CORSHAM

Corsham Technologies, LLC

www.corshamtech.com
617 Stokes Road, Suite 4-299
Medford, NJ 08055

SS-30 Serial Board, Revision 4

Introduction

Thank you for buying our SS-30 Serial Board!

Is this board vintage? Sort of. The 6850 is definitely vintage but the MAX233 level converter chip is not. DB-9s weren't common for serial ports back then either; that was introduced by IBM a few years later.

Features

The board is compatible with the MP-S for most uses, but does not include clocking for an external cassette interface, nor current loop support.

Features:

- Compatible with MP-S for RS-232 applications.
- Plugs into any SS-30 slot.
- Has a simpler RS-232 interface.
- The DB-9 is meant to plug directly into a modern computer's serial port.
- A Molex connector with GND, RO and RI pins is provided on the top so cables meant for the original MP-S will plug in and work.
- Provides easy jumpers for getting different baud rates from user defined pins.

Connectors

There are three connectors with RS-232 level signals on them. They are all tied in parallel, so you can hang three different RS-232 devices on the transmit pins, but only one should be connected to the receive pin or else the devices will be "fighting" each other as they attempt to drive the signal level.

The 10 pin Molex connector is the most compatible with the MP-S board, but it only has RS-232 ground, transmit, and receive signals. There is no 20 ma current loop interface. The three signals are labeled GND, RI (RS-232 in - receiver) and RO (RS-232 output – transmitter).

There are options for two DB-9 connectors, but we only install one. If you are using this board in a real SWTPC, then you need to have the DB-9 on the top connector because the rear connector faces directly into the chassis and can't be used. These are the pin connections on the DB-9 (either one), and unused pins are not connected:

> Pin 5 is Ground.
> Pin 2 is transmit out.
> Pin 3 is receive in.

Baud Rate Selection

Like the original MP-S, the baud rate is generated by the CPU board and is taken from the SS-30 bus. There is a row of jumpers on the left side of the board marked for the baud rates 110, 150, 300, 600, 1200, RESERVED, AUX1, and AUX2.

For most users, simply setting the jumper in one of the leftmost five positions will be sufficient.

For those who want to try something different, the AUX1 and AUX2 signals are brought to two test points below the jumpers, labeled AUX_1 and AUX_2. You can connect an alternate clock source to either of those inputs. SWTPC users often connected higher baud rates to the User Defined pins 3 and 4. Both of these are available along the lower right hand side of the board and labeled UD_3 and UD_4.

Interrupts

Interrupts weren't very popular back in the early days of microcomputers, as most people preferred the simplicity of polled I/O. However, JP1 allows the interrupt output line from the 6850 to be connected to either the NMI or IRQ line. You will

have to write your own drivers to make use of interrupts, as SWTBUG does only polled I/O.

Do not fear interrupts! Once you get them working, you won't want to go back to polling!

Why This?

Back when SWTPC was around, I was a teenager without much money to spare. I got their catalogs and was intrigued by their inexpensive kits and simple designs that could be assembled by average people. The entry point for a working system was a bit beyond my means, so I ended up with a KIM-1 instead.

Years later, I have my own company that has been making Apple/Franklin and KIM-1 expansion boards and one night I decided it was within my abilities to make a clone of the original SWTPC machine. By using some parts available now, the design can be simplified.

