

Interface Protocol of SEGA MegaDrive's 6-Button-Controller

Pin Assign (D-SUB9P)

#	SignalName	Explanation (Direction)
1.	D0	Data (Controller -> Mainframe)
2.	D1	Data (Controller -> Mainframe)
3.	D2	Data (Controller -> Mainframe)
4.	D3	Data (Controller -> Mainframe)
5.	+5V	PowerSupply (Supplied to Controller by Mainframe)
6.	D4	Data (Controller -> Mainframe)
7.	Sel	SelectSignal (Mainframe -> Controller)
8.	GND	Ground
9.	D5	Data (Controller -> Mainframe)

All signals are TTL compatible.

In Case of 3-Button-Controller

```
Sel  D0 D1 D2 D3 D4 D5
Low  UP DW LO LO A  ST
High UP DW LF RG B  C

# LO --- Always Low
# UP --- Up of Cross Key
# DW --- Down of Cross Key
# LF --- Left of Cross Key
# RG --- Right of Cross Key
# A ---- Trigger Button A
# B ---- Trigger Button B
# C ---- Trigger Button C
# ST --- Start Button
## Low -> Pressed , High -> Not Pressed
```

Data Aquisition Sequence of 6-Button-Controller

```
Sel  D0 D1 D2 D3 D4 D5
Low  UP DW LO LO A  ST
High UP DW LF RG B  C
Low  UP DW LO LO A  ST
High UP DW LF RG B  C  # If there is two up-edge in 1.1 milli seconds,
Low  LO LO LO LO LO A  ST # D0 - D3 go Low as Sel goes Low.
High Z  Y  X  MD HI HI  # Make Sel High and read D0 - D3.
Low  HI HI HI HI A  ST  # Check that D0 - D3 go High as Sel goes Low.
High UP DW LF RG B  C  # Once this sequence take place
Low  UP DW LO LO A  ST  # sequence can't be started for 1.8 milli seconds
.      # after the first up-edge of Sel.
.      # Only Datas read in 1.6 milli seconds from the
.      # first up-edge of Sel are reliable.

# LO --- Always Low
# HI --- Always High
# UP --- Up of Cross Key
# DW --- Down of Cross Key
# LF --- Left of Cross Key
# RG --- Right of Cross Key
# A ---- Trigger Button A
# B ---- Trigger Button B
# C ---- Trigger Button C
```

```
# X ---- Trigger Button X
# Y ---- Trigger Button Y
# Z ---- Trigger Button Z
# ST --- Start Button
# MD --- Mode Button
## Low -> Pressed , High -> Not Pressed
```

Time parameters were measured by using my PC's timer.
It seems that the time is measured by discharging of
a capacitor in a 6-Button-Controller. It may mean
parameters differ one by one controller.
Please choose values you think proper for parameters.

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