

“MaLT+ Commands”

Table1 : Avatar’s control commands

Command	Description	Example
Avatar’s movement		
forward number or fd number	Avatar moves forward as many steps as the <i>number</i> value	fd 50
back number or bk number	Avatar moves backward as many steps as the <i>number</i> value	bk 50
Avatar’s orientation		
Right number or rt number	Avatar turns its head to the right by as many degrees as the <i>number</i> value	right 90
left number or lt number	Avatar turns its head to the left by as many degrees as the <i>number</i> value	lt 90
Up number	Avatar turns its head upwards (looks up) by as many degrees as the <i>number</i> value	up 50
down number or dn number	Avatar turns its head downwards (looks down) by as many degrees as the <i>number</i> value	down 50
roll_right number or rr number	Avatar rotates around itself clockwise by as many degrees as the <i>number</i> value	rr 30
roll_left number or rl number	Avatar rotates around itself anticlockwise by as many degrees as the <i>number</i> value	rl 30
Avatar’s position		
Setx number	Places the avatar at the position where x coordinate equals to the <i>number</i>	Setx number
Sety number	Places the avatar at the position where y coordinate equals to the <i>number</i>	Sety number

Setz <i>number</i>	Places the avatar at the position where z coordinate equals to the <i>number</i>	Setz <i>number</i>
Setxy <i>n1 n2</i>	Places the avatar at the position where x coordinate equals to the <i>n1</i> and y coordinate equals to <i>n2</i>	Setxy 50 100
Setxz <i>n1 n2</i>	Places the avatar at the position where x coordinate equals to the <i>n1</i> and z coordinate equals to <i>n2</i>	Setxz 50 -90
Setyz <i>n1 n2</i>	Places the avatar at the position where y coordinate equals to the <i>n1</i> and z coordinate equals to <i>n2</i>	Setyz 50 -90
Setpos [<i>n1 n2 n3</i>]	Places the avatar at the position with the coordinates <i>n1 n2 n3</i>	Setpos [0 0 0]
Home	Avatar returns to initial position 0 0 0	
Xcor	Returns the value of the x coordinate of avatar's current position	
Ycor	Returns the value of the y coordinate of avatar's current position	
Zcor	Returns the value of the z coordinate of avatar's current position	
Pos	Returns the avatar's current position in an array of three numbers [x y z]	
Distanceto [x y z]	Calculates and returns the distance between the avatar's position and the point give as an array input of [x y z]	Distanceto [100 20 30]
Avatar's Trace		
Penup/pu	The avatar doesn't leave a trace while moving in the scene	
Pendown/pd	The avatar leaves a trace while moving in the scene	
Setpensize <i>number</i>	Sets the width of the trace to the value of <i>number</i> (Default is 3)	Setpensize 5
setpencolor [r b g]	Sets the color of the trace to the color code of the r b g array (red blue green)	setpencolor [0 0 0] (Black)
Clean	Clears the 3D scene and lets the avatar in its current position	

Clearscreen/ cleargraphics/cs	Clears the 3D scene and resets the avatar to its initial position 0 0 0	
Showturtle/st/	Shows the avatar on the scene	
Hideturtle/ht	Hides the avatar from the scene	
Other Commands		
Cleartext	Clears the messages from the message area	
Print <i>input</i>	Prints at the message area the output of the <i>input</i> . The <i>input</i> may be a command, a mathematical expression or a variable.	print 1+1 print xpos print :height

Basic colour codes RGB for the avatar's change of colour

Red 255 0 0

Green 0 255 0

Blue 0 0 255

Black 255 255 255

White 0 0 0

You can find more color codes at MaLT's color picker.

Table 2: Programming structures

Command	Description	Example
Conditional Structures		
If <i>condition</i> [comamnds]	If the <i>condition</i> is true, the group of commands inside the brackets [] is executed.	If :x > 10 [Forward 100 Right 90]