Bob Applegate
May 2014

Revision History

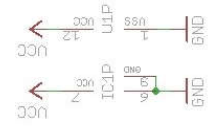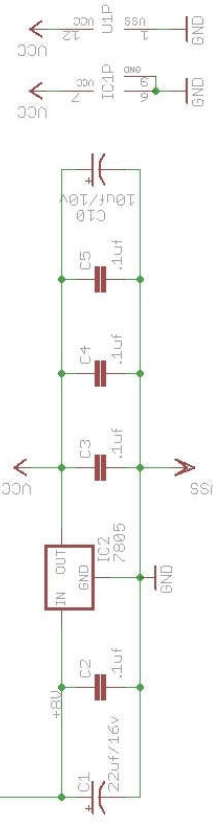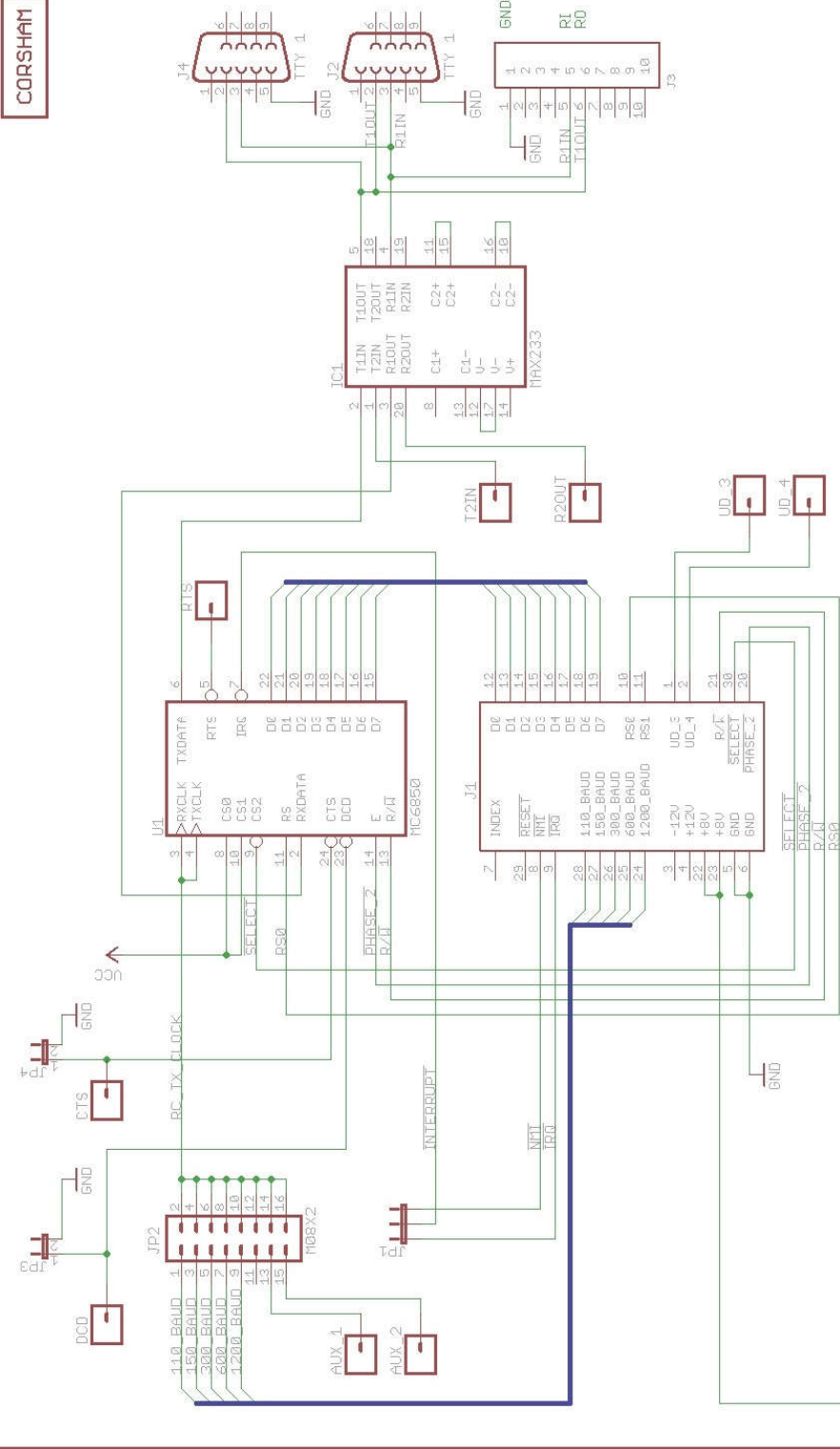| Version	Changes
A	Initial Beta.
1	Initial release
2	Minor fixes
3	Artwork clean-up
4	Switched from MAX232CPE to MAX233

Errata

C1 is labeled as 220uf but a value of 10 or 22 uf will be installed. The smaller values are more than sufficient.

Jumper blocks should be installed on JP3 and JP4, or they could be jumpered permanently with small pieces of wire. Failure to jump these two connectors might result in no data transfers.

Parts List

Part	Number	Description
PCB	1	Printed Circuit Board (Corsham Tech)
J1, J3	4	Molex 09-52-3101
J2, J4	2	DB-9 female
JP1	1	1x3 pin header, .1" spacing
JP2	1	2x8 pin header, .1" spacing
JP3, JP4	1	1x2 pin header, .1" spacing
C1, C10	1	10uf, 25v electrolytic capacitor
C2, C3, C4, C5	1	.1 uf disc capacitor
IC2	1	7805 +5 VDC regulator, TO-220 case
U1	1	MC68B50 ACIA
	1	24 pin socket for U1
IC1	1	MAX233
	1	20 pin socket for U2

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TTY 1
J4
GND
9 8 7 6
5 4 3 2 1

TTY 1
J2
GND
9 8 7 6
T1OUT 5 4 3 2 1
R1IN

GND
RI
RO
J3
1 2 3 4 5 6 7 8 9 10
GND R1IN T1OUT

IC1
MAX233
T1IN T1OUT
T2IN T2OUT
R1OUT R1IN
R2OUT R2IN
C1+   C2+
C1-   C2+
V-   C2-
V+   C2-

T2IN
R2OUT

UD_3
UD_4

RTS

U1
MC6850
TXDATA
RXCLK
TXCLK
RTS
IRQ
CS0
CS1
CS2
RS
RXDATA
CTS
DCD
E
R/W
D0 D1 D2 D3 D4 D5 D6 D7

J1
INDEX
RESET
NMI
IRQ
110_BAUD
150_BAUD
300_BAUD
600_BAUD
1200_BAUD
-12V
+12V
+8V
GND
GND
D0 D1 D2 D3 D4 D5 D6 D7
RS0 RS1
UD_3 UD_4
R/W
SELECT
PHASE_2

SELECT
PHASE_2
R/W
RS0

SELECT
RS0

PHASE_2
R/W

VCC

RC_TX_CLOCK

T1IN
GND
CTS

INTERRUPT

NMI
IRQ
T4

JP2
1 2
3 4
5 6
7 8
9 10
11 12
13 14
15 16
M08X2

T1IN
GND
DCD

110_BAUD
150_BAUD
300_BAUD
600_BAUD
1200_BAUD

AUX_1
AUX_2

T4

VCC
U1P
IC1P
VCC
USS
GND
VSS
GND

VCC
VSS

IC2
7805
IN OUT
GND
GND

C1
22uf/16v
+8V

C2
.1uf

C3
.1uf

C4
.1uf

C5
.1uf

C10
10uf/16v

GND

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Date: 1/6/16 8:13 PM

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