

How to use the Willem epromprogrammer version 3.0, 3.1, 3.1 ATH, 4.0, 4.1, 4.5.

update 15-10-2005



Board 4.0

The 3 pole normal/29X040 header is now called Vpp/A18,19.
Standard setting: Vpp, for 29F040,29C040 and for the 27C080(801) A18,19.

The SF erase header is now 3 pole and has 2 positions : normal and erase.
Standard setting is normal.

For DIP 24 chips there are 2 new headers Normal/DIP 24 and Vpp/A11.
Standard setting is normal and A11.

For DIP 24 chips set jumpers to: from Normal to DIP 24, 2732 -> A11, 2716 -> Vpp.

For the HUB/Firmware socket there is one Vpp header.
Standard settings open, closed for Intel 82802 chips

To set Vcc and Vpp there is a 4 way DIP switch:
1 and 2 are for Vpp: 1 ON Vpp=21 volt, 2 ON Vpp= 12.6 volt
Standard setting 1 OFF, 2 ON Vpp=12.6 volt.

updated resistor values

I've changed the voltage regulator precision resistors a bit and use vrvpp now.
(Board 4.0)

This makes 3 Vpp voltages possible: 12.5, 21 and 25.

If you don't need 25 volt you can leave it as it is of course.

vrpp = 6K49

vpp1 = 5k65

vpp2= 26k1

You can use other values within a +/- 3% range, just check with your Voltmeter.

To get the 30 volt or so input voltage you need for 25 Vpp 25 volts, you can use 2
12 volt adapters in serial. There will be a small board in the shop soon for this
purpose.

For the Vcc regulator I use about 320 ohm instead of 330 now, this makes Vcc a bit
higher. (Board 4.1 and 4.5)

vrcc = 1k24

3 and 4 are for Vcc: 3 ON Vcc=5 volt, 4 ON Vcc= 3.3 volt, 3 OFF and 4 OFF Vcc=6.0 volt.

Standard setting 3 ON and 4 OFF Vcc=5.0 volt.

Vpp and Vcc voltages can be modified easy with different resistor values.

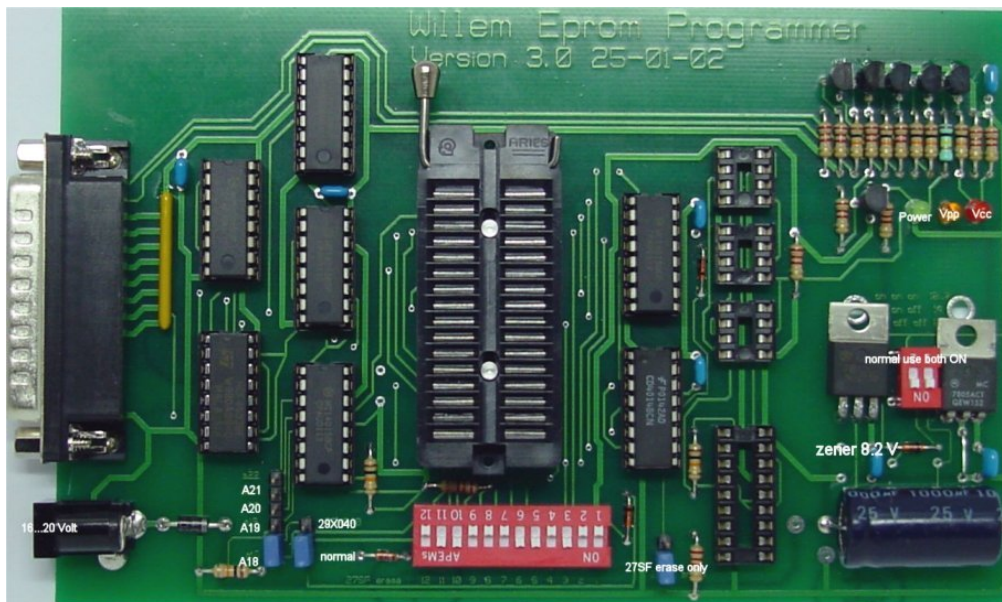
For low voltage flash devices the 3.3 volt setting can be used, in that case voltage drop diodes on adapters must not be used of course.

