS',<variable text address 1-255>,<new text alignment>"
Set Text Alignment, use numeric keypad layout.
(7 = Left Bottom, 3= Right Top).

"'@FON',<variable text address 1-255>,<font size 1-255>"

Set Font.
Fixed Fonts are as follows:
1 = x-small
2 = small
4 = large

5 = x-large
6 = hollow medium
8 = hollow x-large
Variable Fonts start at 32.

"'@BOR',<variable text address 1-255>,<border style 0-41>"
Set Border only if the specified border is not the same as the current border.
Border styles are as follows:

no_border	0		
no_border_special	1	3dim_rect_1	20
single_line	2	3dim_rect_2	21
double_line	3	3dim_round_1	22
triple_line	4	3dim_round_2	23
single_rounded	5	3dim_neon_1	24
double_rounded	6	3dim_neon_2	25
single_raised	7	3dim_neon_blue	26
double_raised	8	3dim_neon_green	27
triple_raised	9		
double_line_2_single	10	single_diamond	40
double_line_3_single	11	double_diamond	41
double_shadow	12		

MISC. SEND COMMANDS:

"'@PWD-<page flip password>'"
Set page flip password

"'@PRO-<protected setup password>'"
Set protected setup password

"'@PPN-<pop-up page name>;<page name>'"
Activates a popup page with specified pop-up page name on page with specified specified page. If page name is empty, the current page is used.

"'@PPF-<pop-up page name>;<page name>'"
Deactivates a popup page with specified pop-up page name on page with specified page. If page name is empty, the current page is used. If pop-up page is part of a group, the whole group is deactivated.

"'@PPK-<pop-up page name>'"
Kill a popup page with specified pop-up page name from ALL pages. If pop-up page is part of a group, the whole group is deactivated.

"'@PPA-<page_name>'"
Close all popups on a page.

"'@PPX'"
Closes all popups on all pages.

```
    "'@SWK-<string>'"
        Change Wakup string.

    "'@SSL-<string>'"
        Change Sleep string.

    "'@SST-<string>'"
        Change Startup string.

    "'@IDF'"
        Identify file. The panel returns a string with the DOS file name of the
        panel file like this:
        "'IDF-<dos file name>'"

    "'@IDP'"
        Identify project. The panel returns a string with the Project name of
        the panel file like this:
        "'IDP-<project name>'"

    "'@MOU' <touch_type>"
        Set the serial mouse type.
        Serial mouse types are as follows:
        Mouse Off               0
        MicroSoft Serial Mouse  1

-------------------------------------------------------------------------------
 all old style commands
-------------------------------------------------------------------------------

    "'CPAGE<color_number>-<page name>'"
        Sets the page with specified page name background color to the specified
        color.

    "'CFON<variable text address 1-255>-<color_number>'"
        Fill Color On.
        Sets the fill color for ON feedback to the specified color only if the
        specified fill on color is not the same as the current color.

    "'CFOFF<variable text address 1-255>-<color_number>'"
        Fill Color Off.
        Sets the fill color for OFF feedback to the specified color only if the
        specified fill off color is not the same as the current color.

    "'CBON<variable text address 1-255>-<color_number>'"
        Border Color On.
        Sets the border color for ON feedback to the specified color only if the
        specified border on color is not the same as the current color.

    "'CBOFF<variable text address 1-255>-<color_number>'"
        Border Color Off.
        Sets the border color for OFF feedback to the specified color only if
        the specified border off color is not the same as the current color.

    "'CTON<variable text address 1-255>-<color_number>'"
        Text Color On.
        Sets the text color for ON feedback to the specified color only if the
```

specified text on color is not the same as the current color.

"'CTOFF<variable text address 1-255>-<color_number>'"
Text Color Off.
Sets the text color for OFF feedback to the specified color only if the specified text off color is not the same as the current color.

"'CALL<variable text address 1-255>-<data>"
Sets All colors for button. The data is a series of 6 color_numbers in this order:

FILL COLOR ON
FILL COLOR OFF
BORDER COLOR ON
BORDER COLOR OFF
TEXT COLOR ON
TEXT COLOR OFF

Example:
"'CALL1-1 3 0 0 72 74'"
Sets Variable Text Button 1 to:

```
FILL COLOR ON    - RED one shade from brightest
FILL COLOR OFF   - RED three shades from brightest
BORDER COLOR ON  - RED brightest
BORDER COLOR OFF - RED brightest
TEXT COLOR ON    - WHITE brightest
TEXT COLOR OFF   - WHITE two shades from brightest
```

VARIABLE TEXT SEND_COMMANDS:

"'BTON<variable text address 1-255>'"
Turns specified button completely ON.

"'BTOF<variable text address 1-255>'"
Turns specified button OFF.

"'!B',<variable text address 1-255>,<ON/OFF 0-1>"
Turns Button On or Off.

"'!T',<variable text address 1-255>,'<new text to be put in button>'"
Shorthand and faster version of 'TEXT' command.
"'TEXT<variable text address 1-255>-<new text to be put in button>'"
Changes text in specified text button number.
A '|' character indicates a carriage return to begin next line down.
All text remains permanent even during power outage until changed with another TEXT command.
Example of usage:

"'TEXT2-VCR|PLAY'" changes text button number 2 to display:

```
------
| VCR  |
| PLAY |
------
```

"'!F',<variable text address 1-255>,'<font size 1-255>'"
Shorthand and faster version of 'FONT' command.
"'FONT<variable text address 1-255>-<font size 1-255>'"
Changes font size (or style) of the text in specified text button number.
Fixed Fonts are as follows:

```
            1 = x-small
            2 = small
            4 = large
            5 = x-large
            6 = hollow medium
            8 = hollow x-large
        Variable Fonts start at 32.

    "'!I',<variable text address 1-255>,'<border style 0-41>'"
        Shorthand and faster version of 'ICON' command.
    "'ICON<variable text address 1-255>-<border style 0-41>'"
        Changes border style of the specified text button number.
        Border styles are as follows:
        no_border             0
        no_border_special     1          3dim_rect_1           20
        single_line           2          3dim_rect_2           21
        double_line           3          3dim_round_1          22
        triple_line           4          3dim_round_2          23
        single_rounded        5          3dim_neon_1           24
        double_rounded        6          3dim_neon_2           25
        single_raised         7          3dim_neon_blue        26
        double_raised         8          3dim_neon_green       27
        triple_raised         9
        double_line_2_single  10         single_diamond        40
        double_line_3_single  11         double_diamond        41
        double_shadow         12

        Example of usage:
         "'ICON25-6'"
         Changes border style of text button number 25 to double rounded.

    "'!C',<variable text address 1-255>,<border style 0-41>,<font>,
          '<new text to be put in button>'"
        Combination command that will set border,font,and text in one
        shorthand command.
        NOTE: border style and font are single byte non-ascii data!!

--------------------------------------------------------------------------------
  MISC. SEND COMMANDS:

    "'PAGE-<page name>'"
        Flips to page with specified page name.
        Example of usage:
         "'PAGE-MAIN'" flips to a page named MAIN on the panel.

    "'PPON-<page name>'"
        Activates a popup page with specified page name.
        Example of usage:
         "'PPON-TRANS'" Activates popup page named TRANS on the panel.

    "'PPOF-<page name>'"
        Deactivates a popup page with specified page name.
        Example of usage:
         "'PPOF-TRANS'" Deactivates popup page named TRANS on the panel.

    "'SETUP'"
        Sends panel to SETUP page.
```

"'TPAGEON'"
    Turns on page tracking, whereby when the page changes, a string is sent to the Master in the format "'PAGE-<page name>'". This string may be captured with a CREATE_BUFFER command for one panel and sent directly to another panel because it is in the format of a "'PAGE-'" command.

   Example of usage:

```
DEFINE_VARIABLE
  TP1_BUF[25]
DEFINE_START
  CREATE_BUFFER TP1,TP1_BUF
DEFINE_PROGRAM
IF(LENGTH_STRING(TP1_BUF))  (* See if we got string from TP1 *)
{
  SEND_COMMAND TP2,TP1_BUF  (* Make TP2 page track TP1 *)
  TP1_BUF=''  (* Clear string buffer *)
}
```

"'TPAGEOFF'"
    Turns off page tracking.

"'AKEYB-<inital text>'"
     Pops up the keyboard icon and intializes the text string to that specified. Keyboard string is set to null on power up and is stored until power is lost.

"'AKEYP-<inital text>'"
    Pops up the keypad icon and intializes the text string to that specified. Keypad string is set to null on power up and is stored until power is lost.

"'AKEYR'"
    Remove keyboard or keypad that was displayed using "'AKEYB'", "'AKEYP'", or "'PKEYP'" commands.

"'PKEYP-<inital text>'"
    Private Keypad.
    Pops up the keypad icon and intializes the text string to that specified. Keypad displays a '*' instead of the numbers typed.

"'BEEP'"
    Outputs a beep.

"'ABEEP'"
    Outputs a beep duration 1 even if beep is off.

"'DBEEP'"
    Outputs a double beep.

"'ADBEEP'"
    Outputs a double beep even if beep is off.

"'QBEEP'"
    Stops ALL beeps, including "'ABEEP'", "'ADBEEP'", and AXlink beeps.

```
    "'WAKE'"
        Forces panel out of screen saver mode.

    "'SLEEP'"
        Forces panel into screen saver mode.

    "'CLOCK mm-dd-yy hh:mm:ss'"
        Sets the time and date on the panel.

        Example of usage:
         "'CLOCK 01-08-93 19:16:00'"
         Sets the time to 7:16 PM and date to January 8, 1993

    "'MOUSE'"
        Turn on MicroSoft Serial Mouse.

    "'RESET'"
        Clears all panel status (same as power up), NOT memory.

    "'ZAP!'"
        Clears all memory (erases all buttons, pages, icons, fonts, and
        bitmaps).


-------------------------------------------------------------------------------
-------------------------------------------------------------------------------
```

46 AXP-MLCD Mini LCD Panel

46.1 CHANNELS

CHANNEL	FUNCTION
1-255	Button Push and Feedback

46.2 COMMANDS

(SEND_COMMAND DEV,"command")

```
    'LIGHT<backlight level 0-9>' sets the backlight level to that
       specified where 0 is off and 9 is full brightness

       Example of usage:
         'LIGHT5' sets the backlight to a mid level brightness of 5

    'TIME<timeout in minutes 1-99>' sets the amount of time without
       a switch press before backlight times out and shuts off.  Default
       is 15 minutes

    'TIME' resets timeout as if a switch was pressed

    'LIGHT' causes an immediate timeout

    'BEEP<beep time in tenth seconds 0-9>' generates a beep of the
       specified time duration.  By sending another beep command before
       the previous one times out, the duration can be extended.  A
       'BEEP0' command will turn off the beeper immediately (added V2.21)

    >> Use the SEND_STRING instruction to send characters to LCD screen.
         Each character moves the imaginary cursor one position to the
         right where the following character will appear.  The following
         characters have special meaning:

         Char(decimal)  Desc       Result

              2         STX   Move the cursor to home (line one, column one)
              3         ETX   Move the cursor to end (last line, last
                                column)
              8         BS    Move cursor one position left
              9         HT    Move cursor one position right
              10        LF    Move cursor one position down. If the
                                current position is the bottom line
                                then the screen will scroll up one line
              12        FF    Clears the display and moves the cursor
                                to home (line one, column one)
              13        CR    Move cursor to first of line (column one)
              17        DC1   Move cursor to location specified by the
                                next two characters.  For example:
                                "17,1,2" will move cursor to line 1,
                                column 2
```

---

47 AXP-MSP8 8 Button Mini Softwire Panel

47.1 COMMANDS

(SEND_COMMAND DEV,"command")

```
    'BMODE<which bargraph 1-3><bargraph mode 0-9>'

        Sets the specified bargraph to operate in one of the following modes:

            0 = (default) normal bar mode
            1 = normal dot mode (only one peak LED on at a time)
            2 = special bar mode (a level of 1-15 still has first LED on)
            3 = special dot mode (a level of 1-15 still has first LED on)
            4 = inverse normal bar mode
            5 = inverse normal dot mode
            6 = inverse special bar mode
            7 = inverse special dot mode
            8 = individual element, discrete mode
            9 = inverse individual element, discrete mode

    'DIM<dim mode 0-7>'                          (v2.20)

        Sets the all LEDs (buttons and bargraph) to a one of the following
        dimmed states:

            0 = (default) 100% duty cycle  (brightest)
            1 = 50% duty cycle
            2 = 25% duty cycle
            3 = 12.5% duty cycle
            4 = 6.25% duty cycle
            5 = 4.5% duty cycle
            6 = 3% duty cycle
            7 = 1.5% duty cycle            (dimmest)

-------------------------------------------------------------------------------
```

48 AXU-MSP16/24/32 Mini Softwire Panels

48.1 COMMANDS

(SEND_COMMAND DEV,"command")

```
    'BMODE<which bargraph 1-3><bargraph mode 0-8> sets the specified
       bargraph to operate in one of the following modes:

            0 = (default) normal bar mode
            1 = normal dot mode (only one peak LED on at a time)
            2 = special bar mode (a level of 1-15 still has first LED on)
            3 = special dot mode (a level of 1-15 still has first LED on)
            4 = inverse normal bar mode
            5 = inverse normal dot mode
            6 = inverse special bar mode
            7 = inverse special dot mode
            8 = individaul element, discrete mode
            9 = inverse individual element, discrete mode

    'DIM<dim mode 0-7>'                          (v2.20)

        Sets the all LEDs (buttons and bargraph) to a one of the following
        dimmed states:

            0 = (default) 100% duty cycle  (brightest)
            1 = 50% duty cycle
            2 = 25% duty cycle
            3 = 12.5% duty cycle
            4 = 6.25% duty cycle
            5 = 4.5% duty cycle
            6 = 3% duty cycle
            7 = 1.5% duty cycle            (dimmest)

-------------------------------------------------------------------------------
```

49 AXU-MLC Mini LCD Touch Panel (320x240)

50 AXT-MLC Tilt Mini LCD Touch Panel (320x240)

50.1 COMMANDS

(SEND_COMMAND DEV,"command")

```
COLOR SEND_COMMANDS:

   Color Numbers:
    WHITE       :72-77
    BLACK       :87
    TRANSPARENT :255

------------------------------------------------------------------------------
 New command format starts with @
 Most commands are in what is known as "shorthand" format
 where the data is always one-byte non-ascii data except
 for pages, passwords, text and bitmap names.
------------------------------------------------------------------------------

    "'@CPG',<color_number>,'<page name>'"
        Sets the page with specified page name background color to the specified
        color only if the specified background color is not the same as the
        current color.

    "'@CPP',<color_number>,'<pop-up page name>'"
        Sets the page with specified pop-up page name background color to the
        specified color only if the specified background color is not the same
        as the current color.

    "'@CFN',<variable text address 1-255>,<color_number>"
        Fill Color On.
        Sets the fill color for ON feedback to the specified color only if the
        specified fill on color is not the same as the current color.

    "'@CFF',<variable text address 1-255>,<color_number>"
        Fill Color Off.
        Sets the fill color for OFF feedback to the specified color only if the
        specified fill off color is not the same as the current color.

    "'@CBN',<variable text address 1-255>,<color_number>"
        Border Color On.
        Sets the border color for ON feedback to the specified color only if the
        specified border on color is not the same as the current color.

    "'@CBF',<variable text address 1-255>,<color_number>"
        Border Color Off.
        Sets the border color for OFF feedback to the specified color only if
        the specified border off color is not the same as the current color.

    "'@CTN',<variable text address 1-255>,<color_number>"
        Text Color On.
```

Sets the text color for ON feedback to the specified color only if the specified text on color is not the same as the current color.

"'@CTF',<variable text address 1-255>,<color_number>"
Text Color Off.
Sets the text color for OFF feedback to the specified color only if the specified text off color is not the same as the current color.

VARIABLE TEXT SEND_COMMANDS:

NOTE:DATA FOR ALL COMMANDS EXCEPT TEXT AND BITMAP
ARE SINGLE BYTE NON-ASCII DATA!!

"'@BMF',<variable text address 1-255>,'<data>'"

Set any/all button parameters by sending embedded codes and data.
Codes are:

'%B',<border 1-27,40,41>	Set Border
'%F',<font 1-8,32-xx>	Set Font
'%T',<text>	Set Text (empty is clear)
'%P',<bitmap>	Set Picture/Bitmap (empty is clear)
'%I',<icon 1-255, 0-clear>	Set Icon
'%J',<alignment of text 1-9>	Set text alignment using telephone Keypad layout (1 = left,top 5 = center,middle 9 = right,bottom)
'%C1',<on fill color>	Set On Fill Color
'%C2',<off fill color>	Set Off Fill Color
'%C3',<on border color>	Set On Border Color
'%C4',<off border color>	Set Off Border Color
'%C5',<on text color>	Set On Text Color
'%C6',<off text color>	Set Off Text Color

"'@SHO',<variable text address 1-255>,<ON/OFF 1-0>"
Turns Button On or Off (show/hide).

"'@ENA',<variable text address 1-255>,<ON/OFF 0-1>"
Enables Button On or Off (enable/disable).

"'@ICO',<variable text address 1-255>,<icon index 0-255>"
Set Icon, 0 is clear.

"'@BMP',<variable text address 1-255>,'<name of bitmap>'"
Set Bitmap.

