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)