On the tsop 48 adapter short the 5 volt jumper.

For the Firmware/HUB adapter set to 5 volt. Sometimes it's necessary to increase R/C delay time:

Set it higher until the chip ID is correct.

The ICSP connector is for external PIC chips programming.



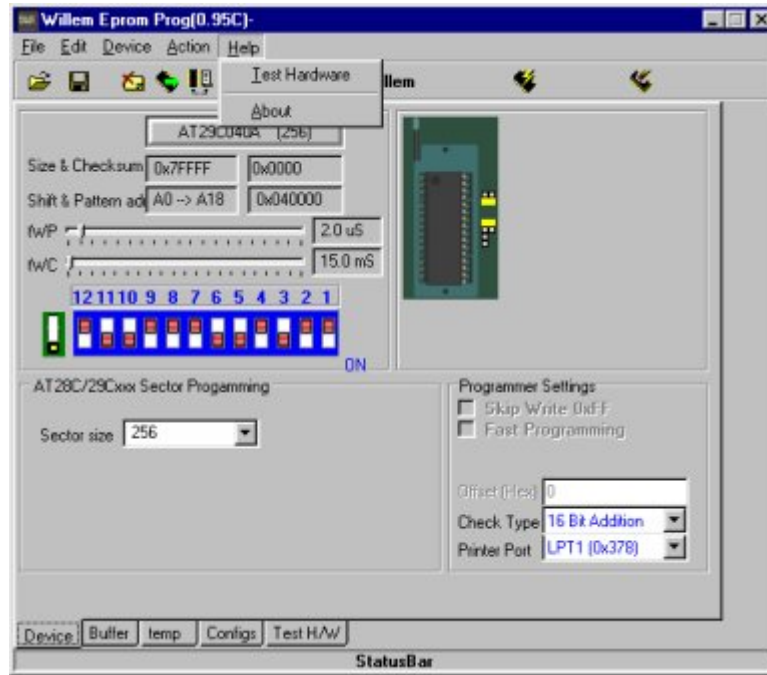
Board 3.0/3.1, 3.1 ATH, 4.0 and 4.5.

Set the jumpers to A18 and normal (on boards 4.0/4.5 called Vpp) for standard use.
 Set the jumper to A19 for XXX080 devices.
 Set the jumper to 29X040 (on boards 4.0/4.5 called A18,19) for the 29F040, 29C040 and for the 27C080 (801)
 A19, A20, A21 are used to connect to the TSOP 48 adapter.
 For connection details see the [tsop page](#) .
 A19, A20, A21 are also used to connect to the 16 bit 42 pin adapter (27C400..27C322).
 For connection details see the [16 bit combi adapter page](#).

Close the 27SF erase jumper only to erase SST27SFXXX devices.

The power supply can be a standard "12 Volt adapter" 300-500 mA **unstabilised** that gives about 16 volt. This is not critical output voltage can be between 15 and 20 volt.

The two DIP switch should be both ON, you can select Vpp 21 volt if the 8.2 Zener diode is mounted:
 OFF ON. Supply voltage must be 24 Volt min. for 21 Volt operation.



Check the printerport setting in the BIOS, it should be EPP or Normal
 Also check or there are resident programs active that use the printerport, like TWAIN drivers. You may have to remove them.

XP can also give problems when you connect your programmer see [XP polling problem](#)
 It's highly recommended to do this registry update if you use XP,
 Eprom's can be changed(written to) during a read or verify.

Connect to the printer port with a 25 SubD cable, the cable should not be longer than 1.8 meter(6 feet standard cable).