"'@TXT',<variable text address 1-255>,'<new text to be put in button>'"
Set Text.

"'@UNI',<variable text address 1-255>,'<new text to be put in button>'"
Set Unicode Text.

"'@JUS',<variable text address 1-255>,<new text alignment>"
Set Text Alignment, use numeric keypad layout.
(7 = Left Bottom, 3= Right Top).

"'@FON',<variable text address 1-255>,<font size 1-255>"
Set Font.
Fixed Fonts are as follows:
1 = x-small
2 = small
4 = large
5 = x-large
6 = hollow medium
8 = hollow x-large
Variable Fonts start at 32.

"'@BOR',<variable text address 1-255>,<border style 0-41>"
Set Border only if the specified border is not the same as the current border.
Border styles are as follows:

no_border	0		
no_border_special	1	3dim_rect_1	20
single_line	2	3dim_rect_2	21
double_line	3	3dim_round_1	22
triple_line	4	3dim_round_2	23
single_rounded	5	3dim_neon_1	24
double_rounded	6	3dim_neon_2	25
single_raised	7	3dim_neon_blue	26
double_raised	8	3dim_neon_green	27
triple_raised	9		
double_line_2_single	10	single_diamond	40
double_line_3_single	11	double_diamond	41
double_shadow	12		

MISC. SEND COMMANDS:

"'@PWD-<page flip password>'"
Set page flip password

"'@PRO-<protected setup password>'"
Set protected setup password

"'@PPN-<pop-up page name>;<page name>'"
Activates a popup page with specified pop-up page name on page with specified specified page. If page name is empty, the current page is used.

"'@PPF-<pop-up page name>;<page name>'"
Deactivates a popup page with specified pop-up page name on page with specified page. If page name is empty, the current page is used. If pop-up page is part of a group, the whole group is deactivated.

"'@PPK-<pop-up page name>'"
Kill a popup page with specified pop-up page name from ALL pages. If pop-up page is part of a group, the whole group is deactivated.

"'@PPA-<page_name>'"
Close all popups on a page.

"'@PPX'"

Closes all popups on all pages.

"'@SWK-<string>'"
Change Wakup string.

"'@SSL-<string>'"
Change Sleep string.

"'@SST-<string>'"
Change Startup string.

"'@IDF'"
Identify file. The panel returns a string with the DOS file name of the panel file like this:
"'IDF-<dos file name>'"

"'@IDP'"
Identify project. The panel returns a string with the Project name of the panel file like this:
"'IDP-<project name>'"

"'@MOU' <touch_type>"
Set the serial mouse type.
Serial mouse types are as follows:
Mouse Off 0
MicroSoft Serial Mouse 1

---

all old style commands

"'CPAGE<color_number>-<page name>'"
Sets the page with specified page name background color to the specified color.

"'CFON<variable text address 1-255>-<color_number>'"
Fill Color On.
Sets the fill color for ON feedback to the specified color only if the specified fill on color is not the same as the current color.

"'CFOFF<variable text address 1-255>-<color_number>'"
Fill Color Off.
Sets the fill color for OFF feedback to the specified color only if the specified fill off color is not the same as the current color.

"'CBON<variable text address 1-255>-<color_number>'"
Border Color On.
Sets the border color for ON feedback to the specified color only if the specified border on color is not the same as the current color.

"'CBOFF<variable text address 1-255>-<color_number>'"
Border Color Off.
Sets the border color for OFF feedback to the specified color only if the specified border off color is not the same as the current color.

"'CTON<variable text address 1-255>-<color_number>'"
Text Color On.

Sets the text color for ON feedback to the specified color only if the specified text on color is not the same as the current color.

"'CTOFF<variable text address 1-255>-<color_number>'"
Text Color Off.
Sets the text color for OFF feedback to the specified color only if the specified text off color is not the same as the current color.

"'CALL<variable text address 1-255>-<data>"
Sets All colors for button. The data is a series of 6 color_numbers in this order:

FILL COLOR ON
FILL COLOR OFF
BORDER COLOR ON
BORDER COLOR OFF
TEXT COLOR ON
TEXT COLOR OFF

Example:
"'CALL1-1 3 0 0 72 74'"
Sets Variable Text Button 1 to:

```
FILL COLOR ON    - RED one shade from brightest
FILL COLOR OFF   - RED three shades from brightest
BORDER COLOR ON  - RED brightest
BORDER COLOR OFF - RED brightest
TEXT COLOR ON    - WHITE brightest
TEXT COLOR OFF   - WHITE two shades from brightest
```

VARIABLE TEXT SEND_COMMANDS:

"'BTON<variable text address 1-255>'"
Turns specified button completely ON.

"'BTOF<variable text address 1-255>'"
Turns specified button OFF.

"'!B',<variable text address 1-255>,<ON/OFF 0-1>"
Turns Button On or Off.

"'!T',<variable text address 1-255>,'<new text to be put in button>'"
Shorthand and faster version of 'TEXT' command.
"'TEXT<variable text address 1-255>-<new text to be put in button>'"
Changes text in specified text button number.
A '|' character indicates a carriage return to begin next line down.
All text remains permanent even during power outage until changed with another TEXT command.
Example of usage:

"'TEXT2-VCR|PLAY'" changes text button number 2 to display:

```
------
| VCR  |
| PLAY |
------
```

"'!F',<variable text address 1-255>,'<font size 1-255>'"
Shorthand and faster version of 'FONT' command.
"'FONT<variable text address 1-255>-<font size 1-255>'"
Changes font size (or style) of the text in specified text button number.

```
        Fixed Fonts are as follows:
            1 = x-small
            2 = small
            4 = large
            5 = x-large
            6 = hollow medium
            8 = hollow x-large
        Variable Fonts start at 32.

    "'!I',<variable text address 1-255>,'<border style 0-41>'"
        Shorthand and faster version of 'ICON' command.
    "'ICON<variable text address 1-255>-<border style 0-41>'"
        Changes border style of the specified text button number.
        Border styles are as follows:
        no_border             0
        no_border_special     1          3dim_rect_1           20
        single_line           2          3dim_rect_2           21
        double_line           3          3dim_round_1          22
        triple_line           4          3dim_round_2          23
        single_rounded        5          3dim_neon_1           24
        double_rounded        6          3dim_neon_2           25
        single_raised         7          3dim_neon_blue        26
        double_raised         8          3dim_neon_green       27
        triple_raised         9
        double_line_2_single  10         single_diamond        40
        double_line_3_single  11         double_diamond        41
        double_shadow         12

        Example of usage:
         "'ICON25-6'"
         Changes border style of text button number 25 to double rounded.

    "'!C',<variable text address 1-255>,<border style 0-41>,<font>,
          '<new text to be put in button>'"
        Combination command that will set border,font,and text in one
        shorthand command.
        NOTE: border style and font are single byte non-ascii data!!

--------------------------------------------------------------------------
  MISC. SEND COMMANDS:

    "'PAGE-<page name>'"
        Flips to page with specified page name.
        Example of usage:
         "'PAGE-MAIN'" flips to a page named MAIN on the panel.

    "'PPON-<page name>'"
        Activates a popup page with specified page name.
        Example of usage:
         "'PPON-TRANS'" Activates popup page named TRANS on the panel.

    "'PPOF-<page name>'"
        Deactivates a popup page with specified page name.
        Example of usage:
         "'PPOF-TRANS'" Deactivates popup page named TRANS on the panel.

    "'SETUP'"
```

```
    Sends panel to SETUP page.

"'TPAGEON'"
    Turns on page tracking, whereby when the page changes, a string is sent
    to the Master in the format "'PAGE-<page name>'". This string may be
    captured with a CREATE_BUFFER command for one panel and sent directly to
    another panel because it is in the format of a "'PAGE-'" command.

   Example of usage:
     DEFINE_VARIABLE
       TP1_BUF[25]
     DEFINE_START
       CREATE_BUFFER TP1,TP1_BUF
     DEFINE_PROGRAM
     IF(LENGTH_STRING(TP1_BUF))  (* See if we got string from TP1 *)
       {
       SEND_COMMAND TP2,TP1_BUF  (* Make TP2 page track TP1 *)
       TP1_BUF=''  (* Clear string buffer *)
       }

"'TPAGEOFF'"
    Turns off page tracking.

"'AKEYB-<inital text>'"
     Pops up the keyboard icon and intializes the text string to that
     specified. Keyboard string is set to null on power up and is stored
     until power is lost.

"'AKEYP-<inital text>'"
    Pops up the keypad icon and intializes the text string to that
    specified. Keypad string is set to null on power up and is stored until
    power is lost.

"'AKEYR'"
    Remove keyboard or keypad that was displayed using "'AKEYB'", "'AKEYP'",
    or "'PKEYP'" commands.

"'PKEYP-<inital text>'"
    Private Keypad.
    Pops up the keypad icon and intializes the text string to that
    specified. Keypad displays a '*' instead of the numbers typed.

"'BEEP'"
    Outputs a beep.

"'ABEEP'"
    Outputs a beep duration 1 even if beep is off.

"'DBEEP'"
    Outputs a double beep.

"'ADBEEP'"
    Outputs a double beep even if beep is off.

"'QBEEP'"
    Stops ALL beeps, including "'ABEEP'", "'ADBEEP'", and AXlink beeps.
```

```
    "'WAKE'"
        Forces panel out of screen saver mode.

    "'SLEEP'"
        Forces panel into screen saver mode.

    "'BRIT-<bright level>'"
        Sets the brightness level between 1 and 8.

    "'CONT-<contrast level>'"
        Sets the contrast level between 1 and 12.

    "'CLOCK mm-dd-yy hh:mm:ss'"
        Sets the time and date on the panel.

        Example of usage:
         "'CLOCK 01-08-93 19:16:00'"
         Sets the time to 7:16 PM and date to January 8, 1993

    "'MOUSE'"
        Turn on MicroSoft Serial Mouse.

    "'RESET'"
        Clears all panel status (same as power up), NOT memory.

    "'ZAP!'"
        Clears all memory (erases all buttons, pages, icons, fonts, and
        bitmaps).


-------------------------------------------------------------------------
  SPECIAL ON PANEL STRING COMMANDS:
    '$ST t' - Set screen timeout in t minutes 1-120.
    '$ID d' - Set Group Id of WavePack.
    '$SL'   - Put Panel to Sleep

-------------------------------------------------------------------------
  WAVE SEND COMMANDS:

    '#ST t' Sets the power down sleep time to t minutes (1-120 or 0 for OFF).
            Also resets sleep timer.

-------------------------------------------------------------------------
  Special Button Strings:

  WAVE GROUP ID:        Assign a standard string to a button that is formatted
                        as follows:   $ID n    where n is Group ID (0-15).

  WAVE SLEEP TIME:      Assign a standard string to a button that is formatted
                        as follows:   $ST t    where t is Sleep Time in
                                               minutes (1-120 or 0 for OFF).

-------------------------------------------------------------------------
-------------------------------------------------------------------------
```

51 AXP-SP+ Softwire Panel

51.1 COMMANDS

(SEND_COMMAND DEV,”command”)

```
    'BMODE<which bargraph 1-3><bargraph mode 0-8> sets the specified
       bargraph to operate in one of the following modes:

            0 = (default) normal bar mode
            1 = normal dot mode (only one peak LED on at a time)
            2 = special bar mode (level 0 still has first LED on)
            3 = special dot mode (level 0 still has first LED on)
            4 = inverse normal bar mode
            5 = inverse normal dot mode
            6 = inverse special bar mode
            7 = inverse special dot mode
            8 = individaul element, discrete mode

-------------------------------------------------------------------------------
```

52 AXP-SP Softwire Panel

52.1 COMMANDS

(SEND_COMMAND DEV,”command”)

```
    'BMODE<which bargraph 1-3><bargraph mode 0-8> sets the specified
       bargraph to operate in one of the following modes:

            0 = (default) normal bar mode
            1 = normal dot mode (only one peak LED on at a time)
            2 = special bar mode (level 0 still has first LED on)
            3 = special dot mode (level 0 still has first LED on)
            4 = inverse normal bar mode
            5 = inverse normal dot mode
            6 = inverse special bar mode
            7 = inverse special dot mode
            8 = individaul element, discrete mode

--------------------------------------------------------------------------------
```

53 AXP-EL+/TS EL Tilt Touch Panels (640x400)

53.1 COMMANDS

(SEND_COMMAND DEV,"command")

```
-------------------
 New command format starts with @
 Most commands are in what is known as "shorthand" format
 where the data is always one-byte non-ascii data except
 for pages, passwords, text and bitmap names.
-------------------------------------------------------------------------

    "'@CPG',<color_number>,'<page name>'"
        Sets the page with specified page name background color to the specified
        color only if the specified background color is not the same as the
        current color.

    "'@CPP',<color_number>,'<pop-up page name>'"
        Sets the page with specified pop-up page name background color to the
        specified color only if the specified background color is not the same
        as the current color.

    "'@CFN',<variable text address 1-255>,<color_number>"
        Fill Color On.
        Sets the fill color for ON feedback to the specified color only if the
        specified fill on color is not the same as the current color.

    "'@CFF',<variable text address 1-255>,<color_number>"
        Fill Color Off.
        Sets the fill color for OFF feedback to the specified color only if the
        specified fill off color is not the same as the current color.

    "'@CBN',<variable text address 1-255>,<color_number>"
        Border Color On.
        Sets the border color for ON feedback to the specified color only if the
        specified border on color is not the same as the current color.

    "'@CBF',<variable text address 1-255>,<color_number>"
        Border Color Off.
        Sets the border color for OFF feedback to the specified color only if
        the specified border off color is not the same as the current color.

    "'@CTN',<variable text address 1-255>,<color_number>"
        Text Color On.
        Sets the text color for ON feedback to the specified color only if the
        specified text on color is not the same as the current color.

    "'@CTF',<variable text address 1-255>,<color_number>"
        Text Color Off.
        Sets the text color for OFF feedback to the specified color only if the
        specified text off color is not the same as the current color.


-------------------------------------------------------------------------
  VARIABLE TEXT SEND_COMMANDS:
```

NOTE:DATA FOR ALL COMMANDS EXCEPT TEXT AND BITMAP
ARE SINGLE BYTE NON-ASCII DATA!!

"'@BMF',<variable text address 1-255>,'<data>'"

Set any/all button parameters by sending embedded codes and data.
Codes are:

'%B',<border 1-27,40,41>	Set Border
'%F',<font 1-8,32-xx>	Set Font
'%T',<text>	Set Text (empty is clear)
'%P',<bitmap>	Set Picture/Bitmap (empty is clear)
'%I',<icon 1-255, 0-clear>	Set Icon
'%J',<alignment of text 1-9>	Set text alignment using telephone Keypad layout (1 = left,top 5 = center,middle 9 = right,bottom)
'%C1',<on fill color>	Set On Fill Color
'%C2',<off fill color>	Set Off Fill Color
'%C3',<on border color>	Set On Border Color
'%C4',<off border color>	Set Off Border Color
'%C5',<on text color>	Set On Text Color
'%C6',<off text color>	Set Off Text Color

"'@SHO',<variable text address 1-255>,<ON/OFF 1-0>"
Turns Button On or Off (show/hide).

"'@ENA',<variable text address 1-255>,<ON/OFF 0-1>"
Enables Button On or Off (enable/disable).

"'@ICO',<variable text address 1-255>,<icon index 0-255>"
Set Icon, 0 is clear.

"'@BMP',<variable text address 1-255>,'<name of bitmap>'"
Set Bitmap.

"'@TXT',<variable text address 1-255>,'<new text to be put in button>'"
Set Text.

"'@UNI',<variable text address 1-255>,'<new text to be put in button>'"
Set Unicode Text.

"'@JUS',<variable text address 1-255>,<new text alignment>"
Set Text Alignment, use numeric keypad layout.
(7 = Left Bottom, 3= Right Top).

"'@FON',<variable text address 1-255>,<font size 1-255>"
Set Font.
Fixed Fonts are as follows:
1 = x-small
2 = small
4 = large
5 = x-large
6 = hollow medium
8 = hollow x-large
Variable Fonts start at 32.

"'@BOR',<variable text address 1-255>,<border style 0-41>"
Set Border only if the specified border is not the same as the current border.
Border styles are as follows:

no_border	0		
no_border_special	1	3dim_rect_1	20
single_line	2	3dim_rect_2	21
double_line	3	3dim_round_1	22
triple_line	4	3dim_round_2	23
single_rounded	5	3dim_neon_1	24
double_rounded	6	3dim_neon_2	25
single_raised	7	3dim_neon_blue	26
double_raised	8	3dim_neon_green	27
triple_raised	9		
double_line_2_single	10	single_diamond	40
double_line_3_single	11	double_diamond	41
double_shadow	12		

MISC. SEND COMMANDS:

"'@PWD-<page flip password>'"
Set page flip password

"'@PRO-<protected setup password>'"
Set protected setup password

"'@PPN-<pop-up page name>;<page name>'"
Activates a popup page with specified pop-up page name on page with specified specified page. If page name is empty, the current page is used.

"'@PPF-<pop-up page name>;<page name>'"
Deactivates a popup page with specified pop-up page name on page with specified page. If page name is empty, the current page is used. If pop-up page is part of a group, the whole group is deactivated.

"'@PPK-<pop-up page name>'"
Kill a popup page with specified pop-up page name from ALL pages. If pop-up page is part of a group, the whole group is deactivated.

