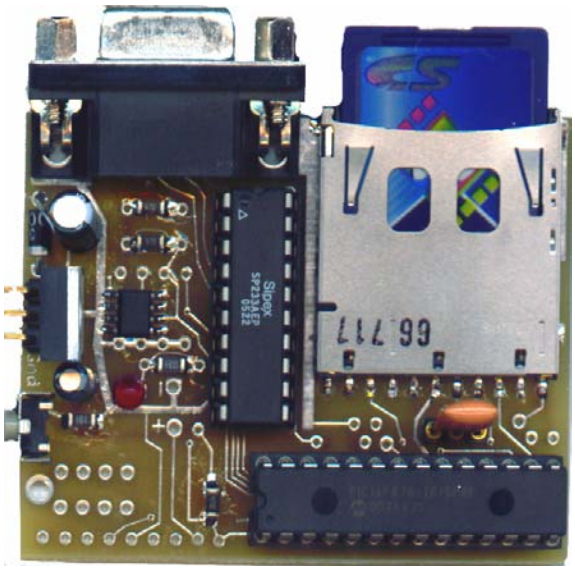
Storage Card Interface Kit

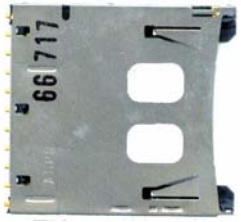
for MultiMediaCards(MMC) and Secure Digital Cards (SD)

MMSD3F



The MMSD3K is complete development kit interfaced to a SD or MMC card. This board ideal for projects that involve long term data logging and require huge amounts of storage space. Tested with SD cards from 16mb to 512mb. The kit is backward compatible with MMC storage cards.

MMC storage



The SD card socket is also compatible with the MMC cards as shown on the left.

SD card

The printed circuit board (pcb) accommodates an SD socket, a PIC16F876 micro controller, a 24LC64 I2C eeprom or a FRAM FM24CL64 (on model MMSD3KF pcb) and a Max233 (or equiv) RS232 transceiver. The circuit runs on 3.3 volts which is provided by an LM2937 3.3 voltage regulator. Only PORTC pins of the 16F876 controller are used, the remaining pins of PORTA & PORTB are brought out to headers and can be used for any purpose. The DB9 female connector provides serial I/O as well as a means of in-circuit programming of the PIC, providing the PIC has a bootloader installed. Can be upgraded, by using a PIC16LF2620 or equivalent low voltage PIC (3.3v) instead of the 16F876.

Construction Hints

Assembly of this kit requires that the user has the necessary tools and skills to work with SMD (surface mount device) components. If you are not comfortable with soldering miniature parts, then please seek assistance from someone who is capable to do so. Small mistakes can cause many frustrating hours of grief in trouble shooting!

Minimum tools required:
A fine point low power (25w max) soldering iron and thin solder. Ideally, 0.022" diameter (or less) silver-bearing non-corrosive rosin core should be used. In addition. narrow needle nose pliers, diagonal cutting pliers, good quality tweezers, large magnifying glass, volt-ohm meter, and a 7 to 12 vdc power supply.

Make sure that you work in a clean well lighted area and have adequate desk area. If you have carpeting then please be aware of static discharge as well as accidentally losing tiny components in the carpets fiber. SMD capacitors and resistors are very tiny and can quickly become lost in the carpeting.