Ifelse <i>condition</i> [comamnds1] [comamnds2]	If the <i>condition</i> is true the group of commands1 of the first brackets is executed, else if the condition is false the group of commands2 of the second brackets is executed.	Ifelse :x > 10 [Forward 100 Right 90] [Left 90 Forward 100]
Iterative structures		
Repeat n [commands]	The group of commands inside the brackets [] is repeated n times .	Repeat 4 [Forward 100 rt 90]
While condition [commands] Or dowhile condition [commands]	While the <i>condition</i> is true the group of commands inside the brackets [] is repeated.	While :x<5 [Forward 100 rt 90 make "x :x+1]
Until condition [commands]	Until the condition becomes true , the group of commands inside the brackets [] is repeated.	make "x 0 until :x = 4 [fd 100 rt 90 make "x :x+1]
Repcount	Returns the current repetition number. It is used in repeat n structure	
Operators		
Or Expr1 Expr2	Returns <i>true</i> if at least one of the two expressions is true	If or 2>3 4<5 [print 'true'] (it is true)
And Expr1 Expr2	Returns <i>true</i> if both of the two expressions is true	If and 2>3 4<5 [print 'true'] (it is false)
Not Expr1	Επιστρέφει αληθές	αν ! 2>3 [τύπωσε 'αληθής'] (είναι αληθής)
equal? Value1 Value2	Returns <i>true</i> if value1 is equal to value2	If equal?:a :b [print 'equal']
Notequal? Value1 Value2	Returns <i>true</i> if value1 is not equal to value2	If Notequal?:a :b [print ' not equal']
greater? Value1 Value2	Returns <i>true</i> if value1 is greater than value2	if greater?:a :b [print 'a bigger']

Less? <i>Value1 Value2</i>	Returns <i>true</i> if value1 is less than value2	If Less? :a :b [print 'a smaller']
greaterequal? <i>Value1 Value2</i>	Returns <i>true</i> if value1 is greater or equal to value2	
lessequal? <i>Value1 Value2</i>	Returns <i>true</i> if value1 is less or equal to value2	
Make "variable number	Defines the <i>variable</i> and assigns to the variable the value of the <i>number</i> . Then it can be used as :variable	Make "height 30 (:height will have the value 30)
Rand/random a	Returns a random number between 0 and a	Rand 4 (returns randomly a number among 0, 1, 2, 3, 4)
Output value	Stops the procedure and returns the <i>value</i> . It is used inside procedures	To add :a :b return :a + :b end

Table 3: Mathematical Commands

Command	Description	Example	Result
Sum/add a b	Returns the sum of the two numbers set in its input, i.e. it performs a+b	Sum 3 5	8
Difference/sub a b	Returns the difference of the two numbers set in its input, i.e. it performs a-b	Difference 8 3	5
Product/mul a b	Returns the product of the two numbers set in its input, i.e. it performs a*b	Product 2 4	8
Divide/div a b	Returns the division of the two numbers set in its input, i.e. it performs a/b	Divide 6 3	2
Remainder/modulo/mod a b	Returns remainder of division of the two numbers set in its input	Remainder 11 2	1
Sqrt number	Gives the square root of the number set in its input	Sqrt 36	6

Power/pow $x n$	It raises the x number to the n power and returns the result. Thus, it is x^n	Power 2 4	16
Cos degrees	It returns the cosine of the angle set as an input	Cos 60	0.5
Sin degrees	It returns the sine of the angle set as an input	Sin 60	0.866
Tan degrees	It returns the tangent of the angle set as an input	Tan 180	0
Arccos argument	It returns the angle it calculates from the inverse cosine based on the argument set as an input	Arccos 0.5	60
Arcsin argument	It returns the angle it calculates from the inverse sine based on the argument set as an input	Arcsin 0.5	30
Arctan argument	It returns the angle it calculates from the inverse tangent based on the argument set as an input	arctan 1	45
Radcos rads	It returns the cosine of the angle given in radius (rads)	Radcos 1	0.5403023058 681398
Radsin rads	It returns the sin of the angle given in radius (rads)	Radsin 1	0.8414709848 078
Exp number	It returns the exponential function with a base of e and as a power the number set in its input (e^{number})	Exp 1	2.718
Ln number	It returns the ln value of the number set as an input	Ln 1	0
log10 number	It returns the log10 set as an input	Log10 10	1
Integer/int number	It returns the integer part of the number set as an input	Integer 2.8	2
Round number	It returns the rounding of the number set in its input	Round 2.3 Round 3.8	2 4
Minus number	It returns the minus of the number set as an input	Minus 10	-10

Abs number	It returns the absolute value of the number set as an input	Abs -10	10
pi	It returns the pi (3,14) number	pi	3.14