"'@PPA-<page_name>'"
Close all popups on a page.

"'@PPX'"
Closes all popups on all pages.

"'@SWK-<string>'"
Change Wakup string.

"'@SSL-<string>'"
Change Sleep string.

"'@SST-<string>'"
Change Startup string.

"'@IDF'"
Identify file. The panel returns a string with the DOS file name of the panel file like this:
"'IDF-<dos file name>'"

"'@IDP'"
Identify project. The panel returns a string with the Project name of the panel file like this:
"'IDP-<project name>'"

"'@MOU' <touch_type>"
Set the serial mouse type.
Serial mouse types are as follows:
Mouse Off 0
MicroSoft Serial Mouse 1

---

all old style commands

"'CPAGE<color_number>-<page name>'"
Sets the page with specified page name background color to the specified color.

"'CFON<variable text address 1-255>-<color_number>'"
Fill Color On.
Sets the fill color for ON feedback to the specified color only if the specified fill on color is not the same as the current color.

"'CFOFF<variable text address 1-255>-<color_number>'"
Fill Color Off.
Sets the fill color for OFF feedback to the specified color only if the specified fill off color is not the same as the current color.

"'CBON<variable text address 1-255>-<color_number>'"
Border Color On.
Sets the border color for ON feedback to the specified color only if the specified border on color is not the same as the current color.

"'CBOFF<variable text address 1-255>-<color_number>'"
Border Color Off.
Sets the border color for OFF feedback to the specified color only if the specified border off color is not the same as the current color.

"'CTON<variable text address 1-255>-<color_number>'"
Text Color On.
Sets the text color for ON feedback to the specified color only if the specified text on color is not the same as the current color.

"'CTOFF<variable text address 1-255>-<color_number>'"
Text Color Off.
Sets the text color for OFF feedback to the specified color only if the specified text off color is not the same as the current color.

"'CALL<variable text address 1-255>-<data>"
Sets All colors for button. The data is a series of 6 color_numbers in this order:

```
                        FILL COLOR ON
                        FILL COLOR OFF
                        BORDER COLOR ON
                        BORDER COLOR OFF
                        TEXT COLOR ON
                        TEXT COLOR OFF
        Example:
            "'CALL1-1 3 0 0 72 74'"
            Sets Variable Text Button 1 to:
                        FILL COLOR ON    - RED one shade from brightest
                        FILL COLOR OFF   - RED three shades from brightest
                        BORDER COLOR ON  - RED brightest
                        BORDER COLOR OFF - RED brightest
                        TEXT COLOR ON    - WHITE brightest
                        TEXT COLOR OFF   - WHITE two shades from brightest


-------------------------------------------------------------------------
  VARIABLE TEXT SEND_COMMANDS:

    "'BTON<variable text address 1-255>'"
        Turns specified button completely ON.

    "'BTOF<variable text address 1-255>'"
        Turns specified button OFF.

    "'!B',<variable text address 1-255>,<ON/OFF 0-1>"
        Turns Button On or Off.

    "'!T',<variable text address 1-255>,'<new text to be put in button>'"
        Shorthand and faster version of 'TEXT' command.
    "'TEXT<variable text address 1-255>-<new text to be put in button>'"
        Changes text in specified text button number.
        A '|' character indicates a carriage return to begin next line down.
        All text remains permanent even during power outage until changed with
        another TEXT command.
        Example of usage:                                          ------
                                                                  | VCR  |
        "'TEXT2-VCR|PLAY'" changes text button number 2 to display: | PLAY |
                                                                   ------
    "'!F',<variable text address 1-255>,'<font size 1-255>'"
        Shorthand and faster version of 'FONT' command.
    "'FONT<variable text address 1-255>-<font size 1-255>'"
        Changes font size (or style) of the text in specified text button
        number.
        Fixed Fonts are as follows:
            1 = x-small
            2 = small
            4 = large
            5 = x-large
            6 = hollow medium
            8 = hollow x-large
        Variable Fonts start at 32.

    "'!I',<variable text address 1-255>,'<border style 0-41>'"
        Shorthand and faster version of 'ICON' command.
```

"'ICON<variable text address 1-255>-<border style 0-41>'"
Changes border style of the specified text button number.
Border styles are as follows:

no_border	0		
no_border_special	1	3dim_rect_1	20
single_line	2	3dim_rect_2	21
double_line	3	3dim_round_1	22
triple_line	4	3dim_round_2	23
single_rounded	5	3dim_neon_1	24
double_rounded	6	3dim_neon_2	25
single_raised	7	3dim_neon_blue	26
double_raised	8	3dim_neon_green	27
triple_raised	9		
double_line_2_single	10	single_diamond	40
double_line_3_single	11	double_diamond	41
double_shadow	12		

Example of usage:
"'ICON25-6'"
Changes border style of text button number 25 to double rounded.

"'!C',<variable text address 1-255>,<border style 0-41>,<font>,
'<new text to be put in button>'"
Combination command that will set border,font,and text in one
shorthand command.
NOTE: border style and font are single byte non-ascii data!!

MISC. SEND COMMANDS:

"'PAGE-<page name>'"
Flips to page with specified page name.
Example of usage:
"'PAGE-MAIN'" flips to a page named MAIN on the panel.

"'PPON-<page name>'"
Activates a popup page with specified page name.
Example of usage:
"'PPON-TRANS'" Activates popup page named TRANS on the panel.

"'PPOF-<page name>'"
Deactivates a popup page with specified page name.
Example of usage:
"'PPOF-TRANS'" Deactivates popup page named TRANS on the panel.

"'SETUP'"
Sends panel to SETUP page.

"'TPAGEON'"
Turns on page tracking, whereby when the page changes, a string is sent
to the Master in the format "'PAGE-<page name>'". This string may be
captured with a CREATE_BUFFER command for one panel and sent directly to
another panel because it is in the format of a "'PAGE-'" command.

Example of usage:

```
DEFINE_VARIABLE
  TP1_BUF[25]
```

```
     DEFINE_START
       CREATE_BUFFER TP1,TP1_BUF
     DEFINE_PROGRAM
     IF(LENGTH_STRING(TP1_BUF))  (* See if we got string from TP1 *)
       {
       SEND_COMMAND TP2,TP1_BUF  (* Make TP2 page track TP1 *)
       TP1_BUF=''  (* Clear string buffer *)
       }
```

"'TPAGEOFF'"
Turns off page tracking.

"'AKEYB-<inital text>'"
Pops up the keyboard icon and intializes the text string to that specified. Keyboard string is set to null on power up and is stored until power is lost.

"'AKEYP-<inital text>'"
Pops up the keypad icon and intializes the text string to that specified. Keypad string is set to null on power up and is stored until power is lost.

"'AKEYR'"
Remove keyboard or keypad that was displayed using "'AKEYB'", "'AKEYP'", or "'PKEYP'" commands.

"'PKEYP-<inital text>'"
Private Keypad.
Pops up the keypad icon and intializes the text string to that specified. Keypad displays a '*' instead of the numbers typed.

"'BEEP'"
Outputs a beep.

"'ABEEP'"
Outputs a beep duration 1 even if beep is off.

"'DBEEP'"
Outputs a double beep.

"'ADBEEP'"
Outputs a double beep even if beep is off.

"'QBEEP'"
Stops ALL beeps, including "'ABEEP'", "'ADBEEP'", and AXlink beeps.

"'WAKE'"
Forces panel out of screen saver mode.

"'SLEEP'"
Forces panel into screen saver mode.

"'CLOCK mm-dd-yy hh:mm:ss'"
Sets the time and date on the panel.

Example of usage:

```
        "'CLOCK 01-08-93 19:16:00'"
        Sets the time to 7:16 PM and date to January 8, 1993

    "'MOUSE'"
        Turn on MicroSoft Serial Mouse.

    "'RESET'"
        Clears all panel status (same as power up), NOT memory.

    "'ZAP!'"
        Clears all memory (erases all buttons, pages, icons, fonts, and
        bitmaps).


-------------------------------------------------------------------------
-------------------------------------------------------------------------
```

54 AXP-LC LCD Touch Panel (640x480)

54.1 COMMANDS

(SEND_COMMAND DEV,"command")

```
'RESET' clears all panel status (same as power up), NOT memory
'SETUP' sends panel to SETUP page

'PAGE-<page name>' flips to page with specified page name
   Example of usage:
     'PAGE-MAIN' flips to a page named MAIN on the panel

'TPAGEON' turns on page tracking, whereby when the page changes,
   a string is sent to the Master in the format 'PAGE-<page name>'.
   This string may be captured with a CREATE_BUFFER command for
   one panel and sent directly to another panel because it is in
   the format of a 'PAGE-' command  (added V2.20)

   Example of usage:
     DEFINE_VARIABLE
       TP1_BUF[25]
     DEFINE_START
       CREATE_BUFFER TP1,TP1_BUF
     DEFINE_PROGRAM
     IF(LENGTH_STRING(TP1_BUF))  (* See if we got string from TP1 *)
       {
       SEND_COMMAND TP2,TP1_BUF  (* Make TP2 page track TP1 *)
       TP1_BUF=''  (* Clear string buffer *)
       }

'TPAGEOFF' turns off page tracking  (added V2.20)
'BEEP' outputs a beep
'ABEEP' outputs a beep duration 1 even if beep is off
'DBEEP' outputs a double beep
'ADBEEP' outputs a double beep even if beep is off
'WAKE' forces EL out of screen saver mode and resets EL timer
'SLEEP' forces EL into screen saver mode

"'!T',<variable text address 1-255>,'<new text to be put in button>'"
   shorthand and faster version of 'TEXT' command
'TEXT<variable text address 1-255>-<new text to be put in button>'
   changes text in specified text button number.  All text is
   centered in the box.  A '|' character indicates a carriage
   return to begin next line down.  All text remains permanent
   even during power outage until changed with another TEXT
   command or the panel editor
   Example of usage:                                          ------
                                                             | VCR  |
    'TEXT2-VCR|PLAY' changes text button number 2 to display: | PLAY |
                                                              ------

"'!F',<variable text address 1-255>,'<font size 1-30>'"
   shorthand and faster version of 'FONT' command
'FONT<variable text address 1-255>-<font size 1-30>'
   changes font size (or style) of the text in
   specified text button number.  Fonts are as follows:
```

```
        1 = x-small           7 = hollow large
        2 = small             8 = hollow x-large
        3 = medium            9 = shadow x-large
        4 = large            20 = fixed symbols
        5 = x-large          21 = user defined symbols
        6 = hollow medium    30 = logo drawings

"'!I',<variable text address 1-255>,'<border style 0-14>'"
   shorthand and faster version of 'ICON' command
'ICON<variable text address 1-255>-<border style 0-14>'
   Changes border style of the specified text button number.
   Border styles are as follows:
        0 = no border         7 = double single single
        1 = single wide       8 = single diamond
        2 = double wide       9 = double diamond
        3 = single raised    10 = triple wide
        4 = double raised    11 = double single single single
        5 = single rounded   12 = triple raised
        6 = double rounded   13 = shadow
                             14 = no border, no background  (V2.21)
   Example of usage:
     'ICON25-6' changes border style of text button number 25 to
        double rounded

"'!C',<variable text address 1-255>,<borber style 0-14>,<font>,
      '<new text to be put in button>'"
  Combination command that will set border,font,and text in one
  shorthand command.
  NOTE::borber style and font are single byte non-ascii data!!

'KEYB-<inital text>' intializes the text string for the next time a
  keyboard icon appears (does not pop up keyboard).  This command
  will not update an already displayed keyboard.  Keyboard string
  is set to null on power up and is stored until power is lost.
  Using the 'AKEYB-' command is recommended instead of this one.

'KEYP-<inital text>' intializes the text string for the next time a
  keypad icon appears (does not pop up keypad).  This command
  will not update an already displayed keypad.  Keypad string
  is set to null on power up and is stored until power is lost.
  Using the 'AKEYP-' command is recommended instead of this one.

'AKEYB-<inital text>' pops up the keyboard icon and intializes the
  text string to that specified.  Keyboard string is set to null on
  power up and is stored until power is lost.  (Added V2.44)

'AKEYP-<inital text>' pops up the keypad icon and intializes the
  text string to that specified.  Keypad string is set to null on
  power up and is stored until power is lost.  (Added V2.44)

'AKEYR' remove keyboard or keypad that was displayed using 'AKEYB'
  or 'AKEYP' commands.  (Added v2.54)

'CLOCK mm-dd-yy hh:mm:ss' sets the time and date on the panel

   Example of usage:
     'CLOCK 01-08-93 19:16:00' sets the time to 7:16 PM and date
```

to January 8, 1993

'ZAP!' clears all memory (erases all buttons, pages, and drawings)

>> Use the SEND_STRING instruction to send characters to the 16 and 32 character terminal windows

---

55 AXP-TLC/AXU-LC LCD Touch Panels (640x480)

55.1 COMMANDS

(SEND_COMMAND DEV,"command")

```
------------------
  COLOR SEND_COMMANDS:

   Color Numbers:
    WHITE       :72-77
    BLACK       :87
    TRANSPARENT :255

-------------------------------------------------------------------------------
 New command format starts with @
 Most commands are in what is known as "shorthand" format
 where the data is always one-byte non-ascii data except
 for pages, passwords, text and bitmap names.
-------------------------------------------------------------------------------

    "'@CPG',<color_number>,'<page name>'"
        Sets the page with specified page name background color to the specified
        color only if the specified background color is not the same as the
        current color.

    "'@CPP',<color_number>,'<pop-up page name>'"
        Sets the page with specified pop-up page name background color to the
        specified color only if the specified background color is not the same
        as the current color.

    "'@CFN',<variable text address 1-255>,<color_number>"
        Fill Color On.
        Sets the fill color for ON feedback to the specified color only if the
        specified fill on color is not the same as the current color.

    "'@CFF',<variable text address 1-255>,<color_number>"
        Fill Color Off.
        Sets the fill color for OFF feedback to the specified color only if the
        specified fill off color is not the same as the current color.

    "'@CBN',<variable text address 1-255>,<color_number>"
        Border Color On.
        Sets the border color for ON feedback to the specified color only if the
        specified border on color is not the same as the current color.

    "'@CBF',<variable text address 1-255>,<color_number>"
        Border Color Off.
        Sets the border color for OFF feedback to the specified color only if
        the specified border off color is not the same as the current color.

    "'@CTN',<variable text address 1-255>,<color_number>"
        Text Color On.
        Sets the text color for ON feedback to the specified color only if the
        specified text on color is not the same as the current color.
```

"'@CTF',<variable text address 1-255>,<color_number>"
Text Color Off.
Sets the text color for OFF feedback to the specified color only if the specified text off color is not the same as the current color.

VARIABLE TEXT SEND_COMMANDS:

NOTE:DATA FOR ALL COMMANDS EXCEPT TEXT AND BITMAP
ARE SINGLE BYTE NON-ASCII DATA!!

"'@BMF',<variable text address 1-255>,'<data>'"

Set any/all button parameters by sending embedded codes and data.
Codes are:

'%B',<border 1-27,40,41>	Set Border
'%F',<font 1-8,32-xx>	Set Font
'%T',<text>	Set Text (empty is clear)
'%P',<bitmap>	Set Picture/Bitmap (empty is clear)
'%I',<icon 1-255, 0-clear>	Set Icon
'%J',<alignment of text 1-9>	Set text alignment using telephone Keypad layout (1 = left,top 5 = center,middle 9 = right,bottom)
'%C1',<on fill color>	Set On Fill Color
'%C2',<off fill color>	Set Off Fill Color
'%C3',<on border color>	Set On Border Color
'%C4',<off border color>	Set Off Border Color
'%C5',<on text color>	Set On Text Color
'%C6',<off text color>	Set Off Text Color

"'@SHO',<variable text address 1-255>,<ON/OFF 1-0>"
Turns Button On or Off (show/hide).

"'@ENA',<variable text address 1-255>,<ON/OFF 0-1>"
Enables Button On or Off (enable/disable).

"'@ICO',<variable text address 1-255>,<icon index 0-255>"
Set Icon, 0 is clear.

"'@BMP',<variable text address 1-255>,'<name of bitmap>'"
Set Bitmap.

"'@TXT',<variable text address 1-255>,'<new text to be put in button>'"
Set Text.

"'@UNI',<variable text address 1-255>,'<new text to be put in button>'"
Set Unicode Text.

"'@JUS',<variable text address 1-255>,<new text alignment>"
Set Text Alignment, use numeric keypad layout.
(7 = Left Bottom, 3= Right Top).

"'@FON',<variable text address 1-255>,<font size 1-255>"
Set Font.

Fixed Fonts are as follows:
1 = x-small
2 = small
4 = large
5 = x-large
6 = hollow medium
8 = hollow x-large
Variable Fonts start at 32.

"'@BOR',<variable text address 1-255>,<border style 0-41>"
Set Border only if the specified border is not the same as the current border.
Border styles are as follows:

no_border	0		
no_border_special	1	3dim_rect_1	20
single_line	2	3dim_rect_2	21
double_line	3	3dim_round_1	22
triple_line	4	3dim_round_2	23
single_rounded	5	3dim_neon_1	24
double_rounded	6	3dim_neon_2	25
single_raised	7	3dim_neon_blue	26
double_raised	8	3dim_neon_green	27
triple_raised	9		
double_line_2_single	10	single_diamond	40
double_line_3_single	11	double_diamond	41
double_shadow	12		

MISC. SEND COMMANDS:

"'@PWD-<page flip password>'"
Set page flip password

"'@PRO-<protected setup password>'"
Set protected setup password

"'@PPN-<pop-up page name>;<page name>'"
Activates a popup page with specified pop-up page name on page with specified specified page. If page name is empty, the current page is used.

