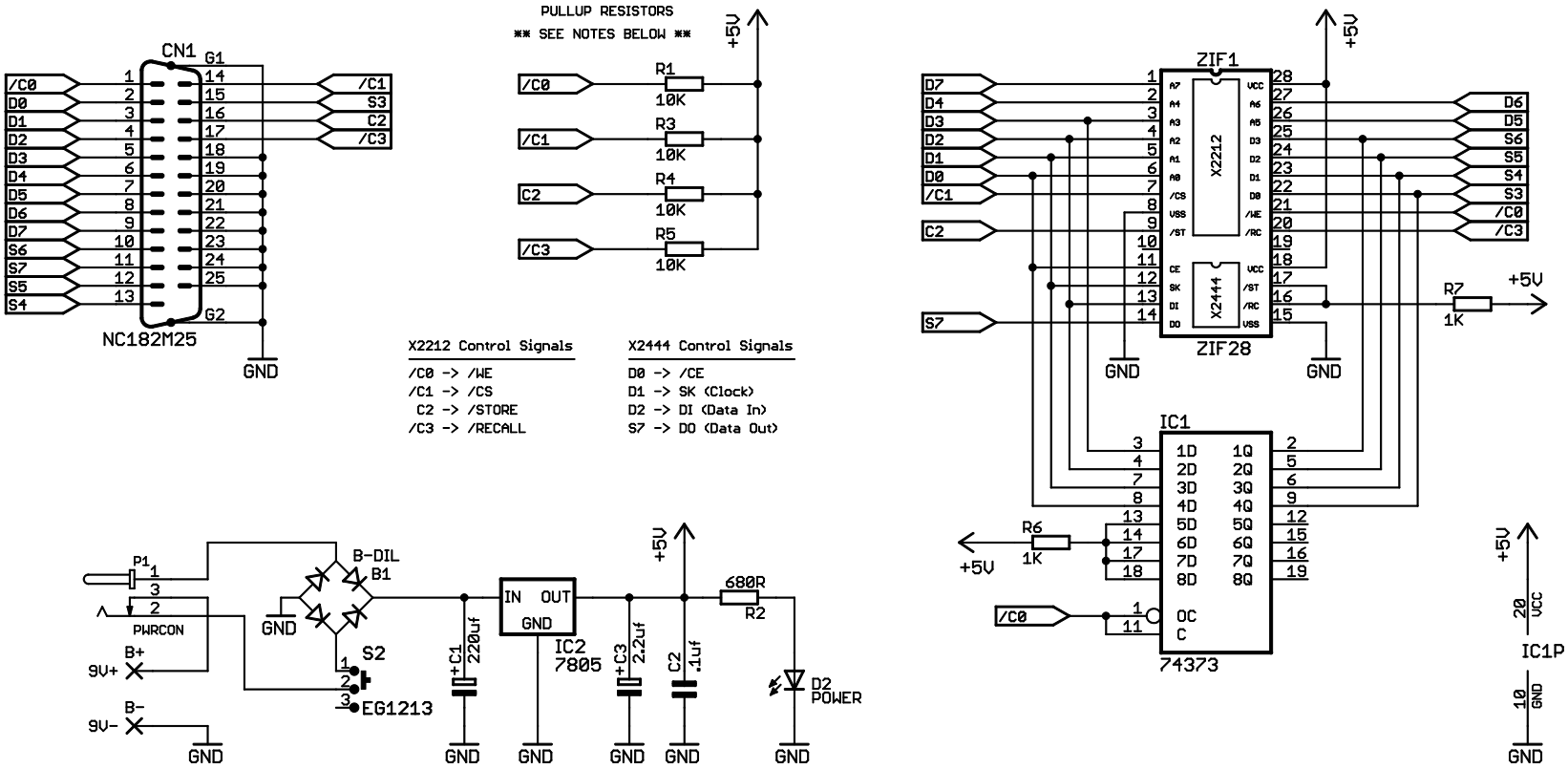
PARALLEL PORT I/O

X2212/X2444 EEPROM PROGRAMMER



NOTES:

Pullup resistors R1, R3, R4 and R5 may be omitted. In some cases these may cause improper operation depending on the computers parallel port. These are provided as extra protection against glitching the chips during insertion and removal if desired. Therefore only add these after proper has been confirmed.

