EZ-232 RS-232 Serial Interface

The EZ-232 Interface, designed by Jim Brain, provides a low-speed serial port for Commodore 8-bit computers. It can operate at speeds of up to 2400bps, when configured as a standard interface, and at speeds of up to 9600bps, when configured as a UP9600 interface.

To reduce the cost of getting the prototype boards made, I decided to not have solder mask applied to the board. This can make soldering tricky, so you may notice a couple stray traces of solder on the board. They won't affect the working of the board. I've gotten pretty good at soldering these, but I'm still human, and the iron doesn't always obey my commands.

I'll first explain the jumpers and switches on this board for those of you who purchased one already assembled.

The jumpers on the board are used to change between 2400bps and 9600bps modes. As the board layout shows, if you short JP1, JP2 and Pins 2-3 of JP3, it'll be configured as a UP9600 interface. Novaterm 9.6 has a serial driver for this interface, and it will allow you to communicate up to 9600BPS on the user port. I usually leave mine jumpered this way, as it still seems to work fine at lower speeds, and with Q-Link at 1200bps. Shorting pins 2-3 of JP3, and unjumpering JP1 and JP2 return it to a standard 2400bps interface.

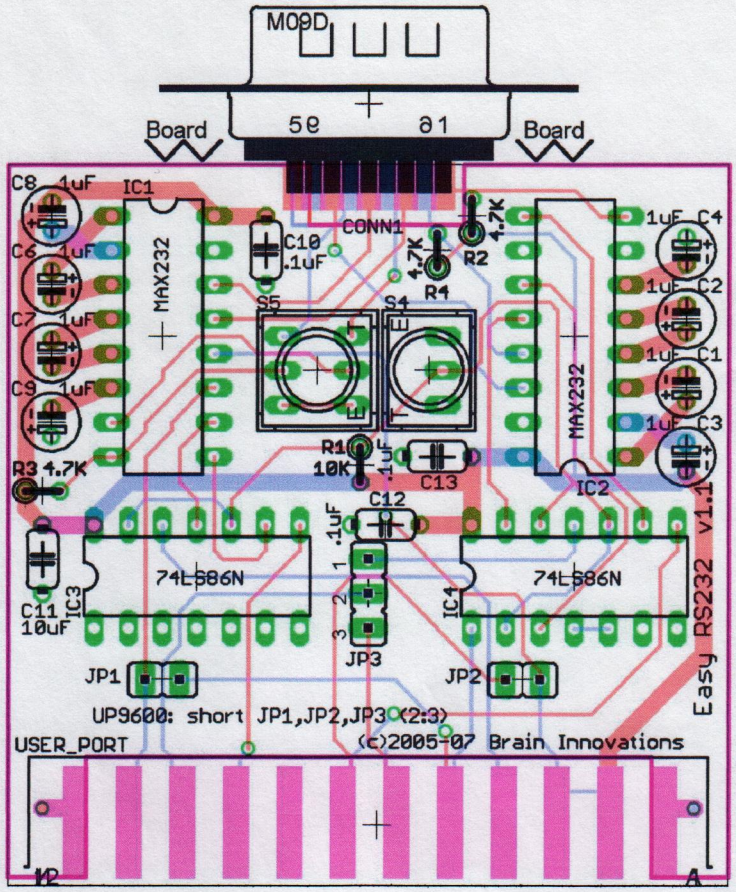
Switch S4 will invert the control lines (DCD and DTR). This is used if you wish to have an inverted carrier detect signal used. Normally this switch is in the off position, towards the DB9.

