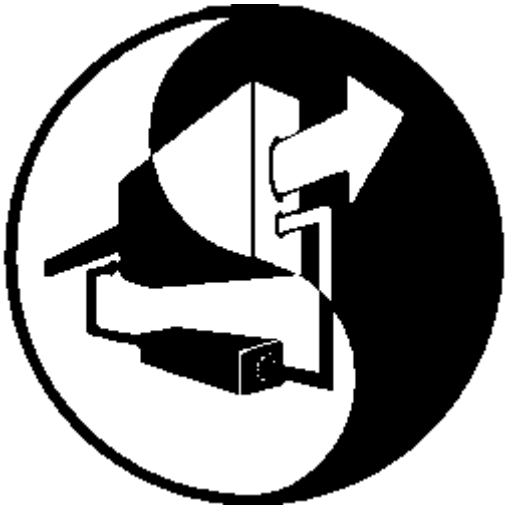
CyberCom



Com Port Console

(Win9x/NT version)

Provides Com Port Communication for Cybernetic Micro Systems' Controller Chips and Prototyping Boards

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CyberCom

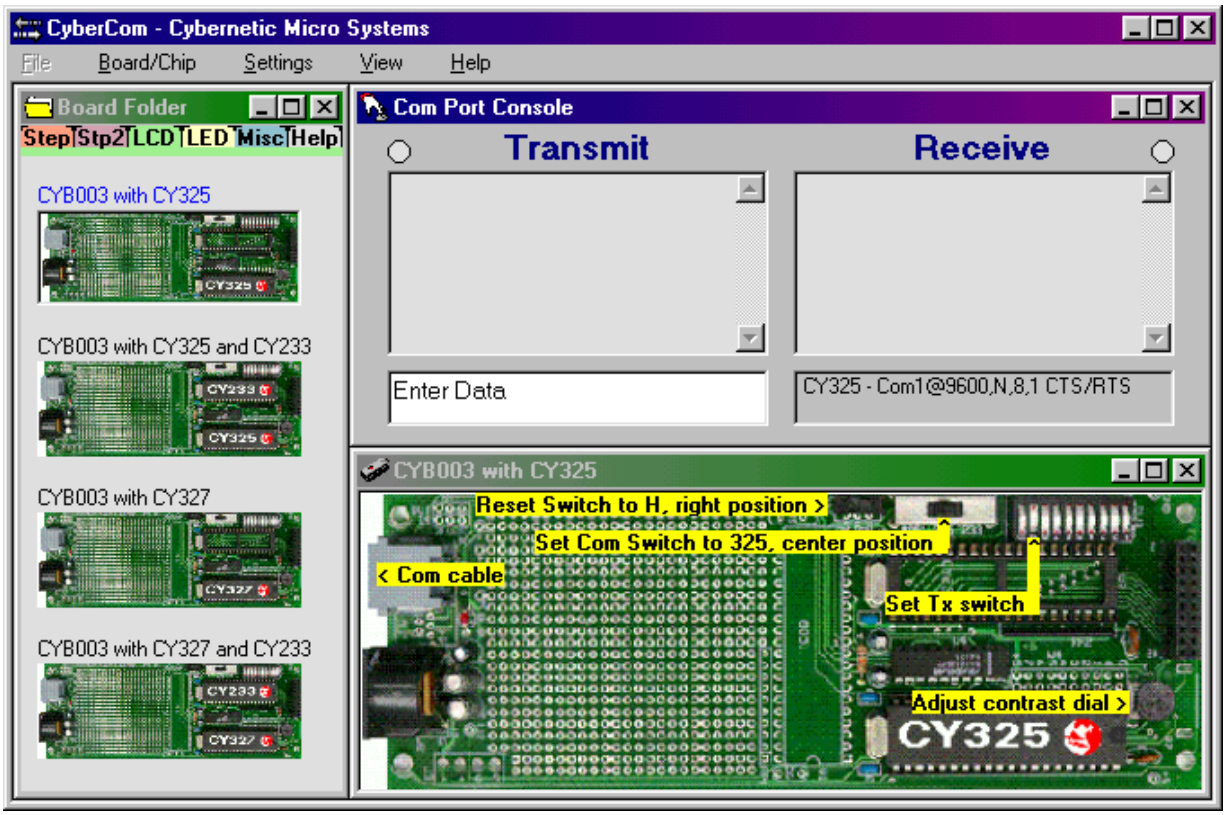
Com Port Console

(Win9x/NT version)

