

Interfacing a Robosapien with a mote

The commands to control the robosapien are sent from the IR transmitter to the receiver to the main control board as a sequence of 8 bits (most significant bit first). These bits are encoded using a *space coded* signal. The space coding works as follows:

- **Default** signal state: high
- **Start:** signal goes low for 8/1200 seconds
- **Data bits** (sequence of 8):
 - **0:** signal high for 1/1200s and low for 1/1200s
 - **1:** signal high for 4/1200s and low for 1/1200s

The IR control can be skipped by directly interfacing the microcontroller (mote) with the robosapien main control board.

Detailed commands from: http://www.andrew.cmu.edu/user/ebuehl/robosapien-lirc/ir_codes.htm

Movement Commands (no shift)

- \$80 - turn right (on left side of remote)
- \$81 - right arm up (upper left button on remote)
- \$82 - right arm out
- \$83 - tilt body right
- \$84 - right arm down
- \$85 - right arm in
- \$86 - walk forward
- \$87 - walk backward
- \$88 - turn left (on right side of remote)
- \$89 - left arm up (upper right button on remote)
- \$8A - left arm out
- \$8B - tilt body left
- \$8C - left arm down
- \$8D - left arm in
- \$8E - stop

Programming Commands (no shift)

- \$90 - P (Master Command Program)
- \$91 - P>> (Program Play, the one on the bottom)
- \$92 - R>> (Right sensor program)
- \$93 - L>> (Left sensor program)
- \$94 - S>> (Sonic sensor program)

GREEN shift commands

- \$A0 - right turn step
- \$A1 - right hand thump
- \$A2 - right hand throw
- \$A3 - sleep
- \$A4 - right hand pickup
- \$A5 - lean backward
- \$A6 - forward step
- \$A7 - backward step
- \$A8 - left turn step
- \$A9 - left hand thump
- \$AA - left hand throw
- \$AB - listen
- \$AC - left hand pickup
- \$AD - lean forward
- \$AE - reset
- \$B0 - Execute (master command program execute)

- \$B1 - Wakeup
- \$B2 - Right (right sensor program execute)
- \$B3 - Left (left sensor program execute)
- \$B4 - Sonic (sonic sensor program execute)

ORANGE shift commands

- \$C0 - right hand strike 3
- \$C1 - right hand sweep
- \$C2 - burp
- \$C3 - right hand strike 2
- \$C4 - high 5
- \$C5 - right hand strike 1
- \$C6 - bulldozer
- \$C7 - oops (fart)
- \$C8 - left hand strike 3
- \$C9 - left hand sweep
- \$CA - whistle
- \$CB - left hand strike 2
- \$CC - talkback
- \$CD - left hand strike 1
- \$CE - roar
- \$D0 - All Demo
- \$D1 - Power Off (drop snow-globe and say "Rosebud")
- \$D2 - Demo 1 (Karate skits)
- \$D3 - Demo 2 (Rude skits)
- \$D4 - Dance

NOTES:

- add \$08 to go from right-side commands to left-side commands.
- add \$20 to command bytes for the GREEN shift (ie. \$Ax and \$Bx range)
- add \$40 to command bytes for the ORANGE shift (ie. \$Cx and \$Dx range)

SECRET UNDOCUMENTED CODES

Several different launch codes (Executing the main program)

- \$B0 - standard "EXECUTE" on remote
Robot says "uh-huh" before starting Main program
No subroutines called [Execute sensor commands (Green Shift) cause error sounds to be played instead of what they should do -- bug or feature you decide]
- \$97 - appears to be same as \$B0
- \$98 - Quiet execute main program
Robot does not say "uh-huh"
No subroutines called

- \$9A - Quiet execute main program with subroutines !!
Robot does not say "uh-huh"
Subroutines are called (as documented in the manual). This is the one to use.
Execute feature appears to be same as \$91 (regular remote Program Play). \$91 button also does other things like end the current recording. \$9A code doesn't.

Useful? secret codes

- \$F6 - feet shuffle
- \$FB - nothing (useful as NO-OP)
- \$FC - raise arm throw
- \$D6 - karate chop

WORK IN PROGRESS, not useful [or at least no significant difference detected]

- \$95,\$96 - Program main again (like \$90)
- \$99 - like \$98
- \$9B - like \$90 ?
- \$9C - do nothing
- \$9D,\$9E,\$9F - like \$90 ?
- \$B5 - like \$97 ?
- \$B6 - like \$90 ?
- others - looks like these repeat as well (eg: record/execute one of the program areas) or do nothing
- \$E0 - \$EE (looks like the \$A0 range)
- \$EF - nothing
- \$F0 - like \$97
- \$F1 - like \$98
- \$F2 - Execute right program
- \$F3 - Execute left program
- \$F4 - Execute sonic program
- \$F5 - like \$F0/97 ?
- \$F7 - like \$F0/97 ?
- \$F8,\$F9,\$FA - like \$F1/98 ?
- \$FD,\$FE,\$FF - program main again (like \$90)