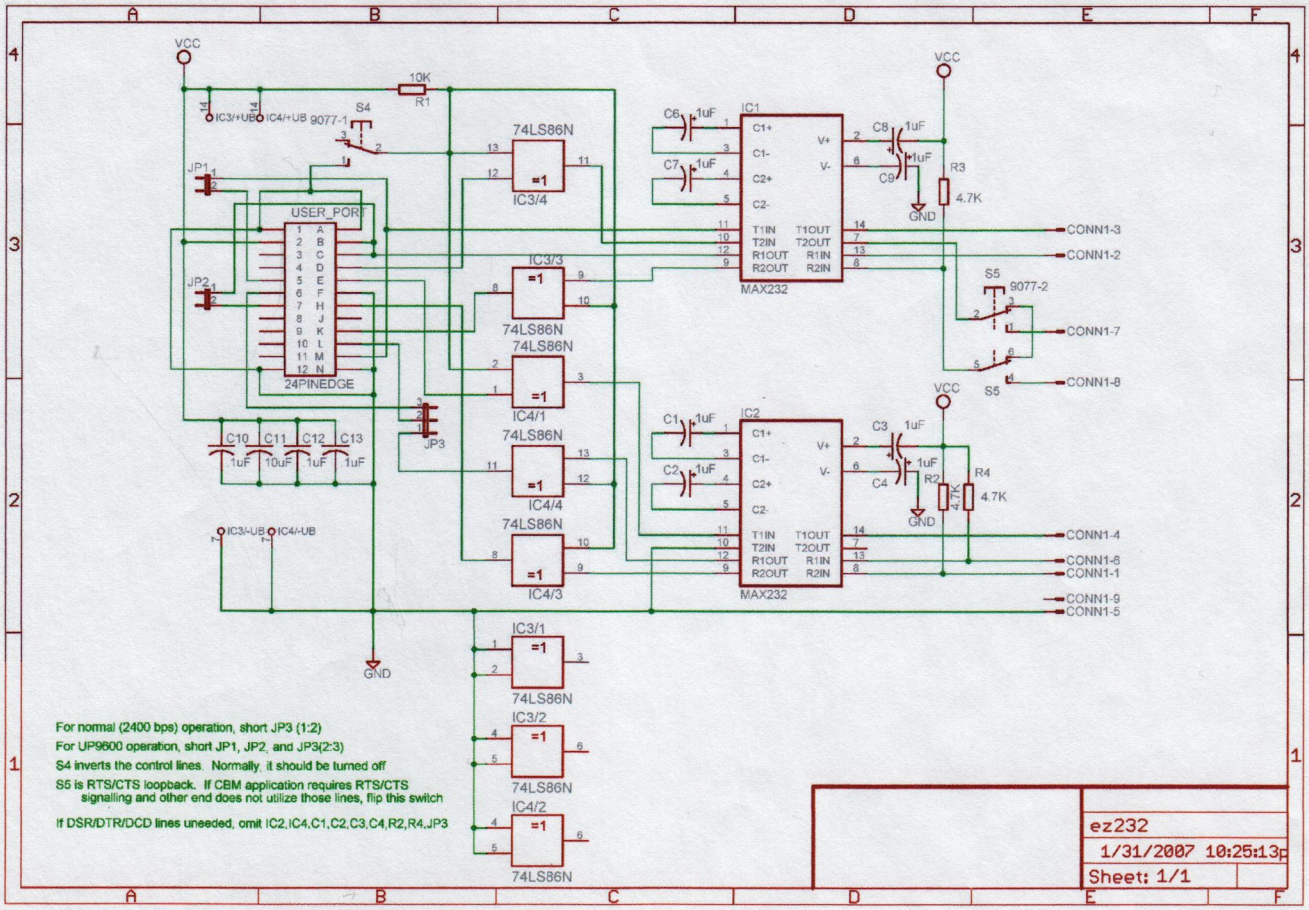
Switch S5 is the RTS/CTS loopback. If you're using software that requires RTS/CTS handshaking, but the device you're connected to doesn't provide it, then flip this switch to the on position. Normally, you'll leave it off, towards the DB9.

That's about it for using the device, now onto some tips on assembling it yourself!

I'm going to assume you have the proper equipment, and have already honed your soldering skills on other stuff before you've decided to build this. Normally, when I put these together, I start with the sockets. They're all the same height, and you can let the board sit on them while soldering. Next, I tackle the discrete components. You'll notice the solder pads for the capacitors and resistors are quite small. Yea, they're not the easiest things to solder. What I usually do, is apply heat to the lead of the component and then touch the solder to the lead as close to the board as I can. The resistors should all be installed standing straight up. The larger pads for the sockets and jumpers are much easier, as you can heat the pad and the lead at the same time while applying the solder. The last things I solder are the DB9 and edge connector. I generally use more solder on the 4 end pins on the edge connector, as they're on the largest parts of the board and can bear the most load.