"'@PPF-<pop-up page name>;<page name>'"
Deactivates a popup page with specified pop-up page name on page with specified page. If page name is empty, the current page is used. If pop-up page is part of a group, the whole group is deactivated.

"'@PPK-<pop-up page name>'"
Kill a popup page with specified pop-up page name from ALL pages. If pop-up page is part of a group, the whole group is deactivated.

"'@PPA-<page_name>'"
Close all popups on a page.

"'@PPX'"
Closes all popups on all pages.

"'@SWK-<string>'"

```
        Change Wakup string.

    "'@SSL-<string>'"
        Change Sleep string.

    "'@SST-<string>'"
        Change Startup string.

    "'@IDF'"
        Identify file. The panel returns a string with the DOS file name of the
        panel file like this:
        "'IDF-<dos file name>'"

    "'@IDP'"
        Identify project. The panel returns a string with the Project name of
        the panel file like this:
        "'IDP-<project name>'"

    "'@MOU' <touch_type>"
        Set the serial mouse type.
        Serial mouse types are as follows:
        Mouse Off               0
        MicroSoft Serial Mouse  1

-------------------------------------------------------------------------------
 all old style commands
-------------------------------------------------------------------------------

    "'CPAGE<color_number>-<page name>'"
        Sets the page with specified page name background color to the specified
        color.

    "'CFON<variable text address 1-255>-<color_number>'"
        Fill Color On.
        Sets the fill color for ON feedback to the specified color only if the
        specified fill on color is not the same as the current color.

    "'CFOFF<variable text address 1-255>-<color_number>'"
        Fill Color Off.
        Sets the fill color for OFF feedback to the specified color only if the
        specified fill off color is not the same as the current color.

    "'CBON<variable text address 1-255>-<color_number>'"
        Border Color On.
        Sets the border color for ON feedback to the specified color only if the
        specified border on color is not the same as the current color.

    "'CBOFF<variable text address 1-255>-<color_number>'"
        Border Color Off.
        Sets the border color for OFF feedback to the specified color only if
        the specified border off color is not the same as the current color.

    "'CTON<variable text address 1-255>-<color_number>'"
        Text Color On.
        Sets the text color for ON feedback to the specified color only if the
        specified text on color is not the same as the current color.
```

"'CTOFF<variable text address 1-255>-<color_number>'"
Text Color Off.
Sets the text color for OFF feedback to the specified color only if the specified text off color is not the same as the current color.

"'CALL<variable text address 1-255>-<data>"
Sets All colors for button. The data is a series of 6 color_numbers in this order:

FILL COLOR ON
FILL COLOR OFF
BORDER COLOR ON
BORDER COLOR OFF
TEXT COLOR ON
TEXT COLOR OFF

Example:
"'CALL1-1 3 0 0 72 74'"
Sets Variable Text Button 1 to:
FILL COLOR ON - RED one shade from brightest
FILL COLOR OFF - RED three shades from brightest
BORDER COLOR ON - RED brightest
BORDER COLOR OFF - RED brightest
TEXT COLOR ON - WHITE brightest
TEXT COLOR OFF - WHITE two shades from brightest

VARIABLE TEXT SEND_COMMANDS:

"'BTON<variable text address 1-255>'"
Turns specified button completely ON.

"'BTOF<variable text address 1-255>'"
Turns specified button OFF.

"'!B',<variable text address 1-255>,<ON/OFF 0-1>"
Turns Button On or Off.

"'!T',<variable text address 1-255>,'<new text to be put in button>'"
Shorthand and faster version of 'TEXT' command.
"'TEXT<variable text address 1-255>-<new text to be put in button>'"
Changes text in specified text button number.
A '|' character indicates a carriage return to begin next line down.
All text remains permanent even during power outage until changed with another TEXT command.
Example of usage:

| VCR |
| PLAY |

"'TEXT2-VCR|PLAY'" changes text button number 2 to display:

"'!F',<variable text address 1-255>,'<font size 1-255>'"
Shorthand and faster version of 'FONT' command.
"'FONT<variable text address 1-255>-<font size 1-255>'"
Changes font size (or style) of the text in specified text button number.
Fixed Fonts are as follows:
1 = x-small
2 = small

```
            4 = large
            5 = x-large
            6 = hollow medium
            8 = hollow x-large
        Variable Fonts start at 32.

    "'!I',<variable text address 1-255>,'<border style 0-41>'"
        Shorthand and faster version of 'ICON' command.
    "'ICON<variable text address 1-255>-<border style 0-41>'"
        Changes border style of the specified text button number.
        Border styles are as follows:
        no_border             0
        no_border_special     1          3dim_rect_1           20
        single_line           2          3dim_rect_2           21
        double_line           3          3dim_round_1          22
        triple_line           4          3dim_round_2          23
        single_rounded        5          3dim_neon_1           24
        double_rounded        6          3dim_neon_2           25
        single_raised         7          3dim_neon_blue        26
        double_raised         8          3dim_neon_green       27
        triple_raised         9
        double_line_2_single  10         single_diamond        40
        double_line_3_single  11         double_diamond        41
        double_shadow         12

        Example of usage:
         "'ICON25-6'"
         Changes border style of text button number 25 to double rounded.

    "'!C',<variable text address 1-255>,<border style 0-41>,<font>,
          '<new text to be put in button>'"
        Combination command that will set border,font,and text in one
        shorthand command.
        NOTE: border style and font are single byte non-ascii data!!

-------------------------------------------------------------------------------
  MISC. SEND COMMANDS:

    "'PAGE-<page name>'"
        Flips to page with specified page name.
        Example of usage:
         "'PAGE-MAIN'" flips to a page named MAIN on the panel.

    "'PPON-<page name>'"
        Activates a popup page with specified page name.
        Example of usage:
         "'PPON-TRANS'" Activates popup page named TRANS on the panel.

    "'PPOF-<page name>'"
        Deactivates a popup page with specified page name.
        Example of usage:
         "'PPOF-TRANS'" Deactivates popup page named TRANS on the panel.

    "'SETUP'"
        Sends panel to SETUP page.

    "'TPAGEON'"
```

Turns on page tracking, whereby when the page changes, a string is sent to the Master in the format "'PAGE-<page name>'". This string may be captured with a CREATE_BUFFER command for one panel and sent directly to another panel because it is in the format of a "'PAGE-'" command.

Example of usage:

```
DEFINE_VARIABLE
  TP1_BUF[25]
DEFINE_START
  CREATE_BUFFER TP1,TP1_BUF
DEFINE_PROGRAM
IF(LENGTH_STRING(TP1_BUF))  (* See if we got string from TP1 *)
{
  SEND_COMMAND TP2,TP1_BUF  (* Make TP2 page track TP1 *)
  TP1_BUF=''  (* Clear string buffer *)
}
```

"'TPAGEOFF'"
Turns off page tracking.

"'AKEYB-<inital text>'"
Pops up the keyboard icon and intializes the text string to that specified. Keyboard string is set to null on power up and is stored until power is lost.

"'AKEYP-<inital text>'"
Pops up the keypad icon and intializes the text string to that specified. Keypad string is set to null on power up and is stored until power is lost.

"'AKEYR'"
Remove keyboard or keypad that was displayed using "'AKEYB'", "'AKEYP'", or "'PKEYP'" commands.

"'PKEYP-<inital text>'"
Private Keypad.
Pops up the keypad icon and intializes the text string to that specified. Keypad displays a '*' instead of the numbers typed.

"'BEEP'"
Outputs a beep.

"'ABEEP'"
Outputs a beep duration 1 even if beep is off.

"'DBEEP'"
Outputs a double beep.

"'ADBEEP'"
Outputs a double beep even if beep is off.

"'QBEEP'"
Stops ALL beeps, including "'ABEEP'", "'ADBEEP'", and AXlink beeps.

"'WAKE'"
Forces panel out of screen saver mode.

```
    "'SLEEP'"
        Forces panel into screen saver mode.

    "'BRIT-<bright level>'"
        Sets the brightness level between 1 and 8.

    "'CONT-<contrast level>'"
        Sets the contrast level between 1 and 12.

    "'CLOCK mm-dd-yy hh:mm:ss'"
        Sets the time and date on the panel.

        Example of usage:
         "'CLOCK 01-08-93 19:16:00'"
         Sets the time to 7:16 PM and date to January 8, 1993

    "'MOUSE'"
        Turn on MicroSoft Serial Mouse.

    "'RESET'"
        Clears all panel status (same as power up), NOT memory.

    "'ZAP!'"
        Clears all memory (erases all buttons, pages, icons, fonts, and
        bitmaps).


-------------------------------------------------------------------------
  SPECIAL ON PANEL STRING COMMANDS:
    '$ST t' - Set screen timeout in t minutes 1-120.
    '$ID d' - Set Group Id of WavePack.
    '$SL'   - Put Panel to Sleep

-------------------------------------------------------------------------
  WAVE SEND COMMANDS:

    '#ST t' Sets the power down sleep time to t minutes (1-120 or 0 for OFF).
            Also resets sleep timer.

-------------------------------------------------------------------------
  Special Button Strings:

  WAVE GROUP ID:        Assign a standard string to a button that is formatted
                        as follows:   $ID n    where n is Group ID (0-15).

  WAVE SLEEP TIME:      Assign a standard string to a button that is formatted
                        as follows:   $ST t    where t is Sleep Time in
                                               minutes (1-120 or 0 for OFF).

-------------------------------------------------------------------------
-------------------------------------------------------------------------
```

56 AXT-CP Tilt Passive Color Touch Panel (640x480)

57 AXU-CP Unimount Passive Color Touch Panel (640x480)

57.1 COMMANDS

(SEND_COMMAND DEV,"command")

```
-------------------
  COLOR SEND_COMMANDS:

   Color Numbers: Light to Dark
    RED     :0-5           ORANGE  :6-11
    YELLOW  :12-17         LIME    :18-23
    GREEN   :24-29         AQUA    :30-35
    CYAN    :36-41         ROYAL   :42-47
    BLUE    :48-53         PURPLE  :54-59
    MAGENTA :60-65         PINK    :66-71
    WHITE   :72-77         GREY    :78-83
    MORE GREYS: 84-86
    BLACK   :87

    TRANSPARENT    255

------------------------------------------------------------------------------
 New command format starts with @
 Most commands are in what is known as "shorthand" format
 where the data is always one-byte non-ascii data except
 for pages, passwords, text and bitmap names.
------------------------------------------------------------------------------

    "'@CPG',<color_number>,'<page name>'"
        Sets the page with specified page name background color to the specified
        color only if the specified background color is not the same as the
        current color.

    "'@CPP',<color_number>,'<pop-up page name>'"
        Sets the page with specified pop-up page name background color to the
        specified color only if the specified background color is not the same
        as the current color.

    "'@CFN',<variable text address 1-255>,<color_number>"
        Fill Color On.
        Sets the fill color for ON feedback to the specified color only if the
        specified fill on color is not the same as the current color.

    "'@CFF',<variable text address 1-255>,<color_number>"
        Fill Color Off.
        Sets the fill color for OFF feedback to the specified color only if the
        specified fill off color is not the same as the current color.

    "'@CBN',<variable text address 1-255>,<color_number>"
        Border Color On.
        Sets the border color for ON feedback to the specified color only if the
        specified border on color is not the same as the current color.
```

"'@CBF',<variable text address 1-255>,<color_number>"
Border Color Off.
Sets the border color for OFF feedback to the specified color only if the specified border off color is not the same as the current color.

"'@CTN',<variable text address 1-255>,<color_number>"
Text Color On.
Sets the text color for ON feedback to the specified color only if the specified text on color is not the same as the current color.

"'@CTF',<variable text address 1-255>,<color_number>"
Text Color Off.
Sets the text color for OFF feedback to the specified color only if the specified text off color is not the same as the current color.

VARIABLE TEXT SEND_COMMANDS:

NOTE:DATA FOR ALL COMMANDS EXCEPT TEXT AND BITMAP
ARE SINGLE BYTE NON-ASCII DATA!!

"'@BMF',<variable text address 1-255>,'<data>'"

Set any/all button parameters by sending embedded codes and data.
Codes are:

'%B',<border 1-27,40,41>	Set Border
'%F',<font 1-8,32-xx>	Set Font
'%T',<text>	Set Text (empty is clear)
'%P',<bitmap>	Set Picture/Bitmap (empty is clear)
'%I',<icon 1-255, 0-clear>	Set Icon
'%J',<alignment of text 1-9>	Set text alignment using telephone Keypad layout (1 = left,top 5 = center,middle 9 = right,bottom)
'%C1',<on fill color>	Set On Fill Color
'%C2',<off fill color>	Set Off Fill Color
'%C3',<on border color>	Set On Border Color
'%C4',<off border color>	Set Off Border Color
'%C5',<on text color>	Set On Text Color
'%C6',<off text color>	Set Off Text Color

"'@SHO',<variable text address 1-255>,<ON/OFF 1-0>"
Turns Button On or Off (show/hide).

"'@ENA',<variable text address 1-255>,<ON/OFF 0-1>"
Enables Button On or Off (enable/disable).

"'@ICO',<variable text address 1-255>,<icon index 0-255>"
Set Icon, 0 is clear.

"'@BMP',<variable text address 1-255>,'<name of bitmap>'"
Set Bitmap.

"'@TXT',<variable text address 1-255>,'<new text to be put in button>'"
Set Text.

"'@UNI',<variable text address 1-255>,'<new text to be put in button>'"
Set Unicode Text.

"'@JUS',<variable text address 1-255>,<new text alignment>"
Set Text Alignment, use numeric keypad layout.
(7 = Left Bottom, 3= Right Top).

"'@FON',<variable text address 1-255>,<font size 1-255>"
Set Font.
Fixed Fonts are as follows:
1 = x-small
2 = small
4 = large
5 = x-large
6 = hollow medium
8 = hollow x-large
Variable Fonts start at 32.

"'@BOR',<variable text address 1-255>,<border style 0-41>"
Set Border only if the specified border is not the same as the current border.
Border styles are as follows:

no_border	0		
no_border_special	1	3dim_rect_1	20
single_line	2	3dim_rect_2	21
double_line	3	3dim_round_1	22
triple_line	4	3dim_round_2	23
single_rounded	5	3dim_neon_1	24
double_rounded	6	3dim_neon_2	25
single_raised	7	3dim_neon_blue	26
double_raised	8	3dim_neon_green	27
triple_raised	9		
double_line_2_single	10	single_diamond	40
double_line_3_single	11	double_diamond	41
double_shadow	12		

MISC. SEND COMMANDS:

"'@PWD-<page flip password>'"
Set page flip password

"'@PRO-<protected setup password>'"
Set protected setup password

"'@PPN-<pop-up page name>;<page name>'"
Activates a popup page with specified pop-up page name on page with specified specified page. If page name is empty, the current page is used.

"'@PPF-<pop-up page name>;<page name>'"
Deactivates a popup page with specified pop-up page name on page with specified page. If page name is empty, the current page is used. If pop-up page is part of a group, the whole group is deactivated.

"'@PPK-<pop-up page name>'"

```
        Kill a popup page with specified pop-up page name from ALL pages. If
        pop-up page is part of a group, the whole group is deactivated.

    "'@PPA-<page_name>'"
        Close all popups on a page.

    "'@PPX'"
        Closes all popups on all pages.

    "'@SWK-<string>'"
        Change Wakup string.

    "'@SSL-<string>'"
        Change Sleep string.

    "'@SST-<string>'"
        Change Startup string.

    "'@IDF'"
        Identify file. The panel returns a string with the DOS file name of the
        panel file like this:
        "'IDF-<dos file name>'"

    "'@IDP'"
        Identify project. The panel returns a string with the Project name of
        the panel file like this:
        "'IDP-<project name>'"

    "'@MOU' <touch_type>"
        Set the serial mouse type.
        Serial mouse types are as follows:
        Mouse Off               0
        MicroSoft Serial Mouse  1

-------------------------------------------------------------------------------
 all old style commands
-------------------------------------------------------------------------------

    "'CPAGE<color_number>-<page name>'"
        Sets the page with specified page name background color to the specified
        color.

    "'CFON<variable text address 1-255>-<color_number>'"
        Fill Color On.
        Sets the fill color for ON feedback to the specified color only if the
        specified fill on color is not the same as the current color.

    "'CFOFF<variable text address 1-255>-<color_number>'"
        Fill Color Off.
        Sets the fill color for OFF feedback to the specified color only if the
        specified fill off color is not the same as the current color.

    "'CBON<variable text address 1-255>-<color_number>'"
        Border Color On.
        Sets the border color for ON feedback to the specified color only if the
        specified border on color is not the same as the current color.
```

"'CBOFF<variable text address 1-255>-<color_number>'"
Border Color Off.
Sets the border color for OFF feedback to the specified color only if the specified border off color is not the same as the current color.

"'CTON<variable text address 1-255>-<color_number>'"
Text Color On.
Sets the text color for ON feedback to the specified color only if the specified text on color is not the same as the current color.