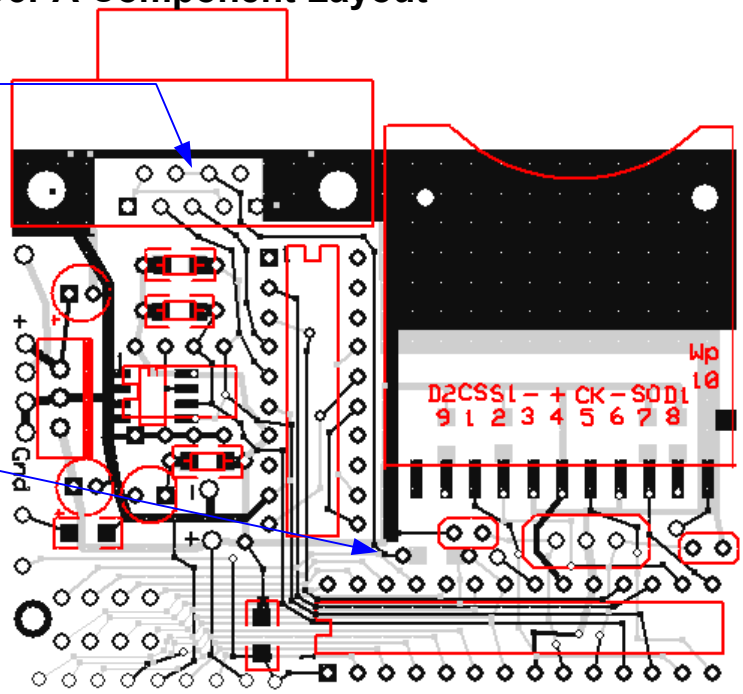
Disclaimer and Terms of Agreement

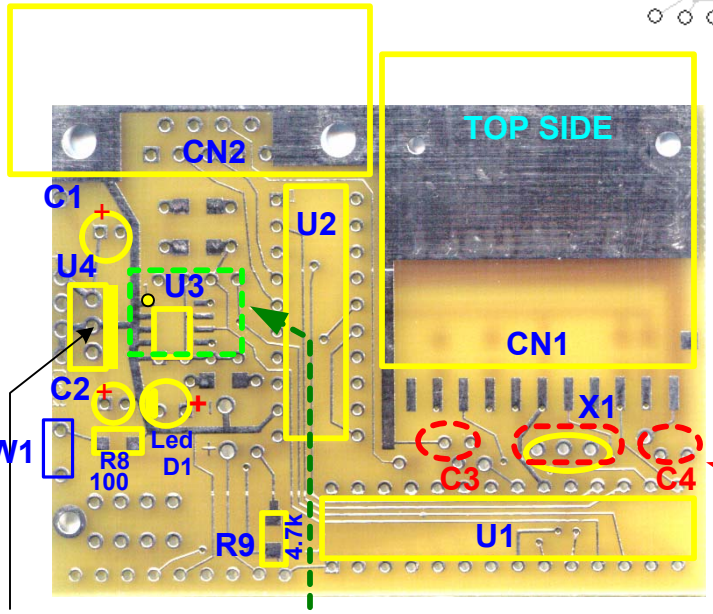
As with any kit, only the individual parts supplied are guaranteed against defects and not the user assembled unit. All kit parts are purchased from reputable sources such as Digikey Inc, Allied Electronics and Mouser Inc, however, should a kit part be ascertained to be defective it will be replaced at no charge within 30 (thirty) days of the purchase date. Beyond that, COMPSys Workbench and / or the COMPSys developer(s) assume no liability and WILL NOT be held liable nor be held responsible wholly or in part for any damages caused by the construction of and / or use of their products sold .

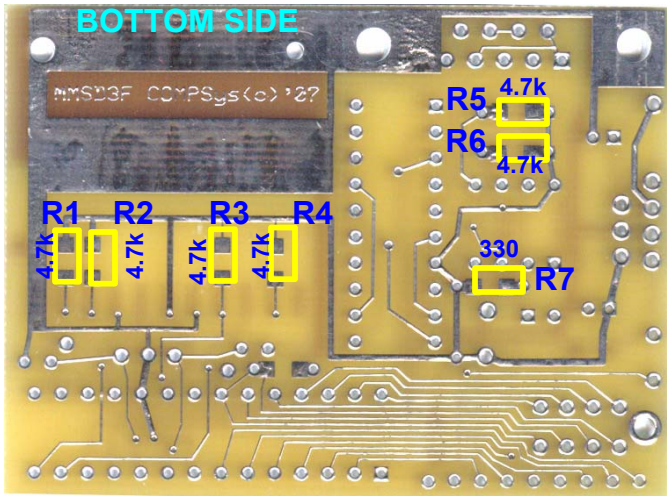
MMC3PA Component Layout

Pins 7 and 8

NOTE: The RS232 does not provide hardware handshaking. If you need to use the RS232 CTS/ RTS line directly, you can cut the trace between DB9 pins 7 and 8 and then wire from those pins to which ever pins on the PIC16F876 are to be used. For convenience, DB9 **Pin8** already has a trace which leads to a **pad** on the pcb