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DRAWN	TITLE X2212 & X2444 EEPROM Programmer Original design by Gary Marsh VO1CPU			REV A
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PSXPROG **PARTS LIST** Rev-A Updated 2/26/2004

Reference	Qty.	Description	Supplier	Part Number
C2	1	.1uF 50V Poly Film Cap	Digi-Key	P4593-ND
C3	1	2.2uF 63V Axial Electrolytic	Digi-Key	4063PHCT-ND
C1	1	220uF 16V Axial Electrolytic	Digi-Key	4019PHCT-ND
D2	1	LED Red	Digi-Key	P363-ND
B1	1	DIP Bridge Rectifier	Digi-Key	DF005MDI-ND
IC2	1	7805 5V Regulator	Digi-Key	NJM7805FA-ND
IC1*	1	SN74LS373 D-Type Octal Latch	Digi-Key	296-1660-5-ND
R1, R3-R5	4	10.0K 1206 SMD Resistor	Digi-Key	P10.0KFCT-ND
R6, R7	2	1.0K 1206 SMD Resistor	Digi-Key	P1.00KFCT-ND
R2	1	680R 1/4W MF Resistor	Digi-Key	681XBK-ND
S2	1	SPDT Slide Switch R/A	Digi-Key	EG1906-ND
P1	1	2.1 x 5.5mm Power Jack	Digi-Key	CP-102AH-ND
CN1	1	DB25 Male Connector R/A	Digi-Key	182-725M-ND
ZIF1	1	28 Pin ZIF Socket	Digi-Key	A303-ND
SIP	1	50 Pin SIP Machined Socket	Digi-Key	ED7150-ND
SO1	1	20 Pin IC socket with .1uf cap	Digi-Key	ED2112-ND
Misc Items				
	1	SerPac Plastic Enclosure	Digi-Key	SR251G-ND
Case	1	9V Battery Clip	Digi-Key	BS6I-ND
Batt Clip	1	D-Sub 25 Pin Male-Female Cable	Digi-Key	AE1012-ND
LPT Cable				

NOTE: Do not omit socket SO1 for the 74373 latch chip.

Updated May 8, 2005

PSX200 Programmer Assembly Instructions

Before starting assembly please read the following instructions completely. Note that the ZIF socket should be installed as the last step!! Note the ZIF socket and power indicator LED mount on the SOLDER SIDE of the board – all other components mount on the COMPONENT side of the board. All holes should be cut in the plastic enclosure before soldering any parts on the board. Note the ZIF socket requires spacing and should not sit flush on the board when using the SerPac plastic enclosure. The easiest way to extend the ZIF socket height is to use machined SIP sockets on the board and plug the ZIF socket into the SIP sockets. Tiny screws and nuts can be used to secure the ZIF socket in place. Another option is purchase individual extension pins and solder everything in place while the ZIF socket is held in place with screws at the proper height to extrude through the plastic enclose. The enclosure is easily trimmed by drilling holes and cutting with hobby knifes and saws.

Construction Steps

1. The first step is to cut a whole for the ZIF socket. Temporarily mount the blank PCB in the enclosure using screws to mount the PCB. The four PCB mounting holes require enlarging with a drill to allow room for the mounting screws. Use a small bit to drill two pilot holes for the ZIF socket through the face of the enclosure. The two pilot holes are located at each of the 28-pin socket mounting position. Note that the ZIF socket and power indicator LED mounts on the BOTTOM side of the PCB. The ZIF locking handle should point away from the DB-25 connector end. Using the pilot holes as reference points, measure and cut the appropriate sized hole such that the ZIF socket will fit through the cutout and rest in the 28-pin holes on the board. Do not install the ZIF or SIP sockets at this time.