This must be a fully wired 1:1 cable, a null modem or serial cable won't work.

Connect the power supply, the power led must go on.

Make sure that the PORTIO drivers are in the same directory as the main program.

Some driver problems may occur under Windows 2000:

* first, delete an entry in the device manager as follows:

1. On the Start Menu, click Start --> Settings --> Control Panel.
2. In the Control Panel, double click the System icon.
3. In the System Properties window, click the Hardware tab.
4. On the Hardware tab, click the Device Manager button.
5. In the Device Manager menu, click View --> Show Hidden Devices.
6. In the device list find the Non-Plug and Play Drivers entry. Click the 'plus' sign on the left of the entry to expand the list.
7. Find the dlportio entry and right-click it. Click on Uninstall in the context menu that appears.

If it is not there already, then no problem carry on.

* In the registry, I deleted entries that had to do with dlportio.

Search for dlportio and delete any folder that refers to it.

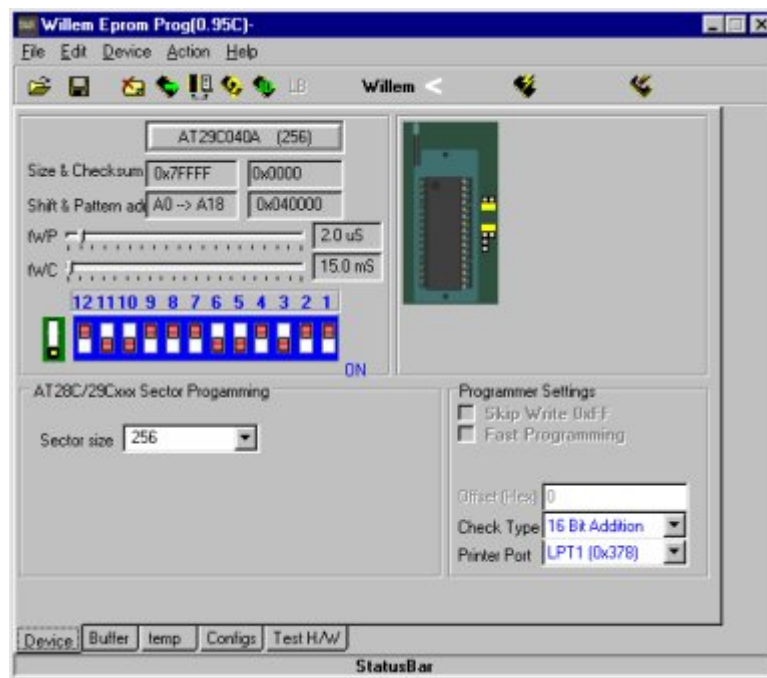
I think this just removes any OS reference to dlportio, so like you are starting fresh.

* [download TLDPortIO from the web](#)

* install the drivers using the utility--play around with it a bit--the point is to get the DLL and SYS file installed in the system and start a service.

* notice that with the driver files installed, and the driver files in the director that willem97g is in had better be the same.....and that the burner software still requires the DLL and SYS file in the same directory

Thanks to sadolph.
Test the connection with TestHardware



In the program set to 'Willem' (only needed with first use)
Not needed for the 3.1ATH or 4.0/4.5 boards.(the 'Willem' setting only changes the DIPswitchsetting picture)

Select device type and set the DIPswitch .

DIPswitch switches can be red(like in the software),white or other colors.

Insert chip and check ID.(not possible with older 27(C)XXXX devices)

If you can't get a valid chip ID it's useless to try reading,erasing or writing.

A valid ID gives the right manufacturer and chip type

Erase if necessary,load program file and program,the Vcc led will light and with 27,28 devices the Vpp led also.

Warning: never insert an eeprom when you haven't started the program yet and the Vpp and Vcc leds are still burning.

Never remove the power supply lead or disconnect the adapter when an eeprom is still in the socket, also make sure the power lead is firmly connected to the board and can't become disconnected.