Optional

A standard I2C eeprom, 8 pin DIP, can be used instead of the FRAM

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A 10Mhz crystal can be used instead of the 10Mhz resonator which would then require C3 and C4 20pf caps

Note: R1-R4 must be SMD resistors, R5,R6 and R7resistors can be SMD or standard resistors and can be *mounted either on the top or the bottom of the PCB.*

PARTS

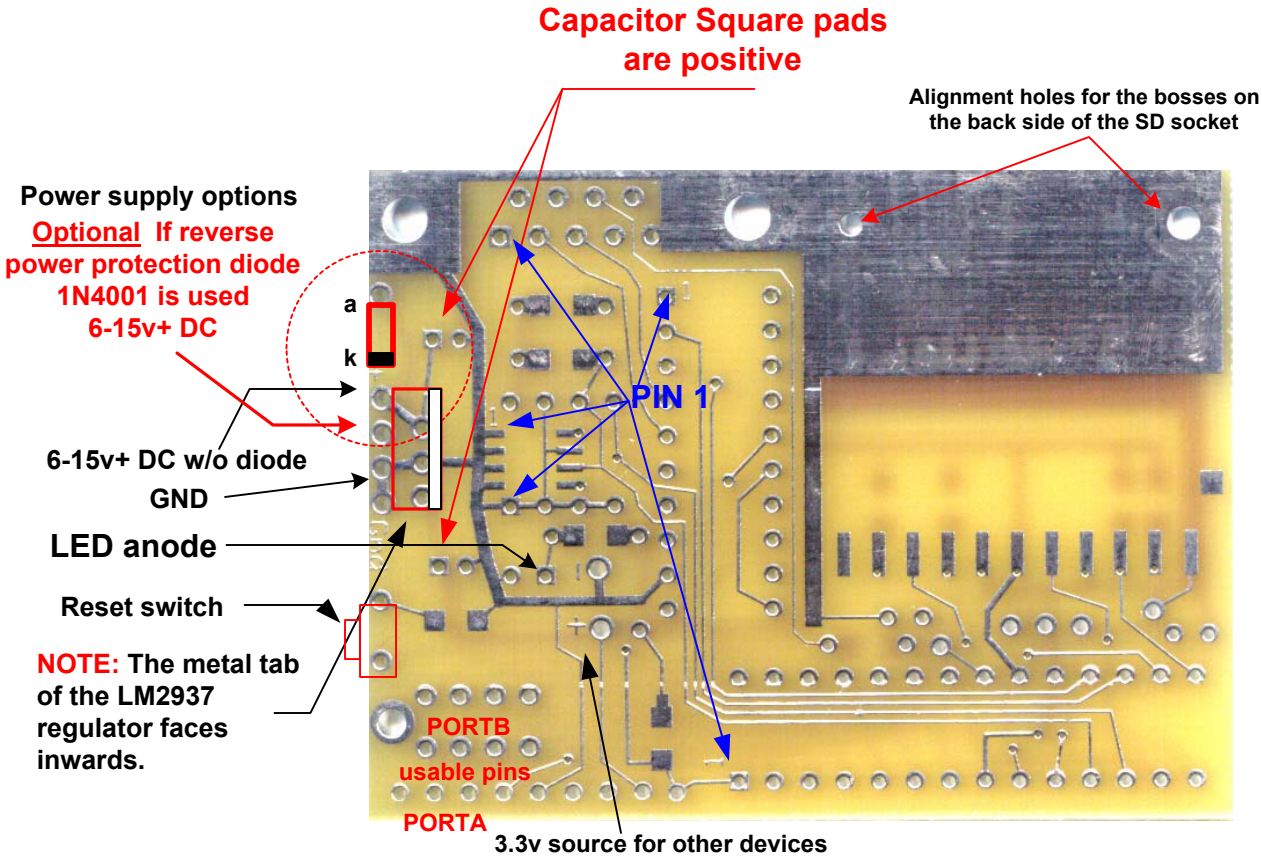
R1-R6,R9 4.7k or 10K res
R7 330 ohm resistor
R8 100 ohm resistor
SW1 momentary switch