"'CTOFF<variable text address 1-255>-<color_number>'"
Text Color Off.
Sets the text color for OFF feedback to the specified color only if the specified text off color is not the same as the current color.

"'CALL<variable text address 1-255>-<data>"
Sets All colors for button. The data is a series of 6 color_numbers in this order:

FILL COLOR ON
FILL COLOR OFF
BORDER COLOR ON
BORDER COLOR OFF
TEXT COLOR ON
TEXT COLOR OFF

Example:
"'CALL1-1 3 0 0 72 74'"
Sets Variable Text Button 1 to:
FILL COLOR ON - RED one shade from brightest
FILL COLOR OFF - RED three shades from brightest
BORDER COLOR ON - RED brightest
BORDER COLOR OFF - RED brightest
TEXT COLOR ON - WHITE brightest
TEXT COLOR OFF - WHITE two shades from brightest

VARIABLE TEXT SEND_COMMANDS:

"'BTON<variable text address 1-255>'"
Turns specified button completely ON.

"'BTOF<variable text address 1-255>'"
Turns specified button OFF.

"'!B',<variable text address 1-255>,<ON/OFF 0-1>"
Turns Button On or Off.

"'!T',<variable text address 1-255>,'<new text to be put in button>'"
Shorthand and faster version of 'TEXT' command.
"'TEXT<variable text address 1-255>-<new text to be put in button>'"
Changes text in specified text button number.
A '|' character indicates a carriage return to begin next line down.
All text remains permanent even during power outage until changed with another TEXT command.
Example of usage:

```
------
| VCR  |
```

"'TEXT2-VCR|PLAY'" changes text button number 2 to display: | PLAY |

"'!F',<variable text address 1-255>,'<font size 1-255>'"
Shorthand and faster version of 'FONT' command.

"'FONT<variable text address 1-255>-<font size 1-255>'"
Changes font size (or style) of the text in specified text button number.
Fixed Fonts are as follows:
1 = x-small
2 = small
4 = large
5 = x-large
6 = hollow medium
8 = hollow x-large
Variable Fonts start at 32.

"'!I',<variable text address 1-255>,'<border style 0-41>'"
Shorthand and faster version of 'ICON' command.

"'ICON<variable text address 1-255>-<border style 0-41>'"
Changes border style of the specified text button number.
Border styles are as follows:

no_border	0		
no_border_special	1	3dim_rect_1	20
single_line	2	3dim_rect_2	21
double_line	3	3dim_round_1	22
triple_line	4	3dim_round_2	23
single_rounded	5	3dim_neon_1	24
double_rounded	6	3dim_neon_2	25
single_raised	7	3dim_neon_blue	26
double_raised	8	3dim_neon_green	27
triple_raised	9		
double_line_2_single	10	single_diamond	40
double_line_3_single	11	double_diamond	41
double_shadow	12		

Example of usage:
"'ICON25-6'"
Changes border style of text button number 25 to double rounded.

"'!C',<variable text address 1-255>,<border style 0-41>,<font>,
'<new text to be put in button>'"
Combination command that will set border,font,and text in one shorthand command.
NOTE: border style and font are single byte non-ascii data!!

MISC. SEND COMMANDS:

"'PAGE-<page name>'"
Flips to page with specified page name.
Example of usage:
"'PAGE-MAIN'" flips to a page named MAIN on the panel.

"'PPON-<page name>'"
Activates a popup page with specified page name.
Example of usage:
"'PPON-TRANS'" Activates popup page named TRANS on the panel.

"'PPOF-<page name>'"
    Deactivates a popup page with specified page name.
    Example of usage:
     "'PPOF-TRANS'" Deactivates popup page named TRANS on the panel.

"'SETUP'"
    Sends panel to SETUP page.

"'TPAGEON'"
    Turns on page tracking, whereby when the page changes, a string is sent
    to the Master in the format "'PAGE-<page name>'". This string may be
    captured with a CREATE_BUFFER command for one panel and sent directly to
    another panel because it is in the format of a "'PAGE-'" command.

   Example of usage:
     DEFINE_VARIABLE
       TP1_BUF[25]
     DEFINE_START
       CREATE_BUFFER TP1,TP1_BUF
     DEFINE_PROGRAM
     IF(LENGTH_STRING(TP1_BUF)) (* See if we got string from TP1 *)
       {
       SEND_COMMAND TP2,TP1_BUF (* Make TP2 page track TP1 *)
       TP1_BUF='' (* Clear string buffer *)
       }

"'TPAGEOFF'"
    Turns off page tracking.

"'AKEYB-<inital text>'"
     Pops up the keyboard icon and intializes the text string to that
     specified. Keyboard string is set to null on power up and is stored
     until power is lost.

"'AKEYP-<inital text>'"
    Pops up the keypad icon and intializes the text string to that
    specified. Keypad string is set to null on power up and is stored until
    power is lost.

"'AKEYR'"
    Remove keyboard or keypad that was displayed using "'AKEYB'", "'AKEYP'",
    or "'PKEYP'" commands.

"'PKEYP-<inital text>'"
    Private Keypad.
    Pops up the keypad icon and intializes the text string to that
    specified. Keypad displays a '*' instead of the numbers typed.

"'BEEP'"
    Outputs a beep.

"'ABEEP'"
    Outputs a beep duration 1 even if beep is off.

"'DBEEP'"
    Outputs a double beep.

```
    "'ADBEEP'"
        Outputs a double beep even if beep is off.

    "'QBEEP'"
        Stops ALL beeps, including "'ABEEP'", "'ADBEEP'", and AXlink beeps.

    "'WAKE'"
        Forces panel out of screen saver mode.

    "'SLEEP'"
        Forces panel into screen saver mode.

    "'BRIT-<bright level>'"
        Sets the brightness level between 1 and 8.

    "'CLOCK mm-dd-yy hh:mm:ss'"
        Sets the time and date on the panel.

        Example of usage:
         "'CLOCK 01-08-93 19:16:00'"
         Sets the time to 7:16 PM and date to January 8, 1993

    "'MOUSE'"
        Turn on MicroSoft Serial Mouse.

    "'RESET'"
        Clears all panel status (same as power up), NOT memory.

    "'ZAP!'"
        Clears all memory (erases all buttons, pages, icons, fonts, and
        bitmaps).

    "'CALIBRATE'"
        Enters calibrate sequence immediately.

-------------------------------------------------------------------------
  SPECIAL ON PANEL STRING COMMANDS:
    "'$ST <sleep timeout>'"
        Set sleep timeout in minutes 1-120.

    "'$ID <WavePak ID>'"
        Set Group Id of WavePack.

    "'$SL'"
        Put Panel to Sleep

-------------------------------------------------------------------------
  WAVE SEND COMMANDS:

    "'#ST t'"
        Sets the power down sleep time to t minutes (1-120 or 0 for OFF).
        Also resets sleep timer.

-------------------------------------------------------------------------
  Special Button Strings:
```

WAVE GROUP ID: Assign a standard string to a button that is formatted as follows: $ID n where n is Group ID (0-15).

WAVE SLEEP TIME: Assign a standard string to a button that is formatted as follows: $ST t where t is Sleep Time in minutes (1-120 or 0 for OFF).

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58 AXT-MCA Tilt Active MiniColor Touch Panel (320x240)

59 AXU-MCA Unimount Active MiniColor Touch Panel (320x240)

60 AXT-MCV Tilt Video MiniColor Touch Panel (320x240)

61 AXU-MCV Unimount Video MiniColor Touch Panel (320x240)

61.1 COMMANDS

(SEND_COMMAND DEV,"command")

```
  COLOR SEND_COMMANDS: (all versions after V3.00)
   Color Numbers: Light to Dark
         RED             :0-5      ORANGE         :6-11
         YELLOW          :12-17    LIME           :18-23
         GREEN           :24-29    AQUA           :30-35
         CYAN            :36-41    ROYAL          :42-47
         BLUE            :48-53    PURPLE         :54-59
         MAGENTA         :60-65    PINK           :66-71
         WHITE           :72-77    GREY           :78-83
         MORE GREYS      :84-86
         BLACK           :87
         TRANSPARENT     :255

-------------------------------------------------------------------------
 The following "new style" SEND_COMMANDs are only valid for V3.00 and above.
 The new command format starts with "@". Most commands are in what is known as
 "shorthand" format where the data is always one-byte non-ascii data except
 for pages, passwords, text and bitmap names.
-------------------------------------------------------------------------

    "'@CPG',<color_number>,'<page name>'"
        Sets the page with specified page name background color to the specified
        color only if the specified background color is not the same as the
        current color.

    "'@CPP',<color_number>,'<pop-up page name>'"
        Sets the page with specified pop-up page name background color to the
        specified color only if the specified background color is not the same
        as the current color.

    "'@CFN',<variable text address 1-255>,<color_number>"
        Fill Color On.
        Sets the fill color for ON feedback to the specified color only if the
        specified fill on color is not the same as the current color.

    "'@CFF',<variable text address 1-255>,<color_number>"
        Fill Color Off.
        Sets the fill color for OFF feedback to the specified color only if the
        specified fill off color is not the same as the current color.

    "'@CBN',<variable text address 1-255>,<color_number>"
        Border Color On.
```

Sets the border color for ON feedback to the specified color only if the specified border on color is not the same as the current color.

"'@CBF',<variable text address 1-255>,<color_number>"
Border Color Off.
Sets the border color for OFF feedback to the specified color only if the specified border off color is not the same as the current color.

"'@CTN',<variable text address 1-255>,<color_number>"
Text Color On.
Sets the text color for ON feedback to the specified color only if the specified text on color is not the same as the current color.

"'@CTF',<variable text address 1-255>,<color_number>"
Text Color Off.
Sets the text color for OFF feedback to the specified color only if the specified text off color is not the same as the current color.

VARIABLE TEXT SEND_COMMANDS:

NOTE:DATA FOR ALL COMMANDS EXCEPT TEXT AND BITMAP
ARE SINGLE BYTE NON-ASCII DATA!!

"'@BMF',<variable text address 1-255>,'<data>'"

Set any/all button parameters by sending embedded codes and data.
Codes are:

'%B',<border 1-27,40,41>	Set Border
'%F',<font 1-8,32-xx>	Set Font
'%T',<text>	Set Text (empty is clear)
'%P',<bitmap>	Set Picture/Bitmap (empty is clear)
'%I',<icon 1-255, 0-clear>	Set Icon
'%J',<alignment of text 1-9>	Set text alignment using telephone Keypad layout (1 = left,top 5 = center,middle 9 = right,bottom)
'%C1',<on fill color>	Set On Fill Color
'%C2',<off fill color>	Set Off Fill Color
'%C3',<on border color>	Set On Border Color
'%C4',<off border color>	Set Off Border Color
'%C5',<on text color>	Set On Text Color
'%C6',<off text color>	Set Off Text Color

"'@SHO',<variable text address 1-255>,<ON/OFF 1-0>"
Turns Button On or Off (show/hide).

"'@ENA',<variable text address 1-255>,<ON/OFF 0-1>"
Enables Button On or Off (enable/disable).

"'@ICO',<variable text address 1-255>,<icon index 0-255>"
Set Icon, 0 is clear.

"'@BMP',<variable text address 1-255>,'<name of bitmap>'"
Set Bitmap.

```
    "'@TXT',<variable text address 1-255>,'<new text to be put in button>'"
       Set Text.

    "'@UNI',<variable text address 1-255>,'<new text to be put in button>'"
       Set Unicode Text.

    "'@JUS',<variable text address 1-255>,<new text alignment>"
       Set Text Alignment, use numeric keypad layout.
       (7 = Left Bottom, 3= Right Top).

    "'@FON',<variable text address 1-255>,<font size 1-255>"
       Set Font.
       Fixed Fonts are as follows:
           1 = x-small
           2 = small
           4 = large
           5 = x-large
           6 = hollow medium
           8 = hollow x-large
       Variable Fonts start at 32.

    "'@BOR',<variable text address 1-255>,<border style 0-41>"
       Set Border only if the specified border is not the same as the current
       border.
       Border styles are as follows:
       no_border             0
       no_border_special     1          3dim_rect_1           20
       single_line           2          3dim_rect_2           21
       double_line           3          3dim_round_1          22
       triple_line           4          3dim_round_2          23
       single_rounded        5          3dim_neon_1           24
       double_rounded        6          3dim_neon_2           25
       single_raised         7          3dim_neon_blue        26
       double_raised         8          3dim_neon_green       27
       triple_raised         9
       double_line_2_single  10         single_diamond        40
       double_line_3_single  11         double_diamond        41
       double_shadow         12

-------------------------------------------------------------------------
  MISC. SEND COMMANDS:

    "'@PWD-<page flip password>'"
       Set page flip password

    "'@PRO-<protected setup password>'"
       Set protected setup password

    "'@PPN-<pop-up page name>;<page name>'"
       Activates a popup page with specified pop-up page name on page with
       specified specified page. If page name is empty, the current page is
       used.

    "'@PPF-<pop-up page name>;<page name>'"
       Deactivates a popup page with specified pop-up page name on page with
       specified page. If page name is empty, the current page is used. If
```

pop-up page is part of a group, the whole group is deactivated.

"'@PPK-<pop-up page name>'"
Kill a popup page with specified pop-up page name from ALL pages. If pop-up page is part of a group, the whole group is deactivated.

"'@PPA-<page_name>'"
Close all popups on a page.

"'@PPX'"
Closes all popups on all pages.

"'@SWK-<string>'"
Change Wakup string.

"'@SSL-<string>'"
Change Sleep string.

"'@SST-<string>'"
Change Startup string.

"'@IDF'"
Identify file. The panel returns a string with the DOS file name of the panel file like this:
"'IDF-<dos file name>'"

"'@IDP'"
Identify project. The panel returns a string with the Project name of the panel file like this:
"'IDP-<project name>'"

"'@MOU' <touch_type>"
Set the serial mouse type.
Serial mouse types are as follows:
Mouse Off 0
MicroSoft Serial Mouse 1

---

all old style commands

"'CPAGE<color_number>-<page name>'"
Sets the page with specified page name background color to the specified color.

"'CFON<variable text address 1-255>-<color_number>'"
Fill Color On.
Sets the fill color for ON feedback to the specified color only if the specified fill on color is not the same as the current color.

"'CFOFF<variable text address 1-255>-<color_number>'"
Fill Color Off.
Sets the fill color for OFF feedback to the specified color only if the specified fill off color is not the same as the current color.

"'CBON<variable text address 1-255>-<color_number>'"
Border Color On.

Sets the border color for ON feedback to the specified color only if the specified border on color is not the same as the current color.

"'CBOFF<variable text address 1-255>-<color_number>'"
Border Color Off.
Sets the border color for OFF feedback to the specified color only if the specified border off color is not the same as the current color.

"'CTON<variable text address 1-255>-<color_number>'"
Text Color On.
Sets the text color for ON feedback to the specified color only if the specified text on color is not the same as the current color.

"'CTOFF<variable text address 1-255>-<color_number>'"
Text Color Off.
Sets the text color for OFF feedback to the specified color only if the specified text off color is not the same as the current color.

"'CALL<variable text address 1-255>-<data>"
Sets All colors for button. The data is a series of 6 color_numbers in this order:

FILL COLOR ON
FILL COLOR OFF
BORDER COLOR ON
BORDER COLOR OFF
TEXT COLOR ON
TEXT COLOR OFF

Example:
"'CALL1-1 3 0 0 72 74'"
Sets Variable Text Button 1 to:
FILL COLOR ON - RED one shade from brightest
FILL COLOR OFF - RED three shades from brightest
BORDER COLOR ON - RED brightest
BORDER COLOR OFF - RED brightest
TEXT COLOR ON - WHITE brightest
TEXT COLOR OFF - WHITE two shades from brightest

VARIABLE TEXT SEND_COMMANDS:

"'BTON<variable text address 1-255>'"
Turns specified button completely ON.

"'BTOF<variable text address 1-255>'"
Turns specified button OFF.

"'!B',<variable text address 1-255>,<ON/OFF 0-1>"
Turns Button On or Off.

"'!T',<variable text address 1-255>,'<new text to be put in button>'"
Shorthand and faster version of 'TEXT' command.
"'TEXT<variable text address 1-255>-<new text to be put in button>'"
Changes text in specified text button number.
A '|' character indicates a carriage return to begin next line down.
All text remains permanent even during power outage until changed with

another TEXT command.
Example of usage:

"'TEXT2-VCR|PLAY'" changes text button number 2 to display:

VCR
PLAY

"'!F',<variable text address 1-255>,'<font size 1-255>'"
Shorthand and faster version of 'FONT' command.
"'FONT<variable text address 1-255>-<font size 1-255>'"
Changes font size (or style) of the text in specified text button number.
Fixed Fonts are as follows:
1 = x-small
2 = small
4 = large
5 = x-large
6 = hollow medium
8 = hollow x-large
Variable Fonts start at 32.

"'!I',<variable text address 1-255>,'<border style 0-41>'"
Shorthand and faster version of 'ICON' command.
"'ICON<variable text address 1-255>-<border style 0-41>'"
Changes border style of the specified text button number.
Border styles are as follows:

no_border	0		
no_border_special	1	3dim_rect_1	20
single_line	2	3dim_rect_2	21
double_line	3	3dim_round_1	22
triple_line	4	3dim_round_2	23
single_rounded	5	3dim_neon_1	24
double_rounded	6	3dim_neon_2	25
single_raised	7	3dim_neon_blue	26
double_raised	8	3dim_neon_green	27
triple_raised	9		
double_line_2_single	10	single_diamond	40
double_line_3_single	11	double_diamond	41
double_shadow	12		

Example of usage:
"'ICON25-6'"
Changes border style of text button number 25 to double rounded.

