Reverse Engineered Control-A1 codes (Using the Sony CDP-CX250)

        Written by BigDave (10/23/97)

Best Viewed with a Fixed Pitch character set (not a TrueType, etc.)

(use Notepad or something)

Let's review the actual format being sent from the CD player

The Control-A1 line is normally held high (5v)

There are 3 data bits (held low at 0v) of a Control-A1 packet.

Every bit is separated by a gap (5v) of 625us. The data bits are:

Start bit (2500us), '0' bit (650us), and '1' bit (1240us).

The above timings were given to me from someone else (I haven't

hooked my player to an actual oscilloscope to verify the exact

timings). But the lengths relative to each other match my

findings.

Each packet is in the form of: S[byte1][byte2][byte3]...

Bytes are Most Significant Bit first.

Now the codes themselves (written in hex unless otherwise noted):

The first byte tells the controller which CD player is talking:

98 = CDP-1

99 = CDP-2

9A = CDP-3

Bytes 2 onward tell you what information or command is being given.

When they are commands:

00 = Play

01 = Stop

02 = Pause

06 = Moving the CD Carosel

08 = Ready

0C = 29 seconds left on current track (Displayed during play)

When they are "Status" or information bytes:

18 = Door Open

2E = Power On

2F = Power Off

50 <Disc#> <Track#> <Length min> <Length sec> = Playing Track

        - <Disc#>: 1 byte Discs 1-99 are Binary Coded Decimal (BCD)

                        Discs 100-200 are HEX-54d

        - <Track#>: 1 byte   Tracks are BCD

        - <Length minutes>: 1 byte Minutes are BCD

        - <Length seconds>: 1 byte Seconds are BCD

52 <Disc#> = Displaying on front panel the track/time/memo info for <Disc#>

        - <Disc#>: 1 byte Discs 1-99 are BCD

                        Discs 100-200 are HEX-54d

54 <Disc#> = Retrieving <Disc#>, or Loading <Disc#>

        - <Disc#>: 1 byte Discs 1-99 are BCD

                        Discs 100-200 are HEX-54d

58 <Disc#> = Retrieved <Disc#>, or Loaded <Disc#>

        - <Disc#>: 1 byte Discs 1-99 are BCD

                        Discs 100-200 are HEX-54d

61 <Disc Capacity> <something else> = Tells the controller something

                              about the CDplayer itself.

                              I call it the "CD Model

                              Identifiers."

        - <Disc Capacity>: 1 byte   100 Disc Player is 00 hex

                                    200 Disc Player is FE hex

                                    50+1 Disc Player (I am speculating

                                       it will be 50 or 51 hex)

        - <Something else>: 1 byte   usually 0B hex

 70 <00hex> <CD Playing status> <00hex> <Disc#> <00hex>

          - <00hex>: 1 byte Could mean something...but for me it never

                             changes.

          - <CD Playing status>: 1 byte (divided into 2 half bytes)

                - Half byte 1: (4 Most Significant bits) b1b2b3b4

                        - bit 1: 0 = Scanning Discs (happens when you

                                         open, then close the CD door)

                                 1 = Discs known (knows which discs

                                         are loaded and which are not)

                        - bit 2: 0 = Play mode: 1 Disc

                                 1 = Play mode: All Discs

                        - bits 3,4: 00 = Play mode: Repeat Off

                                    01 = Play mode: Repeat All

                                    10 = Play mode: Repeat 1

                - Half byte 2: (4 Least Significant bits) b1b2b3b4

                        - bits 1-4: 0000 = Normal

                                    0001 = Shuffle

                                    0010 = Program

 Format for commands to send to the CD Player (in hex unless otherwise

 noted).

 The first byte tells which of the 3 possible CD players to execute

the command. The format is as follows:

 90 = Sends command to CD-1

 91 = Sends command to CD-2

 92 = Sends command to CD-3

 Bytes 2 onward give the specific command to the CD player

 00 = Play

 01 = Stop

 02 = Pause

 03 = Toggle Pause

 50 <Disc#> <Track#> = Play the song on Disc#, Track#

        - <Disc#>: 1 byte Discs 1-99 are BCD

                           Discs 100-200 are HEX-54d

        - <Track#>: 1 byte Tracks are BCD

 NOTES:

 <Disc#>: 1 byte can have 256 unique numbers. Sony ignores disc 00

           on the 200 Disc Players. Disc 100 on the 100 Disc Players

           is represented as 00 hex. Also, their "hacked" format for

           200 discs (their format for the 100 disc players is simple,

           just BCD) allows a total of 201 possible discs. This

           explains Discs 100-200 being equal to the

           hex value - 54(base 10) while Discs 1-99 are in BCD. The

           algorithm to take the byte given for disc# and printing it

           on a computer screen in base 10 is as follows:

           //Comment: (hb1 = 4MSB and hb2 = 4LSB of the byte)

           if (hb1 > 9)

               print("Disc #" + (16*hb1 + hb2 - 54))

           else

```
        print("Disc #" + (10*hb1 + hb2))
```

  <Track#>,<Length min>,<Length sec>: Simple BCD. Algorithm to print

          in base 10 is as follows:

          print(10*hb1 + hb2)

  Let's say that CD-1 is playing Disc 148, Track 3, which is 3m 48s

  long. The output from the player is (hex): 98 50 CA 03 03 48

  Now for Disc 62, Track 14, which is 2m 14s long: 98 50 62 14 02 14

  When the unit is first given power, the following information is

  given:

  -Power Off

  -CD Model Identifiers: <Disc Capacity> 0B

  When the On button is first pressed, the following information is

  given:

  -Power On

  -Retrieved (or Loaded) Disc Number <Disc#>

  -Retrieved (or Loaded) Disc Number <Disc#>

  -CD Model Identifiers: <Disc Capacity> 0B

  -Displaying on Front Panel the time/track/memo info for: <Disc#>

  -Ready

  Please update information above, or fix possible errors.