

# SYNTHIAM

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## Controlling A Kangaroo With The V4

For Dave and Richard and anyone else who is interested, here is fully working and tested code for using the Kangaroo (with bi-directional comms) via the UART on the V4 with encoder feedback.

I am still quite new with EZ scripting so the code may not be as elegant as I would like, I could not find an ASCII to decimal function in EZ-Builder so I had to write a block of code to do this DJ maybe I am missing...

Last Updated: 9/17/2015

## Step 1

For Dave and Richard and anyone else who is interested, here is fully working and tested code for using the Kangaroo (with bi-directional comms) via the UART on the V4 with encoder feedback.

I am still quite new with EZ scripting so the code may not be as elegant as I would like, I could not find an ASCII to decimal function in EZ-Builder so I had to write a block of code to do this DJ maybe I am missing something here?

Anyway I think this does show how fantastic and versatile the V4 is, well done DJ and team!

Tony

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**Name : V4\_Roo\_serial**

**Author : Tony Ellis**

**Date : 01/07/2014**

**Version : 1.0**

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```
definearray($byte,10) $wheel_turn=63890 $dly=50 $FLAG=0 uartinit(0,0,19200) #  
initialise UART
```

### \*\*\*\*\* Initialise Kangaroo

```
uartwrite(0,0,"D,start",13) # drive channel start uartwrite(0,0,"T,start",13) # turn  
channel start uartwrite(0,0,"T,p0",13) # this is also needed at start
```

```
#goto(START)
```

```
$val=2*$wheel_turn # load position $COMM_CHR="DF3" # D=drive channel -  
F=move forward - 3=speed 3 goto(INC_POS) halt()
```

```
:START
```

```
$val=$wheel_turn-500 $position=0 $unit=round($val/8) $str="4000" $x=1
goto(RAMP) $str="7000" $x=2 goto(RAMP) $str="10000" $x=3 goto(RAMP)
$str="7500" $x=6 goto(RAMP) $str="5500" $x=7 goto(RAMP) $str="2500" $x=8
goto(RAMP) uartwrite(0,0,"D,s0",13) halt()
```

```
:RAMP uartwrite(0,0,"D,s"+$str,13) $v=$unit*$x REPEATUNTIL($position>$v)
goto(GET_POS) ENDREPEATUNTIL print("position="+$position) print("speed="+$str)
return
```

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## Subroutines

### \*\*\*\*\* POSITION commands \*\*\*\*\*

```
:INC_POS # increment position subroutine $str=tostring($val) # convert variable to
string $COMM="pi" # determine direction IF (getcharat($COMM_CHR,1)="R")
$COMM="pi-" ENDIF goto(SEND_DATA) goto(GET_POS) REPEATUNTIL($FLAG=1)
goto(GET_POS) ENDREPEATUNTIL print("POSITION = "+$position) return
```

```
:GET_POS # get current position subroutine uartwrite(0,0,"D,getp",13) sleep($dly)
goto(GET_DATA) print($position) return
```

---

```
:SEND_DATA $M_SPEED=(getbyteat($COMM_CHR,2)-48)*1200 $string=
(getcharat($COMM_CHR,0)+","+$COMM+$str+"s"+$M_SPEED) # build data packet
uartwrite(0,0,$string,13) # send packet sleep($dly) # delay required return
```

---

```
:GET_DATA $num_bytes=uartavailable(0,0)
```

```
$data=uartread(0,0,$num_bytes)
```

```
$byte1=getbyteat($data,0) # byte 1 = command $byte2=getbyteat($data,1) # byte 2
= "," $byte3=getbyteat($data,2) # byte 3 = command completed status
```

### \*\*\*\*\* Convert ASCII digits to decimal number

```
$total=0 $multiplier=1 $x=$num_bytes-2 REPEATUNTIL($x=3)#$num_bytes-7)
$byte[$x]=getbyteat($data,($x-1)) $byte[$x]=($byte[$x]-48)$multiplier
$total=$total+$byte[$x] $multiplier=$multiplier10 $x-- ENDREPEATUNTIL
```

### \*\*\*\*\* Determine byte 3

# \$FLAG=0

```
IF ($byte3=80) $FLAG=1 # "P" returned so move completed ELSEIF ($byte3=112)
$FLAG=2 # lowercase "p" so move not completed ELSEIF ($byte3=83) $FLAG=3 #
"S" returned so speed reached ELSEIF ($byte3=115) $FLAG=4 # lowercase "s" so still
accelerating ENDIF
```

```
IF ($FLAG<3) $position=$total ELSEIF ($FLAG>2) $speed=$total ENDIF
return ```
```