C1 10 uf radial capacitor
C2 1 uf or 0.1 uf radial capacitor
X1 10Mhz ceramic resonator
CN1 SD socket
CN2 DB9 Female connector

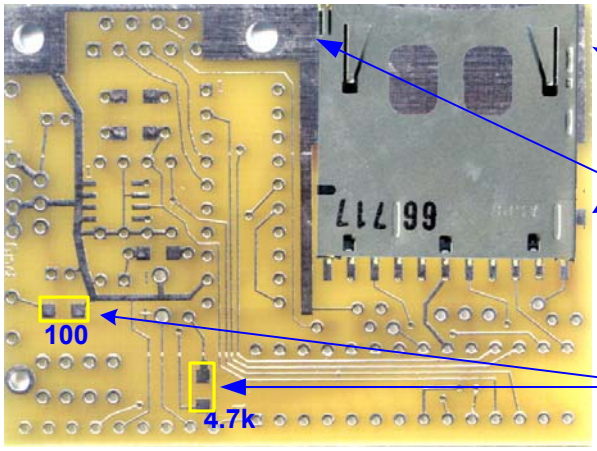
D1 power LED
U1 PIC16F876 or equiv
U2 Max233 (or equiv)
U3 24CL64 FRAM
U4 LM2937 3.3v regulator

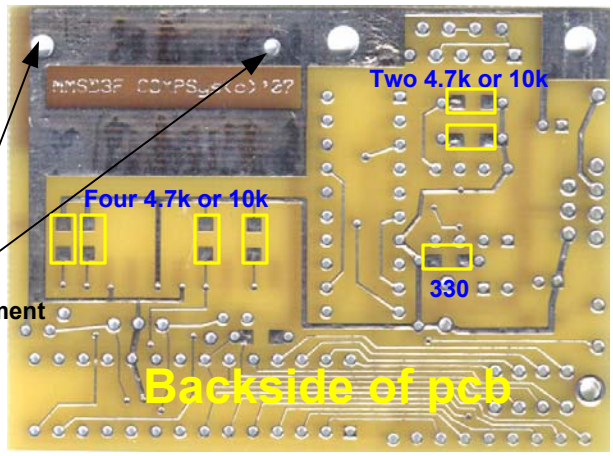
Misc: 20pin and 28 pin IC sockets

MMSD3 PCB Ver F Construction notes



Use a fine tip (15-20W maximum) soldering iron . DO NOT use acid core or corrosive solder. Fine (.022 or less diameter) silver-lead solder works the best. Make sure you identify the Pin 1 location on the IC as well as the pcb. *Double check all placement of parts before soldering!*





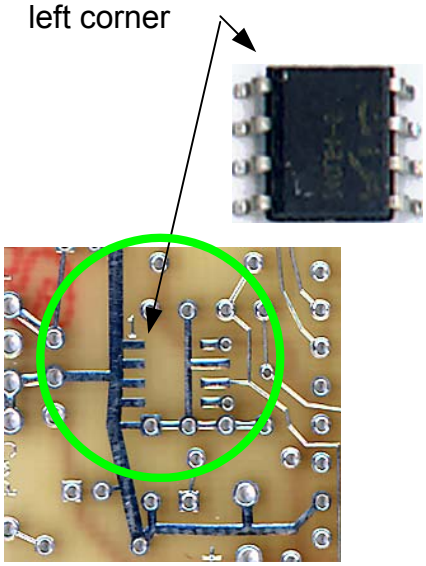
Step 1 - Mount the SD socket. Align the bosses on the back side of the socket with the holes on the pcb. Apply a tiny amount of solder to each pin. Secure the socket by applying a little solder to the tabs and the pcb. *Check for solder bridges!*

Step 2 - Mount the SMD resistors with a tiny amount of solder. Use tweezers to hold them in place while soldering. The back side has six 4.7k or 10k resistors and one 330 ohm resistor. The top side has one 100 ohm and one 1k resistor