2. Measure the LED location and drill a hole for the power indicator LED. I inserted a needle through the LED lead holes on the PCB to mark reference points in the faceplate plastic as a drilling guide. Drill the proper size hole for the power LED and ensure the LED and ZIF socket extend through the face of the enclosure while resting in the pad holes.

3. Trim or file the mounting tabs on the power switch such that it will fit into the PCB board mounting holes. Measure and cut a small slot for the power switch in the enclosure. Optionally you may want to omit the slide switch and use a small toggle switch with wires that run between the board and switch. The mini slide switch was selected to reduce assembly cost.

4. Install and solder the power barrel connector on the PCB. Cut and trim the proper size hole in the enclosure to allow access for the power connector.

5. Temporarily mount the DB-25 connector using small 4-40 screws - do not solder the connector on yet. Trim the enclosure to allow for access of the parallel print port cable connector. At this point all holes should be cut in the plastic enclosure.

6. Next, mount all of the components for the power supply. This includes the switch S2 (or wire switch leads), rectifier B1, capacitors C1-C3, resistor R2 and regulator IC2. **Do not install pull-up resistors R1, R3, R4 and R5 until after final assembly and proper operation is confirmed!**

7. Secure the screws on the DB-25 connector and solder all pins. At this point all components except the ZIF socket and power indicator LED should be installed on the board. Check the enclosure fit for all components and trim as needed.

8. Next temporarily mount the board back in the enclosure with screws. Cut two 14-pin sections of the SIP header socket and plug these onto each side of the ZIF socket and check for proper mating on the board. The ZIF socket should protrude high enough to allow for complete movement of the ZIF socket locking handle.

9. Find two tiny screws to secure the ZIF socket to the PCB. You may want to carefully enlarge the holes in the ZIF socket holes with the next larger size drill bit. Use extreme caution when enlarging the ZIF socket mounting holes with a drill as the ZIF mounting tabs are brittle and break easily! Make sure any screws, washers or spacers do not short any traces on the board. You can use plastic or fiber washers if needed to prevent shorting of any traces. One the ZIF socket is properly aligned and mounted solder the SIP socket pins in place.

10. Remove the PCB and correctly orientate the LED (cathode lead goes to ground) and insert the leads on the board. Reinstall the PCB, locate the LED at the proper height and solder the LED leads on the board.

11. Power up the board with no IC's or parallel cable attached. The LED should glow when the power switch is turned on. Measure the IC1 supply pin for proper 5V supply voltage. If the LED does not glow check the leads for proper orientation. Install the 9V battery clip and reinstall the completed PCB board in the enclosure. At the point assembly should be complete and ready for testing.

Important Notes!

The pull-up resistors R1, R3, R4 and R5 are optional components. These may be added to help prevent glitches on the control lines of the X2212 chip during insertion/removal. However, in some cases these have caused problems and the programmer will fail to read and write data depending on the chips and the computers parallel port. Therefore, these should only be added after proper operation of the programmer has been verified. You may wish to increase these to values and some experimentation may be required. Avoid using the 74HCT373 latch chips, if possible, in favor of the SN74LS373N part.

**** NOTE ****

DO NOT OMIT OR SUBSTIUTE IC SOCKET SO1 FOR THE 74373 LATCH CHIP IC. This socket contains an integrated 0.1uf 50V bypass capacitor needed at the chip. Failure to properly bypass the chip supply pins could result in erratic behavior.

Using the Programmer

Note the required position for each type of EEPROM as shown below. Improper chip insertion may damage your computers printer port, the programmer and/or EEPROM's. Always observe the following when using the programmer:

1. Never insert both types of EEPROM's into the programmer at once.

2. To prevent damage, always double check for proper IC insertion before applying power to the programmer.

3. Always remove power before installing or removing EEPROM's in the programmer. Never remove an EEPROM with power applied to the programmer or data corruption may result.

4. Use a short printer cable with the programmer of four feet or less. In most cases a six foot cable will work but some machines may have programmer write problems with long cables.