L0Cost Robot Commands

The following tables list the commands the L0Cost robot controller accepts and describes what each command does. This is not a sophisticated command structure and is intended to provide a very simple to implement interface and script facility in order to enable rapid learning and play. The source code is available and while any part of it can be modified, additional commands can be added through blank template functions.

Read this together with the example scripts and web pages to understand what is being done.

Command Source Code	Explanation
0	An internal command, executed with high priority
1	A command received from a web browser. An ACK or NACK message is pushed back if the web page can handle it.
2	A command received as part of a script file. If the command fails, a test flag is set and unset on execution of the next successful command. Until a script command is complete, no further script commands are processed.
3	A command received from PS3 controller processing. No error indicators are returned
4	A command received from the serial port. This runs at 115200 baud, and an ACK or NACK message is returned depending on command success. A command may be an ACK, or a NACK from a command sent to a remote machine.

Command Prefix	Explanation
L	This command is for execution on the local machine. The command text is trimmed and forwarded to the local command processor. If the command is not recognised as a local command then an execution failure is returned.
F	This command identifies a script file which is opened and read, the contents being executed. Some commands can only be executed from within script files. If the file fails to open then an execution failure is returned. Script files can contain both local and remote commands but not file commands, script nesting is not yet supported but planned.
X	This command is for execution on a remote machine attached to the serial port. The command text is trimmed and forwarded to the serial port. The serial port is configured to run at 115200 baud.
H	This command passes the string following to the webserver unaltered to be retrieved by a javascript, or other, in the browser. The default string returned is {"type":null}. For example H{"type":"user","speed":"20","distance":"9"} might indicate to the browser script that this is user data, the speed value is 20cm/s and the distance is 9cm.
P	This command sends instructions to the PS3 controller, limited to lights status and vibration.
T	This command sets execution flags. TON sets execution flag positive or true, TOFF set the execution flag negative or false, TNULL sets the execution flag to neither.

Local Commands	Camera Commands Explanation Camera commands are disabled when the camera is not active such as when running with PS3 control and guidance turned off. They are prefixed with L
CFRAMESIZExx	Camera command to set resolution. xx can be one of the following 10 UXGA(1600x1200) 9 SXGA(1280x1024) 8 XGA(1024x768) 7 SVGA(800x600) 6 VGA(640x480) 5 CIF(400x296) 4 QVGA(320x240) 3 HQVGA(240x176) 0 QQVGA(160x120) Example: LCFRAMESIZE06 sets the camera resolution to VGA
CQUALITYxx	Camera command to set the jpeg quality. xx can be from 2 to 63, with 2 being minimum compression/highest quality, 63 being maximum compression/minimum quality. This also impacts the frame rate when viewing video.
CBRIGHTxx	Camera brightness setting, xx can be -2, -1, 0, 1 or 2, with 2 being the maximum Example: LCBRIGHT00 sets the cameras brightness value to a medium value.
CCONTRASTxx	Camera contrast setting, xx can be -2, -1, 0, 1 or 2, with 2 being the maximum Example: LCCONTRAST-2 sets the cameras contrast setting to minimum
CSATxx	Camera colour saturation setting, xx can be -2, -1, 0, 1 or 2, with 2 being the maximum Example: LCSAT02 sets the cameras colour saturation to maximum
CEFFECTxx	Camera special effect setting, xx can be one of the following 00 No Effect 01 Negative 02 Grayscale 03 Red Tint 04 Green Tint 05 Blue Tint 06 Sepia Example: LCEFFECT06 sets the camera special effect to a sepia colour tone
CAWBx	Camera active white balance is set on when x has a value of 1 and off when x has a value of 0. Example: LCAWB1 turns on active white balance
CAWBGAINx	Camera active white balance automatic gain is turned on when x has a value of 1 and off when x has a value of 0. Example: LCAWBGAIN0 turns off the active white balance automatic gain feature.
CWBMODExx	Camera automatic white balance modes. xx can be one of the following. 00 Auto 01 Sunny 02 Cloudy 03 Office 04 Home Example: LCWBMODE01 sets the automatic white balance mode to compensate for a sunny day
CAECx	Camera automatic exposure correction is turned on when x has a value of 1 and off when x has a value of 0.