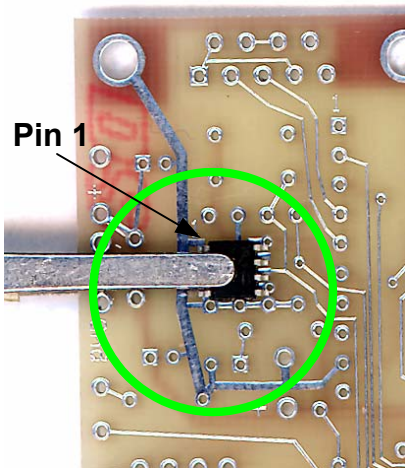
MMSD3 Kit Construction Notes (cont)

Step 3 - Mounting the FM64CL FRAM

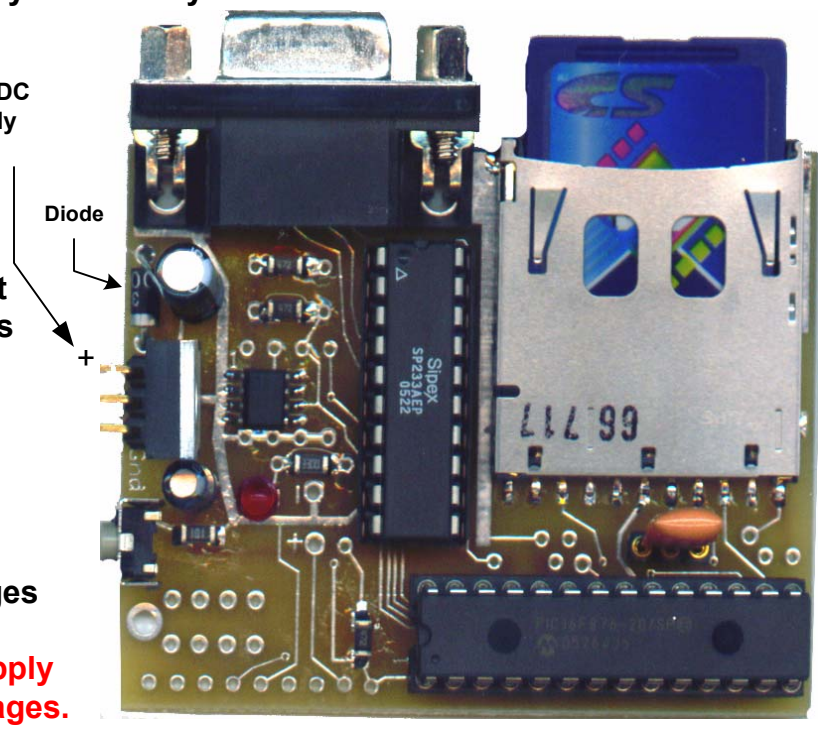
Pin 1 is identified by a dimple or a dot on the top left corner



Use a **fine tip (15-20W maximum) soldering iron** . **DO NOT use acid core or corrosive solder**. Fine (.022 or less diameter) silver-lead solder works the best. Make sure you identify the Pin 1 location on the IC as well as the pcb. One method of holding the IC in place is to use tweezers. Another method is to apply a dab of contact cement to the bottom of the IC and then position it in place. The pads on the pcb are pre-soldered, therefore simply applying heat to the IC leg as it sits on top of the pad will suffice. **If you find that it is necessary to apply more solder please do so very carefully and in very small amounts.**



Step 4 - Mount and solder the rest of the components. Make sure that the DB9 connector is seated properly. *Observe polarity of the capacitors and the LED*. Mount the IC sockects with the notched end towards Pin 1 side. Mount the power regulator and make sure that the metal TAB is facing *inward*. Finally, mount the reset switch and the ceramic resonator. Check all parts for proper placement and soldering.