Provides Com Port Communications for
Cybernetic Micro Systems'
Controller Chips and Prototyping Boards

Overview

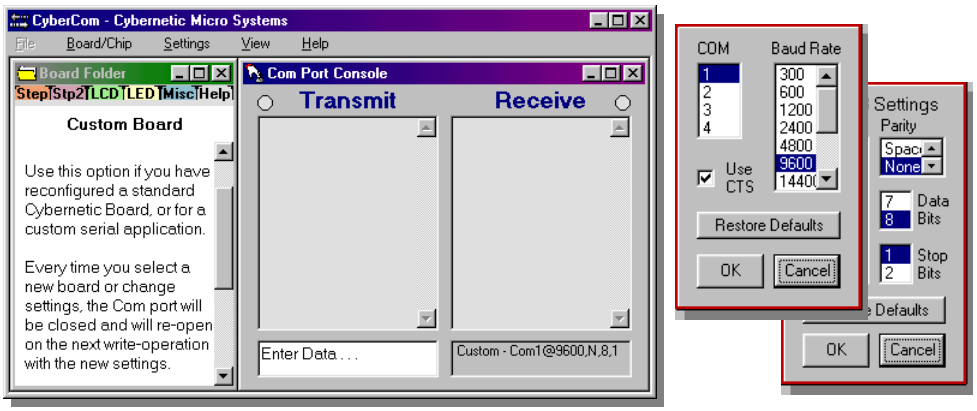
CyberCom is a software console for typing data directly to hardware that is connected to the Com port of a PC. The program provides numerous default Com settings for Cybernetic Boards and allows reconfiguration of various Com port settings for custom applications.



Most of Cybernetic's Control ICs have TTL serial data lines; and all can be connected to Cybernetic's CY233, which acts as a serial node for networking multiple devices on a single Com port. Cybernetic's Prototyping Boards implement this serial capability with RS232 transceivers, so the boards can be connected directly to the PC's serial port.

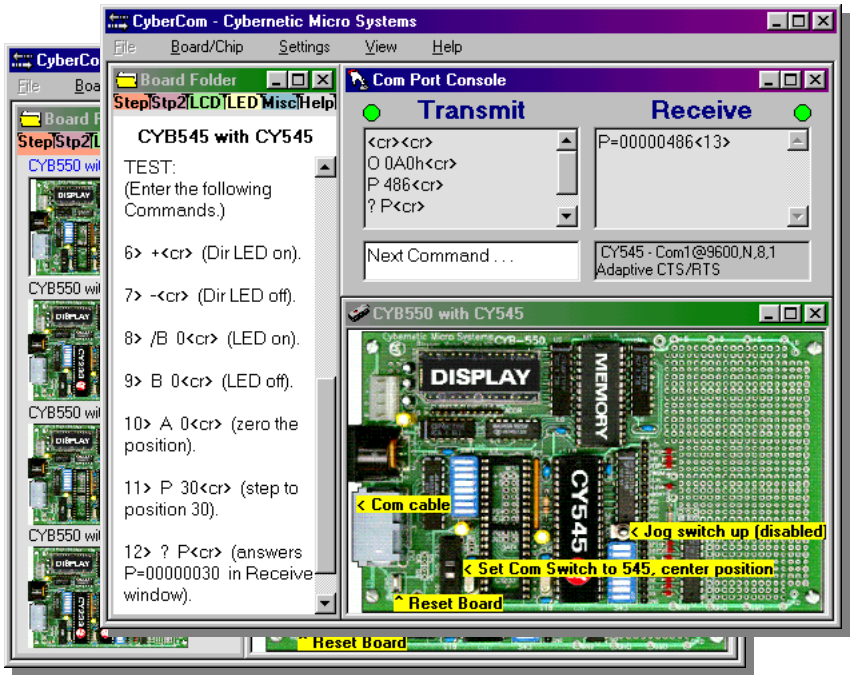
CyberCom automatically sets up the communications protocol for each type of board and chip. It provides a picture of each prototyping board with the selected control IC that will be the target of the serial communications. Setup tips and switch and jumper settings are pictorially depicted and sample test sequences are suggested.

A customization option allows the user to configure the Com port to suit any modifications to the Cybernetic board or to support custom applications. The default startup setting is Com1, CTS off, and 9600,n,8,1, ASCII data.



Screen Layout

The screen is divided into three panels:



The main data entry **Console** accepts typed input, and displays the data sent to, and received from, the Com port. Status lights provide a visual cue to Com port performance. The console also displays the current board settings.