	Example: LCAEC1 turns on the feature
CAECDSP0	Camera automatic exposure digital signal processing is turned on when x has a value of 1 and off when x has a value of 0. Example: LCAECDSP1 turns on the feature
CAELEVELxx	Camera automatic exposure level, xx can be set to -2, -1,0,1 or 2 Example:LCAELEVEL-2 set automatic exposure to lowest level
CAGCx	Camera automatic gain control is turned on when the value of x is 1 and off when the value of x is 0. Example: LCAGC1 turns on Automatic gain control
CAGCGAINx	Camera automatic gain control ceiling, where x can be from 0 to 6, and the gain ceiling increases as a power of two from 1, 2, 4, 8, 16, 32 Example: LCAGCGAIN3 set the automatic gain ceiling to 8 times
CBPCx	Camera black pixel correction feature is turned on when the value of x is 1 and off when the value of x is 0 Example: LCBPC1 turns on the black pixel correction feature
CWPCx	Camera white pixel correction feature is turned on when the value of x is 1 and off when the value of x is 0 Example: LCWPC0 turns off the white pixel correction feature
CRAWGMAx	Camera gamma correction feature is turned on when the value of x is 1 and off when the value of x is 0 Example: LCRAWGMA1 turns on the gamma correction feature
CHMIRRORx	Camera horizontal mirror feature is activated when the value of x is 1 and deactivated when the value of x is 0. Example: LCHMIRROR1 reverses the camera image horizontally
CFLIPx	Camera vertical flip feature is activated when the value of x is 1 and deactivated when the value of x is 0. Example: LCFLIP1 inverts the camera image vertically
CDCWx	Camera digital scaling feature is activated when the value of x is 1 and deactivated when the value of x is 0. Example: LCDCW0 turns of the digital scaling feature

Local Commands	General commands
FLASHON	Independently of the camera, turns on the camera illumination led
FLASHOFF	Independently of the camera, turns off the camera illumination led
FLASHPEEK	Independently of the camera, turns on the camera illumination led for 5 seconds
TOGGLEFLASH	Independently of the camera, turns on the camera illumination led if it's off, and turns it off if it's on.
MTRATTACH	Attaches the motor pins for local command control
MTRDETACH	Detaches the motor pins allowing independent control
MTRTIMEOUTxxxx	Detaches the motor pins after the timeout period xxxx in milliseconds
RESET	Reboot the L0cost robot controller

Local Commands	Script commands

REPEAT	Closes the current script file and reopens it for execution from the beginning
PAUSExxxx	Pauses script processing for xxxx milliseconds
SKIPyxxx	Skips the following xxx script file lines depending on the status of the execution status. If y is F, then skip is executed if execution status is failure, else, if y is S then skip is executed if execution status is success. If y is U then skip executed unconditionally. xxx can be negative.

Local Commands	Servo commands xx can be either pin 12 or 13 for servos
SxxAzzzz	Positions servo on pin xx to position zzzz Example: LS12A0045 moves servo on pin 12 to 45 degrees. If the range of the servo angle is exceeded then the new position is the limit exceeded.
SxxIzzzz	Positions servo on pin xx to a position zzzz relative to the current servo position Example: LS13I-025 moves the servo on pin 13 to a position 25 degrees less than the current position. If the set default range of the servo angle is exceeded then the new position is the limit exceeded.
SxxDyzzzzaaaa	Sets defaults for the servo attached to pin xx. When y is M, zzzz represents the default centre position, it defaults to 90. The value aaaa is ignored. The command will fail if the value exceeds the default min and max servo positions set. Example: S13DM0086 set the default central position for the servo on pin 13 to 86 degrees. When y is X, zzzz represent the default maximum servo angle and aaaa represents the default minimum servo angle, which must be equal to or greater than zero. They default to 0 and 180 respectively. The command will fail if the new values make any current servo values invalid. Example: LS12DX02700090 sets the default maximum angle for the servo on pin 12 to 270 degrees and the minimum angle to 90. When y is T, zzzz represent the signal timing for zero degrees rotation and aaaa represents signal timing for maximum rotation.
SxxC	Positions the servo on pin xx to the default central position Example: S12C positions the servo on pin 12 to its default central position
SxxN	Positions the servo on pin xx to the default minimum position Example: S12N positions the servo on pin 12 to its default minimum position
SxxM	Positions the servo on pin xx to the default maximum position Example: S12M positions the servo on pin 12 to its default maximum position

Local Commands	Motor commands
STOP	Stops all motors immediately
HALT	Stops all motors smoothly
	General motor command
MTRxxxxyyyyzzzz	Activates the motors with left at power level xxxx and right at level yyyy for the runtime of zzzz milliseconds
	PS3 controller – standard steering
MTRppppqqqqrrrrssss	Activates the motors with qqqq taken as F/R power and rrrr taken as L/R direction

	PS3 controller – tank steering
MTRppppqqqqrrrrssss	Activates the motors with left at power level qqqq and right at power level ssss. Negative power is taken as reverse.