"'!C',<variable text address 1-255>,<border style 0-41>,<font>,
'<new text to be put in button>'"
Combination command that will set border,font,and text in one shorthand command.
NOTE: border style and font are single byte non-ascii data!!

MISC. SEND COMMANDS:

"'PAGE-<page name>'"
Flips to page with specified page name.
Example of usage:
"'PAGE-MAIN'" flips to a page named MAIN on the panel.

"'PPON-<page name>'"

```
    Activates a popup page with specified page name.
    Example of usage:
     "'PPON-TRANS'" Activates popup page named TRANS on the panel.

"'PPOF-<page name>'"
    Deactivates a popup page with specified page name.
    Example of usage:
     "'PPOF-TRANS'" Deactivates popup page named TRANS on the panel.

"'SETUP'"
    Sends panel to SETUP page.

"'TPAGEON'"
    Turns on page tracking, whereby when the page changes, a string is sent
    to the Master in the format "'PAGE-<page name>'". This string may be
    captured with a CREATE_BUFFER command for one panel and sent directly to
    another panel because it is in the format of a "'PAGE-'" command.

   Example of usage:
     DEFINE_VARIABLE
       TP1_BUF[25]
     DEFINE_START
       CREATE_BUFFER TP1,TP1_BUF
     DEFINE_PROGRAM
     IF(LENGTH_STRING(TP1_BUF))  (* See if we got string from TP1 *)
       {
       SEND_COMMAND TP2,TP1_BUF  (* Make TP2 page track TP1 *)
       TP1_BUF=''  (* Clear string buffer *)
       }

"'TPAGEOFF'"
    Turns off page tracking.

"'AKEYB-<inital text>'"
     Pops up the keyboard icon and intializes the text string to that
     specified. Keyboard string is set to null on power up and is stored
     until power is lost.

"'AKEYP-<inital text>'"
    Pops up the keypad icon and intializes the text string to that
    specified. Keypad string is set to null on power up and is stored until
    power is lost.

"'AKEYR'"
    Remove keyboard or keypad that was displayed using "'AKEYB'", "'AKEYP'",
    or "'PKEYP'" commands.

"'PKEYP-<inital text>'"
    Private Keypad.
    Pops up the keypad icon and intializes the text string to that
    specified. Keypad displays a '*' instead of the numbers typed.

"'BEEP'"
    Outputs a beep.

"'ABEEP'"
    Outputs a beep duration 1 even if beep is off.
```

```
    "'DBEEP'"
        Outputs a double beep.

    "'ADBEEP'"
        Outputs a double beep even if beep is off.

    "'QBEEP'"
        Stops ALL beeps, including "'ABEEP'", "'ADBEEP'", and AXlink beeps.

    "'WAKE'"
        Forces panel out of screen saver mode.

    "'SLEEP'"
        Forces panel into screen saver mode.

    "'BRIT-<bright level>'"
        Sets the brightness level between 1 and 8.

    "'CLOCK mm-dd-yy hh:mm:ss'"
        Sets the time and date on the panel.

        Example of usage:
         "'CLOCK 01-08-93 19:16:00'"
         Sets the time to 7:16 PM and date to January 8, 1993

    "'MOUSE'"
        Turn on MicroSoft Serial Mouse.

    "'RESET'"
        Clears all panel status (same as power up), NOT memory.

    "'ZAP!'"
        Clears all memory (erases all buttons, pages, icons, fonts, and
        bitmaps).

    "'CALIBRATE'"
        Enters calibrate sequence immediately.

-------------------------------------------------------------------------
  SPECIAL ON PANEL STRING COMMANDS:
    "'$ST <sleep timeout>'"
        Set sleep timeout in minutes 1-120.

    "'$ID <WavePak ID>'"
        Set Group Id of WavePack.

    "'$SL'"
        Put Panel to Sleep

-------------------------------------------------------------------------
  VIDEO COMMANDS:

    "'@VBR<New setting in ascii>'"
        Video Signal Brightness   0-255.

    "'@VCT<New setting in ascii>'"
```

```
        Video Signal Contrast 0-255.

    "'@VST<New setting in ascii>'"
        Video Signal Saturation  0-255.

    "'@VHU<New setting in ascii>'"
        Video Signal Hue  0-255.

    "'@VSD'"
        Video Default Settings (Brightness, Contrast, Saturation, Hue).

    "'@VDD<New setting in ascii>'"
        Video setting for video standard detection.
        Video standard settings are as follows:
            NTSC Manual Set         2
            PAL Manual Set          3
            Secam Manual Set        4

-------------------------------------------------------------------------
  WAVE SEND COMMANDS:

    '#ST t' Sets the power down sleep time to t minutes (1-120 or 0 for OFF).
            Also resets sleep timer.

-------------------------------------------------------------------------
  Special Button Strings:

  WAVE GROUP ID:        Assign a standard string to a button that is formatted
                        as follows:   $ID n    where n is Group ID (0-15).

  WAVE SLEEP TIME:      Assign a standard string to a button that is formatted
                        as follows:   $ST t    where t is Sleep Time in
                                               minutes (1-120 or 0 for OFF).

-------------------------------------------------------------------------
-------------------------------------------------------------------------
```

62 PCTouch

62.1 COMMANDS

(SEND_COMMAND DEV,”command”)

(Note: There are two lists below, the first (under Commands:) is the list of native SEND_COMMANDs, the second (under Supported TouchPanel Commands:) is the subset of the TouchPanel SEND_COMMANDs that PCTouch supports.)

Commands:

'BEEP-beepID' - Causes the computer to generate an audible tone.

beepID may be one of the following:
-1 (Beep)
MB_ICONASTERISK (Asterisk)
MB_ICONEXCLAMATION (Exclamation)
MB_ICONHAND (Critical Stop)
MB_ICONQUESTION (Question)
MB_OK (Default Beep)
Example:
SEND_COMMAND PCCOM,"'BEEP-MB_OK'"

'DISABLE-objectID' - Disables the specified object.

'DOHELP-filename,helpID,helpData' - Request that WinHelp perform the action defined by helpID and helpData on the file filename.

filename - The full path to the help file.
helpID and helpData - Refer to the following table.

helpID	helpData
HELP_CONTEXT	An unsigned long integer containing the context number for the topic. Displays Help for a particular topic identified by a context number that has been defined in the [MAP] section of the .HPJ file.
HELP_CONTENTS	Ignored; applications should set to 0. Displays the Help contents topic as defined by the Contents option in the [OPTIONS] section of the .HPJ file.
HELP_SETCONTENTS	An unsigned long integer containing the context number for the topic the application wants to designate as the Contents topic. Determines which topic WinHelp should display when a user presses the Contents button.
HELP_CONTEXTPOPUP	An unsigned long integer containing the context number for a topic. Displays in a pop-up window a particular Help topic identified by a context number that has been defined in the [MAP] section of the .HPJ file.
HELP_HELPONHELP	Ignored; applications should set to 0.

Displays the Contents topic of the designated
Using Help file.
HELP_QUIT Ignored; applications should set to 0.
Informs the Help application that Help is no
longer needed. If no other applications have
asked for Help, Windows closes the Help
application.

Example
SEND_COMMAND PCCOM,"'DOHELP-c:\amx\example.hlp,HELP_CONTENTS,0'"
Opens the example.hlp file found in the c:\amx directory to
the contents page.

'ENABLE-objectID' - Enables the specified object.

objectID - An identifier assigned to the object (button, gauge,
etc.)
in PCDesign. Valid values are in the range 1-65,535, inclusive.

'HIDE-objectID' - Hides the specified object.

objectID - An identifier assigned to the object (button, gauge,
etc.)
in PCDesign. Valid values are in the range 1-65,535, inclusive.
HIDE
is the opposite of command SHOW.

'KEYENTRY-keyID [,"PromptText"[,"DefaultText"]][,password[,clientID]]'
Displays a keypad, keyboard or simple dialog box as defined
by keyID. The input characters can be hidden from view by using
the "password" option. After entering the string, it is sent to
AXCESS through a SEND_STRING with either KEYB- or KEYP-
prepended to the string.

keyID - The type of entry dialog.
KEYPAD - Numeric keypad
KEYBOARD - Alphanumeric keyboard
KEYENTRY - A simple dialog box; string is sent with a KEYP
PromptText - A string of text that will appear above the entry
field. Since double-quotes are delimiters, if you want to
embed one, use two in a row.
DefaultText - A string of text that will appear in the entry
field. Since double-quotes are delimiters, if you want to
embed one, use two in a row.
password - Flag indicating if the input should be visible, 0, or
hidden, 1.
clientID - Flag indicating whether or not the clientID should be
prepended to the string that is sent to AXCESS. Used in
client/server environments.

Examples:
SEND_COMMAND PCCOM,"'KEYENTRY-KEYPAD,1'"
A numeric keypad is displayed with the input replaced with
asterisks on the screen. After hitting the Enter button,
the numbers that the user typed (not the asterisks) are sent
to the master as a SEND_STRING with KEYP- prepended to the

```
                input.
             SEND_COMMAND PCCOM,"'KEYENTRY-KEYENTRY,"Enter Name","User"'"
                A simple dialog box is displayed with the prompt "Enter Name"
                and the input field prefilled in with "User". (The quotes are
                not shown in the dialog.)  After hitting the Enter button,
                the text that was typed in is sent to the master as a
                SEND_STRING with KEYB- prepended to the input.

      'LAUNCH-filename commandParam' - Requests that PCTouch launch an
             application with the given command-line parameters.

          filename - File name or application including the path.
          commandParam - Command-line parameters.

          Example
             SEND_COMMAND PCCOM,"'LAUNCH-c:\win\notepad c:\win\readme.txt'"
                Starts the notepad application with the readme.txt file both
                of which are located in the c:\win directory.

      'PBKCOLOR-pageName,color' - Changes the background color of the pageName
             page to color.

          pageName - The case sensitive name of a page.
          color - See notes at end.

          Example
             SEND_COMMAND 128,"'PBKCOLOR-MAIN PAGE,15'"
                or
             SEND_COMMAND 128,"'PBKCOLOR-MAIN PAGE,YELLOW'"
                or
             SEND_COMMAND 128,"'PBKCOLOR-MAIN PAGE,(255,255,0)'"

             Turns the page "MAIN PAGE" yellow.

      'PBKPICTURE-pageName,picture[,position]' - Changes the background
picture
             of the pageName page to picture and places the picture according
             to the optional position.

          pageName - The case sensitive name of a page.
          picture - A picture name that is in the PTX file or the full path
             of a .BMP file.  The tilde (~) will set the picture to none.
          position - Specifies the position of text and pictures.  For
pictures,
             can also specify stretch-to position using the optional
parameters
             starting at the hyphen (-).  The spec for this parameter
             is:C|T|(L|C|R)(T|M|B) [ - (L|C|R|N)[(T|M|B|N)]] where the values
             are defined as:
                C       center, center in the space
                T       tile, tile in the space
                L|C|R   left or center or right, location of upper left
corner
                        x position
                T|M|B   top or middle or bottom, location of upper left
corner
                        y position
```

N none, used with stretch-to

Example
SEND_COMMAND 128,"'PBKPICTURE-MAIN PAGE,c:\win\amx.bmp,LT-RB'"
Sets the page "MAIN PAGE" picture to the bitmap stored in the amx.bmp file in the c:\win directory. The picture is stretched to cover the page (from the Left-Top (LT) to the Right-Bottom (RB)).

'PICTURE-LoadState,PictureName[,FileName]' - Loads or unloads a picture.

LoadState - Determines if this is a load or unload action. The valid values are LOAD and UNLOAD.
PictureName - A picture name that is used in the PTX file.
FileName - The full path of a bitmap, .BMP, file. This parameter is only used for LOAD actions.

'PLAYLIVEVIDEO-objectID[,X[,Y[,H[,W[,windowCaption]]]]]' - Displays live video on the object identified by objectID or, if objectID is zero, in a popup window.

objectID - Either zero or an identifier assigned to the object (button, gauge, etc.) in PCDesign. Valid values are in the range 0-65,535, inclusive.
X,Y - The location where X is the horizontal component and Y the vertical. The Y axis the origin is the upper left corner, with Y increasing down.
H,W - The height and width.
windowCaption - The caption, or title, of a window.

Examples
SEND_COMMAND 128,"'PLAYLIVEVIDEO-99'"
Displays live video on the object identified as objectID 99.
or
SEND_COMMAND 128,"'PLAYLIVEVIDEO-0,0,0,200,200,"Camera 1"'"
Displays live video in a 200 by 200 popup window located in the upper left corner (0, 0) of the screen. The title, or caption, of the window is "Camera 1".

'PLAYSOUND-filename [,soundStyle]' - Plays a sound file (usually a Windows .WAV file). In order to hear the sound, the computer must have sound drivers installed.

filename - File name including path.
soundStyle - Defines how a sound file is played.
SND_DEFAULT - Normal, play once.
SND_STARTLOOP - Start repeating the sound file.
SND_STOPLOOP - Stop repeating the sound file.

Example
SEND_COMMAND 128,"'PLAYSOUND-c:\win\chimes.wav'"
Plays the chimes.wav .WAV file located in the c:\win directory using the default style.

'PLAYVIDEOCLIP-objectID,filename[,viewingStyle[,X[,Y[,H[,W[,
windowCaption]]]]]]' - Plays the filename video clip on the object

identified by objectID or, if objectID is zero, in a popup window. By default, the movie is resized to fit the window, although the behavior can be changed with the viewingStyle parameter.

objectID - Either zero or an identifier assigned to the object (button, gauge, etc.) in PCDesign. Valid values are in the range 0-65,535, inclusive.
filename - File name including path.
viewingStyle - Defines how a movie or window should be resized relative to the other.
VS_NORMAL - Actual movie size.
VS_STRETCH - Stretch movie to window.
VS_SIZE - Fit window to movie.
X,Y - The location where X is the horizontal component and Y the vertical. The Y axis the origin is the upper left corner, with Y increasing down.
H,W - The height and width.
windowCaption - The caption, or title, of a window.

Examples
SEND_COMMAND PCCOM,"'PLAYVIDEOCLIP-99,coyote.avi'"
Displays the the coyote.avi video clip on the object identified as objectID 99.
or
SEND_COMMAND PCCOM,"'PLAYVIDEOCLIP-0,coyote.avi,VS_SIZE,0,0, 200,200,"Clip"'"
Displays the coyote.avi video clip in a 200 by 200 popup window located in the upper left corner (0, 0) of the screen. The title, or caption, of the window is "Clip".

'SETBKCOLOR-objectID,buttonNumber,color' - Sets the background color for the buttonNumber state of the object identified by objectID to color.

objectID - An identifier assigned to the object (button, gauge, etc.)
in PCDesign. Valid values are in the range 1-65,535, inclusive.
buttonNumber - Defines a button state. For sliders and gauges the 1 or ALL option should be used.
1 - Channel Off/Released
2 - Channel Off/Pushed
3 - Channel On/Released
4 - Channel On/Pushed
ALL - Applies to all four states
color - See notes at end.

'SETBORDER-objectID, border' - Shows the border of the button with the given objectID according to border.

objectID - An identifier assigned to the object (button, gauge, etc.)
in PCDesign. Valid values are in the range 1-65,535, inclusive.
border - Defines whether a border is off (0) or on (1).