Before plugging the interface into the computer, you should do a quick check with a multimeter between pins M and N on the edge connector. Make sure there's not a dead short between those two pins. If there is, check for solder jumping over the void between the solder pad and the ground plane on the board. I have found this can happen quite easily, so it's best to check the board before you apply power to it with your Commodore.


M09D
Board
Board
C8 1uF
IC1
C6 1uF
C7 1uF
C9 1uF
MAX232
C10 .1uF
CONN1
4.7K
R2
4.7K
R1
S5
S4
1uF C4
1uF C2
1uF C1
1uF C3
MAX232
IC2
R3 4.7K
R1 10K
.1uF
C13
C12
.1uF
C11 10uF
IC3
74LS86N
74LS86N
IC4
JP3
JP1
JP2
UP9600: short JP1,JP2,JP3(2:3)
(c)2005-07 Brain Innovations
Easy RS232 v1.1
USER_PORT
M2
A


VCC
10K
R1
S4
IC3/+UB
IC4/+UB
9077-1
JP1
JP2
USER_PORT
24PINEDGE
JP3
C10 1uF
C11 10uF
C12 1uF
C13 1uF
IC3/-UB
IC4/-UB
GND
74LS86N
IC3/4
IC3/3
IC4/1
IC4/4
IC4/3
IC3/1
IC3/2
IC4/2
C6 1uF
C7 1uF
C8 1uF
C9 1uF
IC1
MAX232
R3 4.7K
CONN1-3
CONN1-2
S5
9077-2
CONN1-7
CONN1-8
C1 1uF
C2 1uF
C3 1uF
C4 1uF
IC2
MAX232
R2 4.7K
R4 4.7K
CONN1-4
CONN1-6
CONN1-1
CONN1-9
CONN1-5
For normal (2400 bps) operation, short JP3 (1:2)
For UP9600 operation, short JP1, JP2, and JP3(2:3)
S4 inverts the control lines. Normally, it should be turned off
S5 is RTS/CTS loopback. If CBM application requires RTS/CTS signalling and other end does not utilize those lines, flip this switch
If DSR/DTR/DCD lines uneeded, omit IC2,IC4,C1,C2,C3,C4,R2,R4,JP3
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Link-232 High Speed RS-232 Serial Interface

The Link-232 Interface, designed by Jim Brain, provides a high-speed serial port for Commodore 8-bit computers. It can operate at speeds of up to 38400bps, and is compatible with all software that can utilize a Dr. Evil Labs or CMD Swiftlink cartridge.

To reduce the cost of getting the prototype boards made, I decided to not have solder mask applied to the board. This can make soldering tricky, so you may notice a couple stray traces of solder on the board. They won't affect the working of the board. I've gotten pretty good at soldering these, but I'm still human, and the iron doesn't always obey my commands.

I'll first explain the jumpers on this board for those of you who purchased one already assembled.