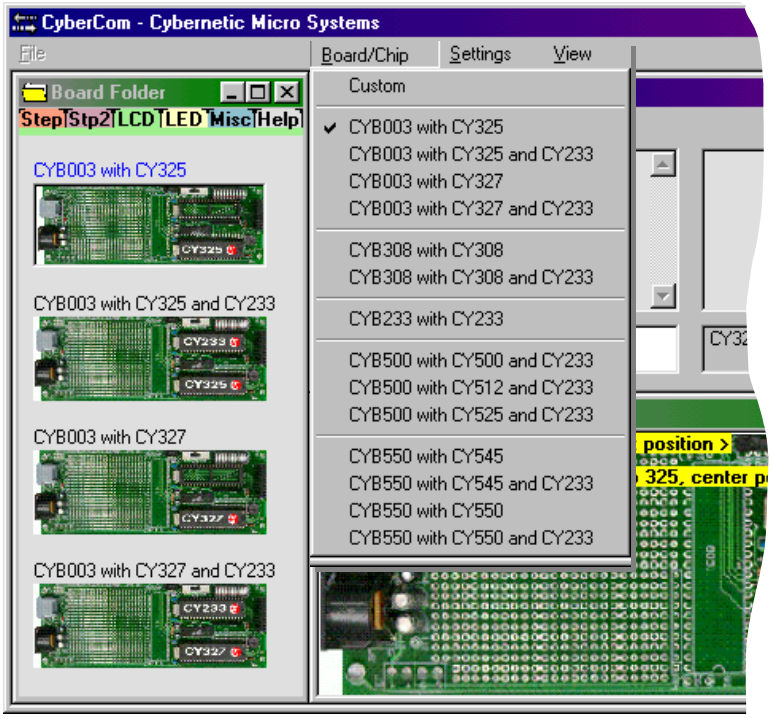
The **Board** display provides a blown up image of the selected board, with important features and settings highlighted. Clicking the image will cause the notes to toggle on and off.

The Board **Folder** groups the boards by function and gives the user a visual alternative to the alphabetical Board list. It also includes board-testing tips within the Help tab.

Board selection, Com settings, Panel layout, and the User manual are available from the drop-down **Menus**.

Board and Chip Selection

The process begins with selecting a predefined board/chip combination from either the drop down Menu or from the Board Folder. From the Menu, select Board/Chip category and select the target board. Or from the Board Folder, select the category tab, and then click on the appropriate board image.



Selecting a board will load the board's image and Com port settings.

A practice run is appropriate on the first use. After selecting a board, simply cancel all the pop-ups, where allowed, to avoid writing to the Com port. When loading is complete, compare the image and notes to your board. When satisfied that your system is ready, select the board again and proceed though the pop-ups.

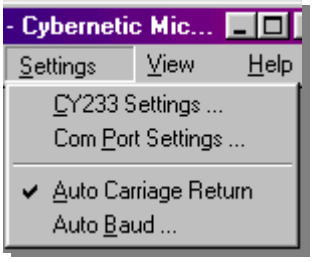
You will be presented with CY233 settings, if appropriate, and with the Com port options. The settings are configured for the board defaults, and items that are hardwired on the board are grayed out and can not be changed. (If you have modified your board's Com settings, then use Custom rather than a predefined board option.) These two groups of settings do not touch the Com port until the next write operation. If appropriate to the board, you may be given the option to activate Auto Baud. Most Cybernetic chips have an adaptive baud option, where the device will adapt to the Com port baud rate after receiving two carriage returns. This option will write to the Com port unless canceled. *All these selections are also available from the Menu under Settings.*

Once a board is selected and the Com settings are confirmed, the program will display the board image and the startup checklist for that board. You should confirm your physical board configuration (jumpers and switches) matches that shown in the picture.

After confirmation, follow the instructions in the checklist to communicate with the board. Once proper communications have been established, refer to the user manual for additional commands for your chip. (A quick command reference is also provided in this document's appendix.)

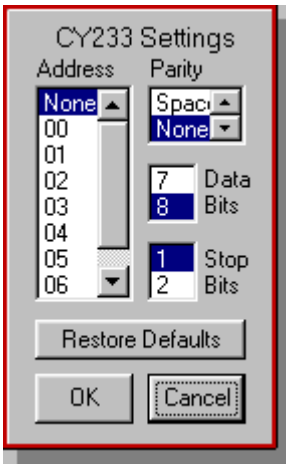
Each time a new board is selected, the Com port will be closed and new Com parameters will be loaded. If you select a new board while your Com port is open, you will receive a warning message and will have the option to cancel the load. If canceled, your screen will revert back to the active board and your Com settings will remain unchanged.