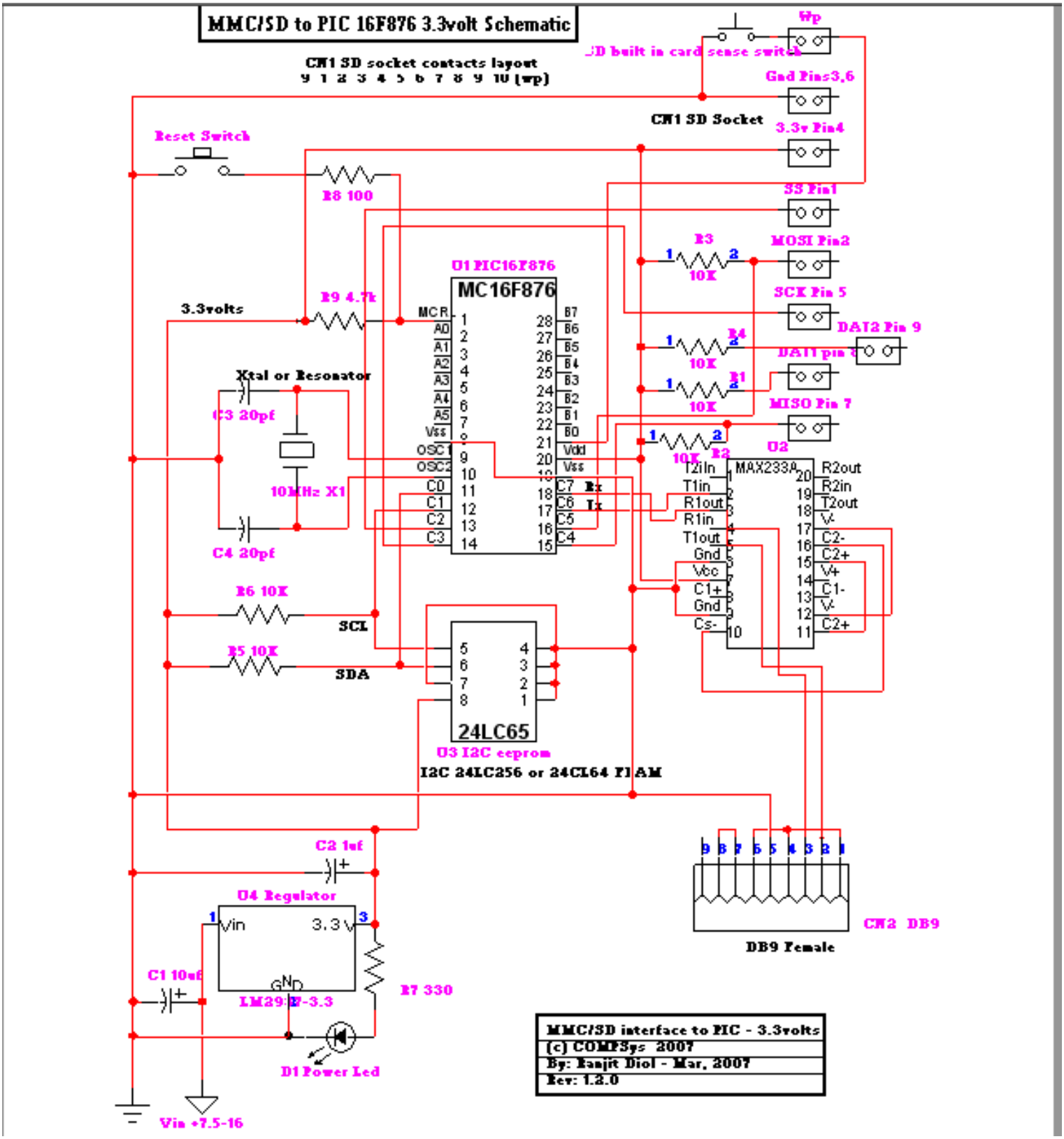
Top side completed

Step 5 - *Double check* all soldering for bridges and cold solder joints. Before placing the PIC16F876 and Max233 ICs in their sockets apply power to the board and check for proper voltages. The '+' pins should have no more than 3.3v DC and the LED should light up.

DO NOT REVERSE POLARITY!

Step 6 - Properly align and insert the PIC16F876 and MAX233 (or equiv) ICs in their respective sockets. This completes the construction as shown on the right. *The SD card is not provided with the kit..*

MMC/SD Schematic Ver F



Please note that modifications may have been made without notice part numbers may not match the actual board