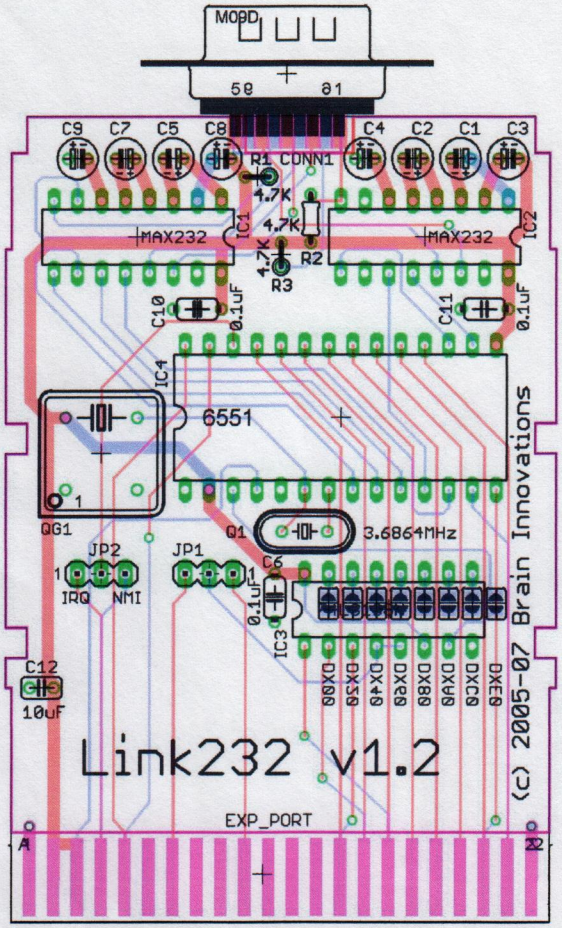
Jumper JP1 on the board is used to change the I/O address from $DE00 to $DF00. Short pins 1-2 for $DF00, and pins 2-3 for $DE00.

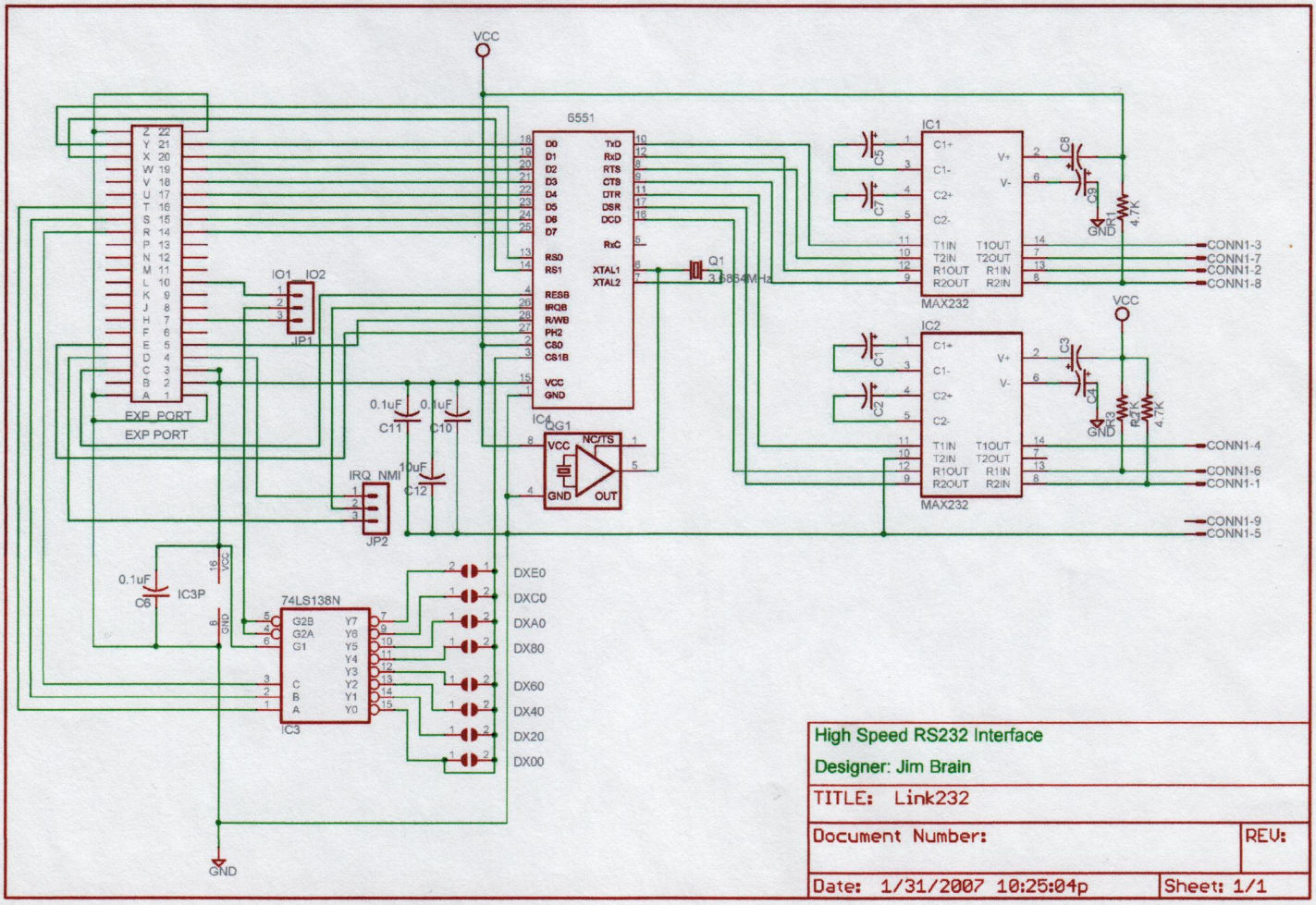
Jumper JP2 changes the ACIA interrupt between NMI and IRQ. Use NMI mode with all Commodore computers in native mode, and IRQ for the C128 in CP/M mode. Shorts pins 1-2 for IRQ, and pins 2-3 for NMI.