Communications Settings



Communications options are provided in the Settings section of the menu. Predefined settings are loaded with each board, and are presented to the user for changes after loading. Not all options will be available, depending on the currently selected board. The only time all options are available is when the Custom board is selected. Note that loading ANY board type will close the Com port in anticipation of changing these settings.

CY233 Settings



Address

The CY233 has an addressable mode so that multiple devices (up to 255) can share a single Com port. This program allows up to eight addresses (decoded mode) for the CY233. When an address is selected, every Write operation to the Com port will be preceded by the selected CY233 address, as appropriate. If no CY233 is used, or if full CY233 command features are desired, select None.

Parity

The most common Com port data parity option is "None", and that is what is used by all the Cybernetic chips. However, the CY233 has the flexibility to use any parity option: Mark, Even, Odd, Space, or None; and therefore those options are present.

Data Bits

Most hardware connected to the Com port will use 8-bit data. All of the included Cybernetic devices will tolerate or support 8-bit data. Since the CY233 can be set to 7-bit or 8-bit mode, both options are available.

Stop Bits

One Stop bit is standard. Two stop bits are used only at the slowest baud rates (300 and under), and so are irrelevant to most applications. The option is included because the CY233 supports it.

Restore Defaults

Clicking the Defaults button returns the settings to the predefined defaults for the displayed board type. The settings will be used when the OK button is subsequently pressed.

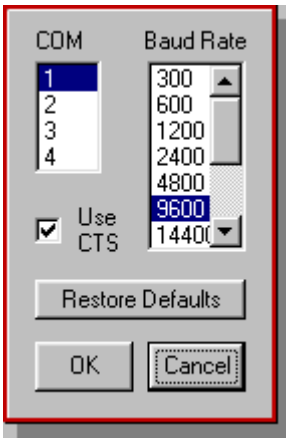
OK

Clicking OK will cause the Com port to be closed and allows the selected settings to be used at the next Write operation.

Cancel

Clicking Cancel will void any user changes to the settings. The Com port will remain unaffected and its prior settings will continue to be used.

Com Port Settings



COM

The program supports any one of four serial Com ports. Normally only Com 1 is available on a PC unless additional ports have been added, thus the program and all board settings defaults to Com 1.

Baud Rate

The Cybernetic chips can operate at a number of different fixed baud rates and can adapt to other rates, including some non-standard rates, so a wide range of baud rates is provided in the list. But beware, your PC may not support all the baud rates. Each board/chip combination has a default Baud setting, but if you change the crystal oscillator or modify the hardware configuration, the chip's supported baud rates may be affected. If you have modified your board, switch to Custom after selecting your board type, and choose new settings.

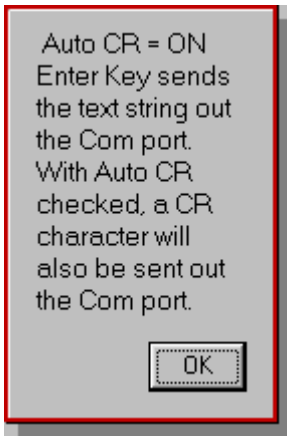
Use CTS

Checking CTS turns on the CTS/RTS (Clear-to-Send/Request-to-Send) combination of RS232 signals. The Cybernetic chips that support this feature use only the CTS signal.

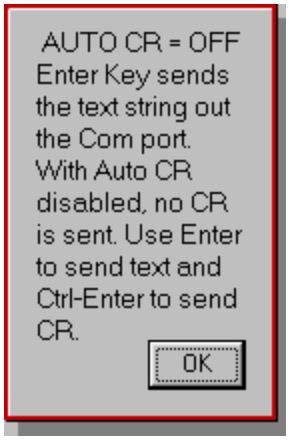
Restore, OK, Cancel

These functions are identical to the previously described group.