Example
SEND_COMMAND PCCOM,"'SETBORDER-99,0'"

```
            Turns off the border of the object identified as objectID 99.


        'SETPICTURE-objectID,buttonNumber,picture[,position]' - Sets the picture
            for the buttonNumber state of the object identified by objectID
            to picture and places the picture according to the optional
position.
            If no position is given, the existing position is used.

            objectID - An identifier assigned to the object (button, gauge,
etc.)
               in PCDesign.  Valid values are in the range 1-65,535, inclusive.
            buttonNumber - Defines a button state.  For sliders and gauges the
1
               or ALL option should be used.
                  1 - Channel Off/Released
                  2 - Channel Off/Pushed
                  3 - Channel On/Released
                  4 - Channel On/Pushed
                  ALL - Applies to all four states
            picture - A picture name that is in the PTX file or the full path
of a
               .BMP file.  The tilde (~) will set the picture to none.
            position - Specifies the position of text and pictures.  For
pictures,
               can also specify stretch-to position using the optional
parameters
               starting at the hyphen (-).  The spec for this parameter is:
               C|T|(L|C|R)(T|M|B)[-(L|C|R|N)[(T|M|B|N)]] where the values are
               defined as:
                  C - center, center in the space
                  T - tile, tile in the space
                  L|C|R - left or center or right, location of upper left
corner x position
                  T|M|B - top or middle or bottom, location of upper left
corner y position
                  N - none, used with stretch-to

            Example
               SEND_COMMAND PCCOM,"'SETPICTURE-99,2,Play Pushed'"
               Sets the picture of the object identified as objectID 99 to
"Play Pushed"
                  (a picture in the PTX  file) for the Channel On/Pushed state.

        'SETTEXT-objectID,buttonNumber,"text"' - Sets the text for the
buttonNumber
               state of the object identified by objectID to text.

            objectID - An identifier assigned to the object (button, gauge,
etc.)
               in PCDesign.  Valid values are in the range 1-65,535, inclusive.
            buttonNumber - Defines a button state.  For sliders and gauges the
1 or ALL
               option should be used.
                  1 - Channel Off/Released
                  2 - Channel Off/Pushed
                  3 - Channel On/Released
```

```
                  4 - Channel On/Pushed
                  ALL - Applies to all four states
            text - A string of text. Since double-quotes are delimiters, if you
want
               to embed one, use two in a row.

            Example
               SEND_COMMAND PCCOM,"'SETTEXT-99,ALL,"Simple string"'"

         'SETTEXTCOLOR-objectID,buttonNumber,color' - Sets the text color for the
               buttonNumber state of the object identified by objectID to
color.

            objectID - An identifier assigned to the object (button, gauge,
etc.)
               in PCDesign.  Valid values are in the range 1-65,535, inclusive.
            buttonNumber - Defines a button state.  For sliders and gauges the
1
               or ALL option should be used.
                  1 - Channel Off/Released
                  2 - Channel Off/Pushed
                  3 - Channel On/Released
                  4 - Channel On/Pushed
                  ALL - Applies to all four states
            color - See notes at end.

            Example
               SEND_COMMAND PCCOM,"'SETTEXTCOLOR-99,ALL,DKGREEN'"
               or
               SEND_COMMAND PCCOM,"'SETTEXTCOLOR-99,ALL,2'"
               or
               SEND_COMMAND PCCOM,"'SETTEXTCOLOR-99,ALL,(0,128,0)'"
               Sets the text color of the object identified as objectID 99 to
                  dark green for all four states.

         'SHOW-objectID' - Shows the object with the given objectID.

            objectID - An identifier assigned to the object (button, gauge,
etc.)
               in PCDesign.  Valid values are in the range 1-65,535, inclusive.
SHOW
               is the opposite of command HIDE.

            Example
               SEND_COMMAND PCCOM,"'SHOW-99'"
               Shows the object identified as objectID 99.

         'TRACKING-OnState,TrackingID' - Turns the specified tracking on or off.

            OnState - Changes the state of tracking. Valid values are ON and
                OFF.
            TrackingID - The type of tracking that is to be turned on or off.
                The valid values are as follows:
                PAGE  -  Turns on page tracking, whereby when the page
                         changes, a string is sent to the Master in the
                         format 'PAGE-<page name>'.
                WPAGE -  Turns on window/page tracking, whereby when there is
```

a window/page change, a string is sent to the Master in the format 'WPAGE-<window name>,<page name>'.

'WBKCOLOR-windowName,color' - Sets window windowName's background color to color. Note that the color will only be visible on the background if the page on top is Transparent and a window picture does not totally obscure the background.

windowName - The case sensitive name of a window.
color - See notes at end.

Example
SEND_COMMAND PCCOM,"'WBKCOLOR-PCTouch,YELLOW'"
or
SEND_COMMAND PCCOM,"'WBKCOLOR-PCTouch,15'"
or
SEND_COMMAND PCCOM,"'WBKCOLOR-PCTouch,(255,255,0)'"
Turns the window named "PCTouch" yellow.

'WBKPICTURE-windowName,picture[,position]' - Sets page windowName's background picture to picture and places the picture according to the optional position. Note that the picture will only be visible on the background if the page on top is Transparent.

windowName - The case sensitive name of a window.
picture - A picture name that is in the PTX file or the full path of a .BMP file. The tilde (~) will set the picture to none.
position - Specifies the position of text and pictures. For pictures, can also specify stretch-to position using the optional parameters starting at the hyphen (-). The spec for this parameter is: C|T|(L|C|R)(T|M|B)[-(L|C|R|N)[(T|M|B|N)]]where the values are defined as:
C - center, center in the space
T - tile, tile in the space
L|C|R - left or center or right, location of upper left corner x position
T|M|B - top or middle or bottom, location of upper left corner y position
N - none, used with stretch-to

Example
SEND_COMMAND PCCOM,"'WBKPICTURE-PCTouch,c:\win\amx.bmp,LT-RB'"
Sets the window "PCTouch"'s picture to the bitmap stored in the amx.bmp file in the c:\win directory. The picture is stretched to cover the

```
                window (from the Left-Top (LT) corner to the Right-Bottom (RB)
corner).

        'WCLOSE-[windowName]' - Closes window windowName.  If this is the last
of
                PCTouch's windows, then PCTouch itself closes.  If no windowName
is
                specified, all PCTouch windows (i.e. the application) will
close.

             windowName - The case sensitive name of a window.

             Examples
                SEND_COMMAND PCCOM,"'WCLOSE-Security'"
                   Closes the window "Security" .
                or
                SEND_COMMAND PCCOM,"'WCLOSE-'"
                   Closes the PCTouch application (all PCTouch windows).

        'WDISPLAY-windowName,displayID' - Displays window windowName according
to displayID.

             windowName - The case sensitive name of a window.
             displayID - Defines how a window should be displayed.
                SW_RESTORE - Restores a window.  Currently minimized windows are
set to
                   the last non-minimized state.  Currently maximized windows
are set to
                   the last non-maximized/non-minimized state.
                SW_SHOWMINIMIZED - Minimizes a window.
                SW_SHOWMAXIMIZED - Maximizes a window.

             Example
                SEND_COMMAND PCCOM,"'WDISPLAY-PCTouch,SW_RESTORE'"
                Restores the window "PCTouch" .  If the window was minimized or
maximized
                it is restored to its "normal" state.


        'WPAGE-windowName,pageName' - Changes the page in the window, a page
flip. If the
                window is minimized, it is restored, not recreated.  If the
window does
                not exist, it is created.

             windowName - The case sensitive name of a window.
             pageName - The case sensitive name of a page.

             Example
                SEND_COMMAND PCCOM,"'WPAGE-PCTouch,MAIN PAGE'"
                Page flips MAIN PAGE into window "PCTouch".



********************************************************************************
**
    Supported TouchPanel Commands:
```

"'!T',<variable text address 1-255>,'<new text to be put in button>'"
   shorthand and faster version of 'TEXT' command
'TEXT<variable text address 1-255>-<new text to be put in button>'
   changes text in specified text button number. All text is
   centered in the box. A '|' character indicates a carriage
   return to begin next line down. All text remains permanent
   even during power outage until changed with another TEXT
   command or the panel editor
   Example of usage:

    'TEXT2-VCR|PLAY' changes text button number 2 to display:

```
 ------
| VCR  |
| PLAY |
 ------
```

   [PCTOUCH APP NOTES:]
   [1. The variable text address is the objectID.   ]
   [2. The text is set for ALL states or buttonNumbers   ]
   [1 - Channel Off/Released,   2 - Channel Off/Pushed   ]
   [3 - Channel On/Released,   4 - Channel On/Pushed   ]

'PAGE-<page name>' flips to page with specified page name
   Example of usage:
     'PAGE-MAIN' flips to a page named MAIN on the panel

   [PCTOUCH APP NOTE:]
   [The first available window will be used. Therefore, for   ]
   [the most predictable behavior, the PTX file should only   ]
   [contain one Window.   ]

'TPAGEON' turns on page tracking, whereby when the page changes,
   a string is sent to the Master in the format 'PAGE-<page name>'.
   This string may be captured with a CREATE_BUFFER command for
   one panel and sent directly to another panel because it is in
   the format of a 'PAGE-' command

   Example of usage:

```
  DEFINE_VARIABLE
    TP1_BUF[25]
  DEFINE_START
    CREATE_BUFFER TP1,TP1_BUF
  DEFINE_PROGRAM
  IF(LENGTH_STRING(TP1_BUF))  (* See if we got string from TP1 *)
    {
    SEND_COMMAND TP2,TP1_BUF  (* Make TP2 page track TP1 *)
    TP1_BUF=''  (* Clear string buffer *)
    }
```

   [PCTOUCH APP NOTE:]
   [If the PTX file contains more than one window, the TRACKING   ]
   [SendCommand should probably be used.   ]
                                                                    ]
'TPAGEOFF' turns off page tracking
'BEEP' outputs a beep
'ABEEP' outputs a beep duration 1 even if beep is off
'DBEEP' outputs a double beep
'ADBEEP' outputs a double beep even if beep is off

   [PCTOUCH APP NOTE:]

[All the beeps will be the Default Beep (or MB_OK). For]
[more control use the PCTouch BEEP or PLAYSOUND SendCommands.]

'AKEYB-<inital text>' pops up the keyboard icon and initializes the text string to that specified. Keyboard string is set to null on power up and is stored until power is lost.

'AKEYP-<inital text>' pops up the keypad icon and initializes the text string to that specified. Keypad string is set to null on power up and is stored until power is lost.

'AKEYR-' Removes any displayed keypad or keyboard

'PKEYP-<inital text>' (Private Keypad) pops up the keypad icon and initializes the text string to that specified. Keypad displays a '*' instead of the numbers typed.

****
**

Supported Floppy Disk Drive Commands:

'DEL <DOS filename>' deletes filename from disk. If file does not exist, channel 20 is PUSHed and RELEASEd.
'DIR' reads and sends the list (directory) of files that are on the disk (as strings)
'OPEN <DOS filename>,R|W|A,<file# 1-16>' opens the specified filename for (R)eading,(W)riting, or (A)ppend. All future references up until the file is closed will use the specified file#. If attempting to open a file for read that does not exist, then channel 20 is PUSHed and RELEASEd. When a file is opened for Writing, if it does not exist, it is created-if it does exist, the file length is set to zero bytes. When a file is opened for Append, if it does not exist, it is created-if it does exist, a seek to the end of the file is executed and any writes to the file are added at the end. Both button LEDs are on if any files are open.
'CLOSE <file#>' closes the specified file
'CLOSEALL' closes all files that are open
'READ <file#>,<number of bytes>' reads and sends the specified number of bytes from the specified file (as a string). If an end of file (EOF) is encountered, then channel <file#> is PUSHed and RELEASEd
'READLN <file#>' reads and sends one line of text from the specified file (as a string). A line of text ends in a carriage return (decimal 13), a line feed (decimal 10), or a combination both carriage return and line feed. If an end of file (EOF) is encountered, then channel <file#> is PUSHed and RELEASEd
'SEEK <file#>,<which byte number>' seeks to the specified byte number (position) in the specified file. If a seek past the end of the file is attempted, then channel <file#> PUSHed and RELEASEd
'WRITE=<file#>' sets the current next file to be written to when strings are received. An 'OPEN' for write command automatically sets the next file to be written to that opened. If writing and the disk becomes full, channel <file#> is PUSHed and RELEASEd

If during any of the above commands the disk drive has problems

accessing the disk (because disk is not present, bad disk, wrong format, etc), then channel 20 is PUSHed and RELEASEd quickly to indicate an error

>> Use the SEND_STRING instruction to send bytes (characters) to the floppy disk for writing. Use a CREATE_BUFFER instruction to receive bytes (characters) from reading the floppy disk (or requesting the directory)

****
**

Notes:

color - "Standard" Windows colors or an index or an RGB triplet in parenthesis where each color can be between 0 and 255. For example, RED can also be represented by an index of 13 or the RGB triplet (255,0,0). The possible values are shown in the following table.

Name	Index	(R,G,B) triplet
BLACK	0	(0,0,0)
DKRED	1	(128,0,0)
DKGREEN	2	(0,128,0)
DKYELLOW	3	(128,128,0)
DKBLUE	4	(0,0,128)
DKMAGENTA	5	(128,0,128)
DKCYAN	6	(0,128,128)
LTGRAY	7	(192,192,192)
MONEYGREEN	8	(192,220,192)
SKYBLUE	9	(164,200,240)
CREAM	10	(255,251,240)
MDGRAY	11	(160,160,164)
DKGRAY	12	(128,128,128)
RED	13	(255,0,0)
GREEN	14	(0,255,0)
YELLOW	15	(255,255,0)
BLUE	16	(0,0,255)
MAGENTA	17	(255,0,255)
CYAN	18	(0,255,255)
WHITE	19	(255,255,255)

or any (r,g,b) value.

PRODIGY Lighting Dimmer

COMMANDS: None

SEND_STRINGS:

Symbols:
<n> - Dimmer Number
<m> - Level in %
<c> - Curve Value
<p> - Pack Number
<s> - Preset Number
<t> - Fade Time in seconds
<CR> - Carriage Return (decimal 13 or hex 0D)

```
A  - ALL designator
B  - Recall Preset Command
C  - Status Request
D  - DOWN designator
L  - Level Command
LT - Level Time Command
P  - Preset Command
PT - Preset Time Command
R  - Record Preset Command
RT - Ramp Time Command
S  - Stop Ramp Command
U  - Undefine Command
     or
     UP designator

Curves:
1  - Standard Dimming Curve
2  - Economy Dimming Curve
F  - Always ON Curve
N  - Non-Dim Curve
O  - Always OFF Curve
/  - Set Curve Delineator

Examples:

Goto a Level  <n>L<m><t><CR>

               2L88<CR>         Dimmer 2 Level 88%
               ALU<CR>          ALL Level Undefined
               1-4&6-8L88<CR>   1,2,3,4,6,7,8 Level 88%
               AL0<CR>          ALL Level 0%
               1L50T5<CR>       Dimmer 1 Level 50% in 5 sec.

Ramp Dimmer   <n><command><t>   Start Ramp
              <CR>              Stop  Ramp
                      or
              <n>S<CR>          Stop Dimmer n Ramp

               1U               Dimmer 1 Ramps Up
               1S<CR>           Stop Dimmer 1 Ramp

               AU               ALL Ramp Up

Record Preset <s>R<t><CR>

               3R<CR>           Record Preset 3
               1R5<CR>          Record Preset 1,5 second fade

Recall Preset <s>B<t><CR>

               2B<CR>           Recall Preset 2
               5B2<CR>          Recall Preset 5,2 second fade

Set a Curve   <n>/<c><CR>

               1/1<CR>          Dimmer 1 standard dim curve
               1-8/N<CR>        1 through 8 non-dim curve
```

```
Set Level Time LT<t><CR>

               LT1<CR>         Level Time 1 sec

Set Ramp Time  RT<t><CR>

               RT5<CR>         Ramp Tme 5 sec

Set Preset Ramp Time PT<t><CR>

               PT3<CR>         Preset Ramp 3 sec

Ramp a Preset  P<command>

               PU              Ramp Current preset UP
               PD              Ramp Current preset Down
               <CR>            Stop Ramping Preset

Request dimmer Status <n><CR>

               1<CR>           Request Dimmer 1 Status
      Returns
               PACK1:CURVE<c>:LEVEL<m><CR>

Request Pack Status <p>C<CR>

               1C<CR>           Request Pack 1 Status
               AC<CR>           Request ALL Pack Status
```

---

63 RADIA Lighting System

63.1 CHANNELS

CHANNEL	FUNCTION
1 - 128	Status of preset 1-128 (feedback only)
129	Ramp dimmer 1 up
130	Ramp dimmer 2 up
131	Ramp dimmer 3 up
132	Ramp dimmer 4 up
133	Ramp dimmer 5 up
134	Ramp dimmer 6 up
135	Ramp dimmer 1 down
136	Ramp dimmer 2 down
137	Ramp dimmer 3 down
138	Ramp dimmer 4 down
139	Ramp dimmer 5 down
140	Ramp dimmer 6 down
141	Ramp all channels up
142	Ramp all channels down
143	Turn all channels fully on
144	Turn all channels fully off
145	Ramp active preset up
146	Ramp active preset down
147 - 154	Status of dry closures 1 - 8 (feedback only)
155	All level undefine

63.2 COMMANDS

(SEND_COMMAND DEV,"command")

```
            <n> = dimmer number 1 - 252
            L = level setting command
            <m> = dimmer level percentage 0 - 100
            <t> = fade time 0 -255 (seconds) T<t> is optional

         'LT<t>'
            LT = level time command  Default Level time, if none
                 specified in level commands
            <t> = fade time 0 - 255 (seconds)

         'PT<t>'
            PT = preset time command   Default preset time, if none
                 specified during a preset record
             <t> = fade time 0 - 255 (seconds)

         'RT<t>'
            RT = ramp time command      Default ramp time
            <t> = fade time 1 -255 (seconds)

         'SP<s>T<t>'
            SP = store preset command
            <s> = preset number 1 - 128
            T = time command  T<t> is optional. 'PT<t> time is used if not
pecified
            <t> = fade time 0 - 255 (seconds)
```

'RP<s>'
RP = recall preset command
<s> = preset number 1 - 128

'LEVON'
Set reporting levels on

'LEVOFF'
Set reporting levels off

'RXON' - Strings will be send from RADIA to the master. This is sent automatically when CREATE_BUFFER is used.

'RXOFF' - Do not send strings to Axlink master.