That's about it for using the device, now onto some tips on assembling it yourself!

I'm going to assume you have the proper equipment, and have already honed your soldering skills on other stuff before you've decided to build this. Normally, when I put these together, I start with the sockets. They're all the same height, and you can let the board sit on them while soldering. Next, I solder on the DB9 connector, as a couple of the 1uF capacitors obscure pins 1 and 5 on the DB9. Then, I tackle the discrete components. You'll notice the solder pads for the capacitors, resistors and crystal are quite small. Yea, they're not the easiest things to solder. What I usually do, is apply heat to the lead of the component and then touch the solder to the lead as close to the board as I can. The resistors should all be installed standing straight up. The larger pads for the sockets and jumpers are much easier, as you can heat the pad and the lead at the same time while applying the solder.

Before plugging the interface into the computer, you should do a quick check with a multimeter between pins 1 and 2/3 on the edge connector. Make sure there's not a dead short between those two pins. If there is, check for solder jumping over the void between the solder pad and the ground plane on the board. I have found this can happen quite easily, so it's best to check the board before you apply power to it with your Commodore.


MODD
50
01
C9 C7 C5 C8 C4 C2 C1 C3
R1 CONN1
4.7K
4.7K
4.7K
R2
R3
MAX232
IC1
MAX232
IC2
C10
0.1uF
C11
0.1uF
IC4
6551
QG1
Q1
3.6864MHz
JP2
IRQ NMI
JP1
C6
0.1uF
IC3
C12
10uF
DX00 DX20 DX40 DX60 DX80 DXA0 DXC0 DXE0
Link232 v1.2
(c) 2005-07 Brain Innovations
EXP_PORT
A
Z


VCC
6551
D0 D1 D2 D3 D4 D5 D6 D7
RSD RS1
RESB IRQB R/WB PH2 CS0 CS1B
VCC GND
TxD RxD RTS CTS DTR DSR DCD RxC
XTAL1 XTAL2
Q1
3.6864MHz
IC1
C1+ C1- C2+ C2-
V+ V-
T1IN T2IN R1OUT R2OUT
T1OUT T2OUT R1IN R2IN
MAX232
C5 C7 C8 C9
4.7K
GND
CONN1-3
CONN1-7
CONN1-2
CONN1-8
IC2
C1 C2 C3 C4
R3 R4
4.7K
CONN1-4
CONN1-6
CONN1-1
CONN1-9
CONN1-5
EXP_PORT
EXP PORT
IO1 IO2
JP1
0.1uF C11
0.1uF C10
IC4
OG1
NC/TS
VCC
GND
OUT
IRQ_NMI
10uF C12
JP2
0.1uF C6
IC3P
74LS138N
G2B G2A G1
C B A
Y7 Y6 Y5 Y4 Y3 Y2 Y1 Y0
IC3
DXE0
DXC0
DXA0
DX80
DX60
DX40
DX20
DX00
GND
High Speed RS232 Interface
Designer: Jim Brain
TITLE: Link232
Document Number:
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Date: 1/31/2007 10:25:04p
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