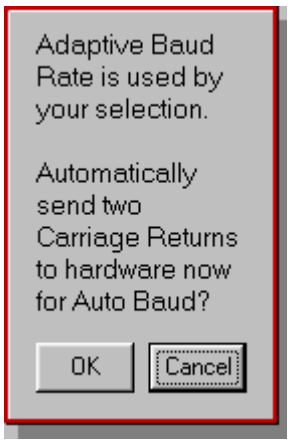
Auto Carriage Return



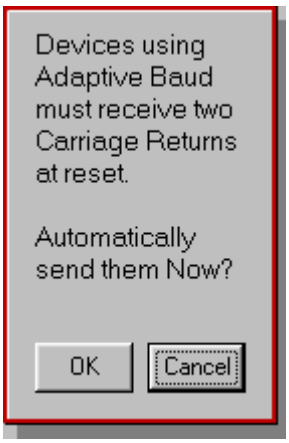
A Carriage Return (ASCII character 13) is the standard line terminator for commands sent to the Cybernetic chips. When AutoCR is checked (the default), the program responds to the Enter key by sending the typed data out the Com port and appending the ASCII character 13. In cases where it is not desirable to send a terminator, the AutoCR flag may be turned off. Subsequently, when the Enter key sends data out the Com port, there will be no addition of character 13. A carriage return can be forced in that mode by issuing Ctrl-Enter whenever needed.



Auto Baud



Many of the Cybernetic chips can adapt their baud rate to match the Com channel. To do so, before receiving any other commands, the device must receive two sequential carriage returns in order to calibrate the timing interval. During board initialization, the Auto Baud selection brings up the option to send the two carriage returns (left). Unlike the other menu options, this one will write to the COM port, so the board must be connected with the Com settings already initialized. If a board that uses auto baud has been reset at any time during testing, Auto Baud may be initiated from the menu to resynchronize the device (right).



Data Entry

Data Input Field

Command entry is processed through the data input field of the Console. Data strings sent with the Enter key are parsed one character at a time to the Com port until the last character is sent. Then, if autoCR is on, a carriage return character (ASCII 13) will be sent out the port. The Transmit buffer of the console is 512 characters long, so typed strings should not exceed this length.

If you do not wish to automatically send a carriage return after every string, turn off AutoCR from the menu. To force a carriage return in that mode, use Ctrl-Enter after a data string has been sent using the enter key.

The program will process Ctrl-A though Ctrl-Z as chip commands; and will immediately send the ASCII character value (01 through 26) out the Com port, without appending a CR (regardless of the state of the AutoCR option).

A printable high-order (8-bit) character may be entered into the input field using its Alt-character code. For example, alt-0169 will display the MSWindows ASCII character for 169, which is ©. However, the Cybernetic chips do not make use of 8-bit data sent in this manner, and most will strip the high bit.

When the CY233 Address is set to a value other than None, the Write address will be prefixed during typing. The prefix is context sensitive, required only after a carriage return, and so may not appear on all data sent out the port. The prefix will look like W00, where 00 is the selected address. When using the full features of the CY233 network chip, addressing should be turned off so a prefix other than Write can be manually set.

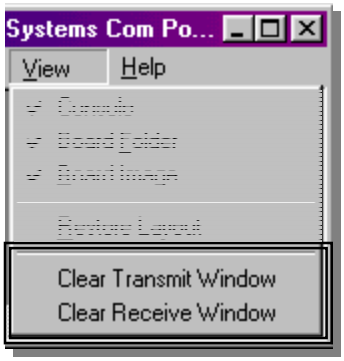
Transmit Window

As each data string is sent out the Com port, it will display in the Transmit window, and the window will scroll a line. A transmitted carriage return will display as <cr> and a control character will display as <ctrl-x>. If transmission fails due to an unresponsive device, the Transmit light will turn red, but transmission attempts will continue (for each character sent) until the port times out on each. To abort further transmission attempts, click the Transmit light.

A pop-up text-editing menu is available with a right mouse click. You may cut, paste, and annotate the Transmit and Receive data and copy it to a text editor for saving to file. Both Transmit and Receive windows will automatically trim off older data when newer data begins to approach the 30k size limitation of the window.

Receive Window

Data received on the Com port will be displayed in the Receive window as ASCII characters. Unprintable characters will be displayed as their ASCII decimal values. Hence, a carriage return will display as <13>, backspace as <8>, and an unprintable high order character may display as <134>. The data will wrap in the window, but the window will scroll a line whenever a carriage return is received.



Clear Transmit Window

Clicking this option will erase the contents of the Transmit window.

Clear Receive Window

Clicking this option will erase the contents of the Receive window.

The User Panels

View

The Arrangement of windows or panels on the user interface is generally fixed. However, the panels can be closed or maximized to improve readability. Every time a new board is opened, the panels will auto arrange to accommodate the new board.