SEND_STRINGs:

Radia uses SEND_STRINGs for control

RADIA PROlink Command Structure:

VARIABLES

SYMBOL		FUNCTION	VALUE	REFERENCE
/	=	Set Curve delineator		Set a Curve.
< c >	=	Value for Curve	1,2,3,4, N,O,F	Set a Curve.
< cl >	=	Value for Dry Closure	1 - 8	Disable Dry Closure. Enable Dry Closure. Set External Dry Closure.
< m >	=	Value for Dimmer Level (in %)	0 - 100	Set Dimmer Level. Set Group Levels.
< n >	=	Value for Dimmer Number	1 - 252	Ramp Dimmer(s). Request Dimmer Status. Set a Curve. Set Dimmer Level. Stop Ramping. Undefine Dimmer(s).
< p >	=	Value for Pack Number	1 - 42	Disable Dry Closure. Enable Dry Closure. Request Pack Level Status. Request Pack Status. Set External Dry Closures.
< s >	=	Value for Preset Number (special functions 253, 254, 255)	1 - 128	Recall a Preset. Record a Preset. Set External Dry Closure.
< t >	=	Value for Fade Time in Seconds	0 - 255	Recall a Preset. Record a Preset. Set Default Level Time.

		Set Default Preset Time. Set Default Ramp Time. Set Dimmer Level. Set Group Level.

PROlink COMMANDS ARE CASE SENSITIVE.
USE ALL CAPS FOR COMMANDS

SYMBOL	FUNCTION	REFERENCE
1	Standard Dimming Curve	Set a Curve.
2	Economy Dimming Curve	Set a Curve.
3	0-10 VDC; Advance MK7	Set a Curve
4	0-12 VDC; Prescolite	Set a Curve
5	Lutron FDB	Set a Curve
6	Advance Mark VII	Set a Curve
7	12% roll off	Set a Curve
8	19% roll off	Set a Curve
9	33% roll off	Set a Curve
A	s-curve	Set a Curve
B	VDR Curve	Set a Curve
C	VDR Curve	Set a Curve
D	VDR Curve	Set a Curve
A	ALL Designator	Ramp Dimmer (s). Request Pack Status. Request PROlink Status. Set a Curve. Set Group Level. Stop Dimmer(s) Ramping. Undefine Dimmer Levels.
B	Recall Preset Command	Recall a Preset.
C	Return CURVE Status only	Request PROlink Curve Status. Request Pack Curve Status.
D	DOWN Designator	Ramp Dimmer(s). Ramp Active Preset.
E	External Designator	Set External Dry Closure.
F	(always) ON Curve	Set a Curve.
L	Level Command	Set Dimmer Level.

		Set Group Level.
LE	Low End command	Set minimum on turn on level
LT	Set Default LEVEL time	Set Default Level Time.
LU	Undefine Command	Undefine Dimmer(s) Level.
M	FDB master curve	Set a Curve.
N	Non-Dim Curve	Set a Curve.
O	(always) OFF Curve	Set a Curve.
P	Preset Command	Ramp Active Preset. Set External Dry Closure.
PT	Set Default Preset Time	Set Default Preset Time.
R	Record Preset	Record Preset.
RF	Set RXOFF Mode	Set RXOFF Mode.
RN	Set RXON Mode	Set RXON Mode.
RT	Set default Ramp Time	Set Default Ramp Rate.
S	STOP Command	Stop Dimmer(s) Ramping. Stop Preset Ramping.
S	FDB Slave Curve	Set a Curve.
T	TIME	Set Dimmer Level Set Group Level
U	UP Designator	Ramp Active Preset. Ramp Dimmer(s).
XN	PUSH Dry Closure Command	Enable Dry Closure.
XO	RELEASE Dry Closure Command	Disable Dry Closure.
Z	Return LEVEL STATUS only	Request PROlink Level Status. Request Pack Level Status.

Send_String COMMANDs		USE and EXAMPLES
Disable Dry Closure	<p>XO<cl><enter>	
	1XO1<enter>	Disable Dry Closure 1 on Pack 1.
	42XO8<enter>	Disable Dry Closure 8 on Pack 42.
Enable Dry Closure	<p>XN<cl><enter>	
	1XN1<enter>	Enable Dry Closure 1 on

```
                                Pack 1.
                        42XN8<enter>    Enable Dry Closure 8 on
                                        Pack 42.

Ramp Dimmer (s)         <n><command>

                        1U              Ramp Dimmer 1 Up.
                        2-4&7-9D        Ramp Dimmers 2 through 4 and 7
                                        through 9 Down.
                        AU              Ramp All Dimmers on PROlink Up.
                        <enter> will stop ramping

Ramp Active Preset      PD              Ramp currently selected
                                        Preset Down.
                        PU              Ramp currently selected
                                        Preset Up.
                        <enter> will stop ramping

Recall a Preset         <s><B><t><enter>

                        2B              Recall Preset 2
                                        (at default rate).
                        128B            Recall Preset 128
                                        (at default rate).
                        56B5            Recall Preset 56 with a 5
                                        Second Fade Rate.

Record a Preset         <s><R><t><enter>

                        3R              Record Dimmer Levels as Preset 3
                                        (at default rate).
                        128R5           Record Dimmer Levels as Preset
128
                                        with a 5 Second Fade Rate.

Request Dimmer Status   <n><enter>

                        1<enter>        Request Status of Dimmer 1.
                                        Only one Dimmer can be selected
                                        at a time.

Request Pack Level Status
Request PROlink Level Status
                        <p>Z

                        1Z              Request Level Status of
                                        Pack 1.
                        42Z             Request Level Status of
                                        Pack 42.
                        AZ              Request Level Status of
                                        PROlink.
                                        Only one Pack can be
                                        selected at a time.
        EXAMPLE: 1Z returns on PROlink:  aP01:00,00,00,00,00,00
                                        Pack does not indicate
                                        UNDEFINED status on Level
                                        request.
```

```
Request Pack Curve Status
Request PROlink Curve Status
                        <p>C<enter>

                        1C              Request Full Curve Status of
                                        Pack 1.
                        42C             Request Full Curve Status of
                                        Pack 42.
                        AC              Request Full Curve Status of
                                        PROlink.
                                        Only one Pack can be selected
                                        at a time.
         EXAMPLE: 1C returns on PROlink:  aP01:1,1,1,1,1,1

Set a Curve             <n>/<c>

                        1/1             Set Dimmer 1 to Curve 1.
                        1-8/N           Set Dimmers 1 through 8
                                        to Curve N.
                        A/1             Set All Dimmers to Curve 1.

Level reporting on      'LN',<enter>

                         LN = set LEVON mode
         Example: SEND_STRING Radia,"'LN',13"
                 Sets Radia MC/MC6 to LEVON mode.
         The Radia system will return the
         response like:
         LEVON MODE

Level reporting off      'LF',<enter>

                         LF = set LEVOFF mode
         Example: SEND_STRING Radia,"'LF',13"
                 Sets Radia MC/MC6 to LEVOFF mode.
                 The Radia system will return the
                 response like:
                 LEVOFF

Set Default Level Time  LT<t><enter>

                        LT3             Set Default Level Time
                                        to 3 Seconds.
                        LT0             Set Default Level Time
                                        to instant on/off.

Set Default Preset Ramp Time
                        PT<t><enter>

                        PT4             Set Default Preset Time to
                                        4 Seconds.
                        PT1             Set Default Preset Time to
                                        1 Second.

Set default Ramp time   RT<t><enter>
```

	RT5	Set Default Ramp Time to 4 Seconds.
	RT200	Set Default Ramp Time to 200 Seconds
Set Dimmer Level or Set Group Level	<n>L<m>T<t><enter>	
	2L88	Set Dimmer 2 to Level 88 (default time).
	1-4&6-8L99	Set Dimmers 1 through 4 and 6 through 8 to Level 99 (default time).
	6L100T5	Set Dimmer 6 to Level 100 with a 5 Second Ramp Time.
	ALU	Set All Levels Undefined (default time).
	AL0	Set All Levels to 0 (default time). Only one Dimmer Level can be set at a time.
Set External Dry Closures	<p>E<cl>P<s><enter>	
	1E1P128	Set Pack 1, Dry Closure 1 to Recall Preset 128.
	1E8P255	Set pack 1, Dry Closure 8 to Ramp Selected Preset Down.
	42E1P10	Set pack 42, Dry Closure 1 to Recall Preset 10. Only one External Dry Closure can be set at a time.
Set RXOFF Mode	RF<enter>	
Set RXON Mode	RN<enter>	
Stop Dimmer(s) Ramping	<n>S<enter> also <enter> will stop ramping	
	1S	Stop Ramping Dimmer 1.
	1-6S	Stop Ramping Dimmers 1 . through 6.
	AS	Stop Ramping All Dimmers.
Stop Preset Ramping	PS<enter>	Stop Ramping Preset.
Undefine Dimmer(s)Level	<n>LU<enter>	
	ALU	Set All Dimmers to Undefined Level.
	1LU	Set Dimmer 1 to Undefined Level.
	5-33LU	Set Dimmers 5 through 33 to Undefined Level.

	Pack does not indicate UNDEFINED status on Level request.

CURVES

Symbol	Description
1	Standard Dimming Curve
2	Economical Dimming Curve
3	0-10 VDC Curve for Advance MK7, Motorola Helios
4	0-12 VDC Curve for Prescolite Intelect
5	Lutron FDB
6	Advance Mark VII
7	12% roll off
8	19% roll off
9	33% roll off
A	s-curve
F	Always ON Curve
M	FDB Master Curve (Radia only) Used for RADIA RAD-FDB modules Used for RADIA FDB Mode; channels 1 & 3,5, and 6 only
N	Non-Dimming Curve
O	Always OFF Curve
S	FDB Slave Curve Used for RADIA FDB Mode; channels 2 & 4 only

PRESETS & Special Functions

1-128	Standard Preset Storage Locations (Feedback only) \
253	Preset Record Enable Function
254	Preset Ramp UP Function
255	Preset Ramp DOWN Function

---

64 VTI6 Video Text Interface

64.1 COMMANDS

(SEND_COMMAND DEV,”command”)

```
      General Commands:

        *  'CLOCK mm-dd-yy hh:mm:ss' sets the time and date
           on the VTI-6 master and slaves.

           Example of usage:
           'CLOCK 01-08-93 19:16:00' sets the time to 7:16 PM and date
           to January 8, 1993

        *  'RESET'  initializes the VTI-6 master and slaves.


      Protocol Commands:

          ATTENTION BYTE = '!'  FOR COMMAND

          <ATTENTION BYTE> <CHANNEL> <COMMAND TYPE> <COMMAND> <DATA>

          Valid channels are 0-96.  The master VTI-6 is channels 1-6.
          Slave 1 is 7-12, etc.

          Channel 0 is a global command. The command is done on all channels
          on every VTI-6 in the chain.

    Commands:

      /*-----------------------------------------------*/
      COMMAND TYPES
        1 - MEDIA COMMANDS
        2 - TIME COMMANDS
        3 - STOP WATCH
        4 - GENERAL TEXT PAGES
        5 - BASIC TEXT LINE
        6 - SETUP COMMANDS


      /*-----------------------------------------------*/
      MEDIA COMMANDS-
        1 - SET DESC LINE 1
        2 - SET DESC LINE 2
        3 - SET DESC LINE 3
        4 - SET FUNCTION LINE, default
        5 - SET MEDIA FIELD START LINE, default 1
          6 - SET MEDIA TIMEOUT         data <SECONDS 1-254>  default 5
        7 - RECALL MEDIA
          8 - DISPLAY CLOCK ON MEDIA - ON, DEFAULT
          9 - DISPLAY CLOCK ON MEDIA - OFF,

      EXAMPLES:
      SET DESCRIPTION LINE 1:
```

```
  "'!',1,1,1,'HELLO'"
SET DESCRIPTION LINE 2:
    "'!',1,1,2,'BYE BYE'"
SET FUNCTION LINE:
    "'!',1,1,4,'PAUSE'"
SET START MEDIA LINE:
    "'!',1,1,5,8"              /*  Display starts on line 8 */
SET MEDIA TIMEOUT:
    "'!',1,1,6,5"              /*  5 second timeout */

/*-----------------------------------------------*/
TIME COMMANDS-
  1 - SET TIME
  2 - SET DATE
  3 - SET TIME DATE LINE, default 5
  4 - TIME ON
  5 - TIME OFF

EXAMPLES:
SET TIME:
    "'!',1,2,1,'18:00:00'"    /* HH:MM:SS 6:00 pm */
SET DATE:
    "'!',1,2,2,'05-01-94'"    /* MM-DD-YY May 1, 1994 */
SET TIME DATE LINE:
    "'!',1,2,3,6"             /* Time Date displayed on line 6 */
TIME ON:
    "'!',1,2,4"
TIME OFF:
    "'!',1,2,5"

/*-----------------------------------------------*/
STOP WATCH COMMANDS-
  1 - SET STOP WATCH AUTOMATICALLY PAUSES STOP WATCH
  2 - SET STOP WATCH LINE, default 6
  3 - START
  4 - PAUSE
  5 - REMOVE

EXAMPLES:
SET STOP WATCH:
    "'!',1,3,1,'01:00:00'"    /* HH:MM:SS  1 hr  */
SET STOP WATCH LINE:
    "'!',1,3,2,6"             /* Stop Watch displayed on line 6 */
START:
    "'!',1,3,3"
PAUSE:
    "'!',1,3,4"
REMOVE:
    "'!',1,3,5"

/*-----------------------------------------------*/
  GENERAL TEXT PAGES -
  1 - SET LINE ON PAGE
  2 - CLEAR PAGE FROM MEMORY
  3 - DISPLAY PAGE
  4 - PAGE RANGE
  5 - NEXT PAGE
```

```
  6 - PREVIOUS PAGE
    7 - NEXT PAGE AUTO CHANGE TIME (PAGE DWELL TIME). <SECONDS 0-254>
    Note: A data value of <0> (default) will disable automatic
        page flips.
  8 - PAGE DISPLAY OFF.
    9 - CLOCK ON TEXT PAGES ON
   10 - CLOCK ON TEXT PAGES OFF  (default)

EXAMPLES:
SET LINE 1 ON PAGE 1:
    "'!',1,4,1,1,1,'This is line 1'"

  /* '!',<CH 1>,<GENERAL TEXT PAGE>,<SET LINE>,<PAGE>,<LINE>,<TEXT> */

CLEAR PAGE 2:
    "'!',1,4,2,2"

  /* '!',<CH 1>,<GENERAL TEXT PAGE>,<CLEAR PAGE>,<PAGE> */

SHOW PAGE 1:
    "'!',1,4,3,1"

/* '!',<CH 1>,<GENERAL TEXT PAGE>,<SHOW PAGE>,<PAGE> */

PAGE RANGE:
    "'!',1,4,4,'1,3-5'"

  /* '!',<CH 1>,<GENERAL TEXT PAGE>,<PAGE RANGE>,
     <ENABLE PAGES 1 AND 3-5> */

NEXT PAGE:
    "'!',1,4,5"

/* '!',<CH 1>,<GENERAL TEXT PAGE>,<NEXT PAGE> */

PREVIOUS PAGE:
    "'!',1,4,6"

/* '!',<CH 1>,<GENERAL TEXT PAGE>,<PREVIOUS PAGE> */

PAGE DWELL TIME:
    "'!',1,4,7,30"

/* '!',<CH 1>,<GENERAL TEXT PAGE>,<PAGE TIME>,<DISPLAY FOR 30 SEC> */

  Note: Dwell time of 0 will disable automatic page flips.
        Pages flip to next page, not previous page.

/*---------------------------------------------*/
BASIC TEXT LINE
  1 - LINE OF TEXT       data = <line> 'text'
  2 - SIZE LINE OF TEXT  data = <line>,0-3
                  0 - 1x
                  1 - 2x
                  2 - 3x
                  3 - 4x
    3 - LINE,COLUMN,TEXT    data <line (1-12)>,<column (1-24)>,<'text'>
```

```
/*-----------------------------------------------*/
SETUP COMMANDS -
                        Background / Border
  1 - CHAR COLOR   data  0  - Black    None
                     1  - Black        Fringe
                   2  - Black    Square
                   3  - Blue           None
                           4  - Blue         Fringe
                           5  - Blue         Square
                           6  - Green        None
                           7  - Green        Fringe
                           8  - Green        Square
                           9  - Red    None
                           10 - Red    Fringe
                           11 - Red    Square
                           12 - White        None
                           13 - White        Fringe
                           14 - White        Square
                   default 4

  2 - BLINK RATE    data  0 - None
                    1 - 1:3
                    2 - 3:1
                    3 - 1:1

  3 - VIDEO vs INTERNAL   data  0 - External
                          1 - Internal
                    default 0


  4 - HORIZONTAL OFFSET   data  0-31      default 6
  5 - VERTICAL OFFSET     data  0-31      default 3
  6 - CLEAR DISPLAY
  7 - DISPLAY ON
  8 - DISPLAY OFF
    9 - LINE,COLUMN,TEXT    data <line (1-12)>,<column (1-24)>,<'text'>
   10 - AUTO SCREEN CLEARS ON  (default)
   11 - AUTO SCREEN CLEARS OFF

/*-----------------------------------------------*/


RS-232 Protocol:

  The RS-232 is identical to the AXLINK SEND_COMMANDS with the
  addition of a delimiter byte.  A byte of value 255 is added to the
  end of all commands.

  DELIMITER = <255>

EXAMPLES:

  AXLINK PROTOCOL:

          SET DESCRIPTION LINE 1:
          "'!',1,1,1,'HELLO'"
```

RS-232 PROTOCOL:

SET DESCRIPTION LINE 1:
"'!',1,1,1,'HELLO',255"

Note: This includes the 'CLOCK' and 'RESET' commands.