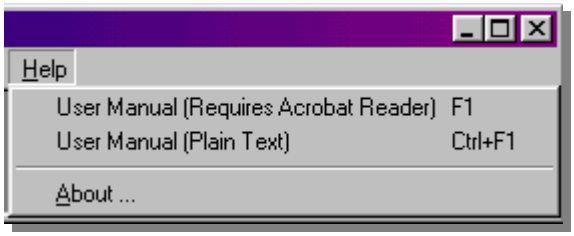
Console, Board Folder, Board Image

The three panels may be opened or closed from the menu. These items will be checked when the indicated screen is visible; otherwise the item will be unchecked. The user may toggle the menu options or effect the panel's state by selecting its Close option.

Restore Layout

The program screen will be reset to its startup size (648x480) and all three panels will be restored to their original position, based on the currently displayed board image. The user may resize the main screen and the three panels will resize proportionally. Except for maximizing a window, separately resized panesl will return to a proportional relationship whenever the main screen is resized or when a new board is loaded.

Accessing Help Files



User Manual

The User Manual is available as both a plain text file and as an Adobe PDF file. Both are accessible from within the program. The plain text version launches Notepad, while the PDF version launches Adobe Acrobat Reader. The help files must be located in the same directory as the CyberCom program.

Technical Notes

Program Installation & Hardware Requirements

This VB6 program runs on Win95, Win98, NT4, and Win2000. It requires the following support files be located in the Windows\System directory:

MsVbVm60.DLL (1.3MB)
MSCOMM32.OCX

The program and its documentation may be placed together in any directory of your choice.

CyberCom.exe
CyberCom.txt
CyberCom.pdf

Com Options and Issues

You will need a free COM port, which can be any of Com1, Com2, Com3, or Com4. The software will support CTS/RTS on/off, Baud rates from 300 to 57600, data lengths of either 7 or 8 bits, the full range of parity, and 1 or 2 stop bits. The default setting is Com1, CTS off, and 9600,n,8,1, ASCII data. Binary Data is not available. DTR/DSR is not available. The Receive buffer limit is 1024 bytes of data. Overflow data will be lost. The Transmit buffer limit is 512 ASCII characters. If exceeded, data will be lost.

If a transmission out the Com port fails due to an unresponsive device, the Transmit light will turn red, but transmission attempts will continue for each character (in the Transmit string) until the port times out on each. To abort further transmission attempts, click the Transmit light.

If an external device transmits to the Com port faster than Windows can service the Com interrupts, the screen will appear to freeze, as it has no time to service keyboard events. A Receive buffer overflow will occur, and the program will close the Com port and return control to the user. The 1k bytes of data in the Receive buffer will be lost. The external device must be silenced before continuing.

Appendix - Chip Command Summary

CY233 Network Serial Commands

All commands are upper case ASCII characters. Most commands are followed immediately by the address (aa) of the CY233 device being addressed. Any additional parameter immediately follows the address.

Command	Description
@aa	Test Network Link (aa is address)
A..F	Undefined, Hex Character Conflict
G	Reserved command letter
H	Undefined
Iaa	Initialize CY233
Jaa	Enable Echo All mode
Kaa	Enable parallel Error status
L	Undefined
MaaHexdata	Fill consecutive locations with hex data
Naacc	Display consecutive locations, count
O	Reserved command letter
Paatttt	Set periodic Master mode delay
Qaa	Query for serial status, returns Qaass
Raa	Read from parallel device, returns RaaData
Saa	Sense local address, returns Saabbccdd..zz
Taatttt	Set handshake Timeout delay
Uaa	Token message
V	Undefined
WaaData	Write to parallel device, data follows
XaaData	transfer to parallel device, data follows
Y.. _	User reserved, ASCII 59h...5Fh

CY308 Command Summary

All commands are upper case ASCII characters. A carat (^) designates a control character. Commands and their parameters are separated by a single space. Multiple parameters are comma-delimited.

Command	Description
^C	Command mode select
^D	Display mode select
^H	Back space over previous display character
^K	Clear the display
^R	Scroll window to the left
^S	Scroll window to the right
^Z	Fix display window at start of RAM buffer
A a	Use LSBit to Set CLK_ALARM
B base	Define address Base parameter
C mode,hr,min,sec,hun	Set clock mode and initial time
D d	Delay for specified milliseconds (to 64K)
F chr,row1,...,row7	Define custom Font for display (HDSP only)
G g	Use LSbit to set CLK_GATE
L mod,addr	Load module char count and address
M mode	Mode command sets mode byte to value
N num,chars	Number of modules, characters per module
O mode	Define general Operational modes
P pos	Set internal RAM buffer Point Position
S addr,data	Write data single address of all modules
W mod,addr,data	Write data to address of one module
? Cmd	Query specified parameter values

CY325 Command Summary

All commands are upper case ASCII characters. A carat (^) designates a control character. Commands and their parameters are separated by a single space. Multiple parameters are comma-delimited.

Command	Description
^C	Command mode select
^D	Display mode select
^K	Klear current window
^M	same as carriage return
^N	Shift out, select special font
^O	Shift in, normal character
^W	Window swap command
B x1,y1,x2,y2	Box command defines pixel-sized window
C x,y	Cursor positioning command
F n,d1,..,d7	Font Creation
G g,data	Graphics download of count and pixel data
H h,yData	Histograph generation count and height
I i	Initialize options
K k	Key # acknowledgment or control
M m,val	Mode command sets mode byte to value
P x,y	Plot a pixel on LCD
S s	Send single byte through CY325
V v	Viewport selected as current window
W x1,y1,x2,y2	Window defines character sized window
Z	HoriZontal Times Square scroll mode
/	Negate command prefix
+	Save window status
-	Restore window status
? Register	Query LCD status register
@ Cnt,Data	transmit string of data through CY325
{	Plot String Command
*	Lower half of 128 (prefix to Viewport)

CY327 Command Summary

All commands are upper case ASCII characters. A carat (^) designates a control character. Commands and their parameters are separated by a single space. Multiple parameters are comma-delimited.

Command	Description
^C	Command mode select
^D	Display mode select
^K	Klear current window
^M	same as carriage return
^N	Shift out, select special font
^O	Shift in, normal character
^W	Window swap command
B x1,y1,x2,y2	Box command defines pixel-sized window
C x,y	Cursor positioning command
D xByte,yPixel	Dimension display
G g,data	Graphics download of count and pixel data
H h,yData	Histograph generation count and height
I i	Initialize options
K k	Key # acknowledgment or control
M m,val	Mode command sets mode byte to value
P x,y	Plot a pixel on LCD
S s	Send single byte through CY327
V v	Viewport selected as current window
W x1,y1,x2,y2	Window defines character sized window
Z	HoriZontal Times Square scroll mode
/	Negate command prefix
+	Save window status
-	Restore window status
? Register	Query LCD status register
@ Cnt,Data	transmit string of data through CY327
[Cnt,y1,...,yn	Plot pixel bytes in window
*	Prefix to plot lower half of 128 pixel display

CY500 Command Summary

All commands are upper case ASCII characters. Commands and their parameters are separated by a single space. All commands, except Q, are terminate by a carriage return.

Command	Description
A	Athome (Declare 0 position)
B	Bitset (Control output=1)
C	Clearbit (Control output=0)
D	Doitnow (Execute program)
E	Enter (Program into CY500)
F f	Factor (divides rate value)
G	Go (begin stepping)
H	halfstep mode
I	Initialize CY500
J	Jog (External stop/start)
L	Left-right (Ext. dir. control)
N n	Number of steps
O	Onestep (Immediately)
P p	Position for stepping
Q	Quit program mode (No carriage return after Q)
R r	Rate, maximum step rate
S s	Slope of accel/decel
T	Til pin 28 high, loop thru program
U	Until pin 38 low, wait here
W	Wait for pin 38 to go high
X x	eXpend milliseconds
+	Clockwise direction
-	Counterclockwise direction
0	Zero, Return to command mode

CY512 Command Summary

All commands are upper case ASCII characters. Commands and their parameters are separated by a single space. Multiple parameters are comma delimited. All commands, except Q, are terminate by a carriage return.

Command	Description
A	Athome (Declare 0 position)
B	Bitset (Control output = 1)
C	Clearbit (Control output = 0)
D	Doitnow (Execute program)
E	Enter (Program into CY512)
F f	Factor parameter for rate
G	Go (begin stepping)
H	Halfstep mode
I	Initialize CY512
J	Jump to address
L c,a	Loop to address for count
N n	Number of steps
O o	Offset stepper drive signals
P p	Position for stepping
Q	Quit program mode (No carriage return after Q)
R r	Rate, maximum step rate
S s	Slope of accel/decel
T	Til pin 28 high, repeat program
U	Until pin 38 low, wait here
V v	Verify buffer contents
W	Wait for pin 38 to go high
X x	eXpend milliseconds
+	Clockwise direction
-	Counterclockwise direction
0	Zero, Return to command mode

CY525 Command Summary

All commands are upper case ASCII characters. Commands and their parameters are separated by a single space. Multiple parameters are comma delimited. All commands, except Q, are terminate by a carriage return.

Command	Description
A a	Absolute location specified
B	Bitset programmable line high
C	Clearbit programmable line low
D d	Delay milliseconds
E	Enter program code
F f	Firstrate, beginning step rate
G	Go, step relative
H	Haltmode, for continuos run
I	Initialize
J j	Jump to address
L c,a	Loop to addr for count
N n	Number of steps
O o	Offset stepper drive signals
P p	Position for stepping
Q	quit entering program code
R r	Rate, maximum step rate
S s	Slope of accel/decel
T t	Til pin 28 low, branch to addr
U	Until pin 38 low, wait here
V v	Verify internal register values
W	Wait for pin 38 to go high
X	eXecute stored program
Z z	Slope divisor for slower accel
+	CW direction
-	CCW direction
0	Zero, Resume Command mode
n$	Label designator prefix for jump/loop location

CY545 Command Summary

Commands are upper case ASCII letters, followed by a space and argument value, as needed. Arguments without a suffix are single-byte values. Arguments with a "16" suffix are two-byte numbers and arguments with a "24" suffix are three-byte numbers up to 16777215. Multiple arguments must be separated by a space or comma.

Command	Description
A pos24	At position, sets current step position.
B bit	Bit set or clear of user selectable bits.
C	set Continuous step mode.
D del16	Delay for specified milliseconds.
E	Enter following commands to external memory.
F Rate	specify First or starting step rate.
G	Go step. Starts relative mode stepping.
H bit	seek Home, using specified bit.
I	Initialize controller, perform software reset.
J addr	Jump to byte address of current memory page.
L num24	set Number of steps for relative motions.
M	[invalid command]
N num24	set Number of steps for relative motions.
O mode	set Operating mode of CY545.
P pos24	step to specified absolute Position.
Q	Quit entering commands to external memory.
R rate	specify slewing or maximum step Rate.
S slope	specify acceleration/deceleration Slope value.
T bit,addr	loop to address Til bit matches value.
U	reserved.
V	reserved.
W bit	Wait for specified bit to match value.
X	eXecute external memory commands.
Y addr16	set external memory address pointer.
Z cnt16,addr	ZillionLoop to byte address for 16-bit count.
+	set CW direction for relative motions.
-	set CCW direction for relative motions.
/	Negate prefix used with Bit commands.
? cmd	Query specified command parameter value.
0	(ASCII zero) stop execution of commands from memory.
[Addr,Cnt,D1,...,Dn	special HP-display support command.
"string"	display all characters between quotes.

CY550 Command Summary

Commands are upper case ASCII letters, followed by a space and argument value, as needed. Arguments without a suffix are single-byte values. Arguments with a "16" suffix are two-byte numbers and arguments with a "24" suffix are three-byte numbers up to 16777215. Multiple arguments must be separated by a space or comma.

Command	Description
A Pos24	At position, sets current step position
B Bit	Bit set to clear of user selectable bits
C	Set Continuous step mode
D Del16	Delay for specified milliseconds
E	Enter following commands to external mem
F Rate	Specify First step rate
G	Go step, relative mode
H Bit	Seek Home, using specified bit
I	Initialize CY550, perform software reset
J Addr	Jump to byte address of current mem page
K Addr16	Set input addr pointer for extended I/O reads
L Cnt,Addr	Loop to byte address for specified count
M Addr16	Set output addr pointer for extend. I/O writes
N Num24	Set number of steps for relative motions
O Mode16	Set Operating mode of CY550
P Pos24	Step to specified absolute Position
Q	Quit entering commands to external memory
R Rate16	Specify slewing step Rate
S Slope	Specify acceleration Slope value
T Bit,Addr	Loop to address Til bit matches value
U	Reserved command
V	Wait for current motion to finish
W Bit	Wait for specified bit to match value
X	eXecute external memory address pointer
Y Addr16	Set external memory address pointer
Z Cnt16,Addr	ZillionLoop to byte address for 16 bit count
+	Select CW direction for relative motions
-	Select CCW direction for relative motions
/	Negate prefix used with bit commands
? Cmd	Query specified command parameter value
0	(ASCII zero) Stop execution of commands from memory
/ Num24	Wait for the specified number of steps
] Pos24	Wait for the specified absolute position
^	Stop the current motion
# Val	Set the value of the I/O byte register
!	Perform extended I/O read
%	Perform extended I/O write
[Addr,Cnt,D1,...,Dn	Special HP Display support command
"String”	Display all characters between quotes