All of this can cause random "writes" to your eeprom and change it's contents.

Programming can fail in different ways:

First byte, error message: error at 0x000000 Buffer=0xXX ,Chip=0xFF or 0xXX.

Causes: chip not inserted right,faulty chip, Vpp too low, Vcc too low or Vcc too high.

Random error, error message: error at 0xFFFFFFFF ,Buffer=0xXX ,Chip=0xXX

Causes: 27CXXX eeprom not completely UV erased,tWP/tWC too low,other causes.

Normally you should not change tWP and tWC unless you know what you are doing.

If you get random write errors with 27(C)XXX eeproms try higher settings.

Most older NMOS eeproms like the 2716 need higher settings.

In the Buffer section you can see the contents of your program file or the chip if you have done a chip read.

The configs section give an overview of all settings and parameters.

If you need PIC in circuit programming, you can use a DIP connector for the 18 pin PIC 16F84 socket(5 gnd.,12 clock,13 data i/o,14 Vcc).

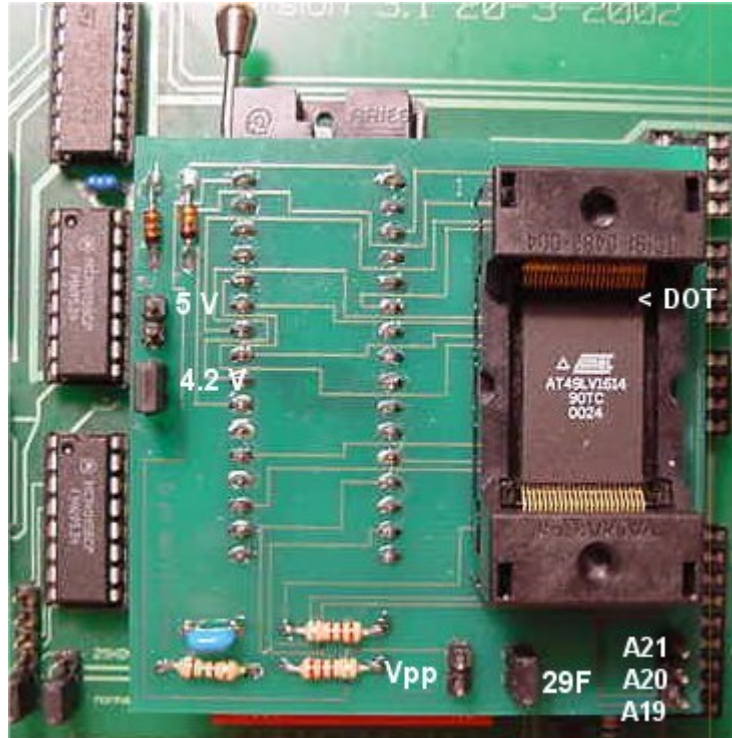
The Test H/W section is for testing purposes,see the [debug hardware page](#).

TSOP 48 adapters

Yamaichi and Wells ZIF versions

update 15-9-2003

The tsop 48 adapter supports 29F(LV)and 28F tsop 48 chips and compatibles(like the AT49LVXXXX or 58FVBXXX)that can be programmed in BYTE mode



These are top load ZIF's:

Put the chip in the ZIF from above.

Push both load buttons together, the chip will be centred.

Release both buttons together, the contact strips should get on the chip pins (lay on the horizontal ends)

Use a magnifying-glass to check when needed.



Remember TSOP chips are not designed to be used in a ZIF.

Select 29F and/or Vpp, close jumper for 5/4.2 Volt operation, leave open for 3.3 Volt.

29F(LV)800 connect A19 to A19 on programmer board

29F(LV)160 connect A19 and A20 to A19 and A20 on programmer board

29F(LV)320 connect A19,A20 and A21 to A19,A20 and A21 on programmer board

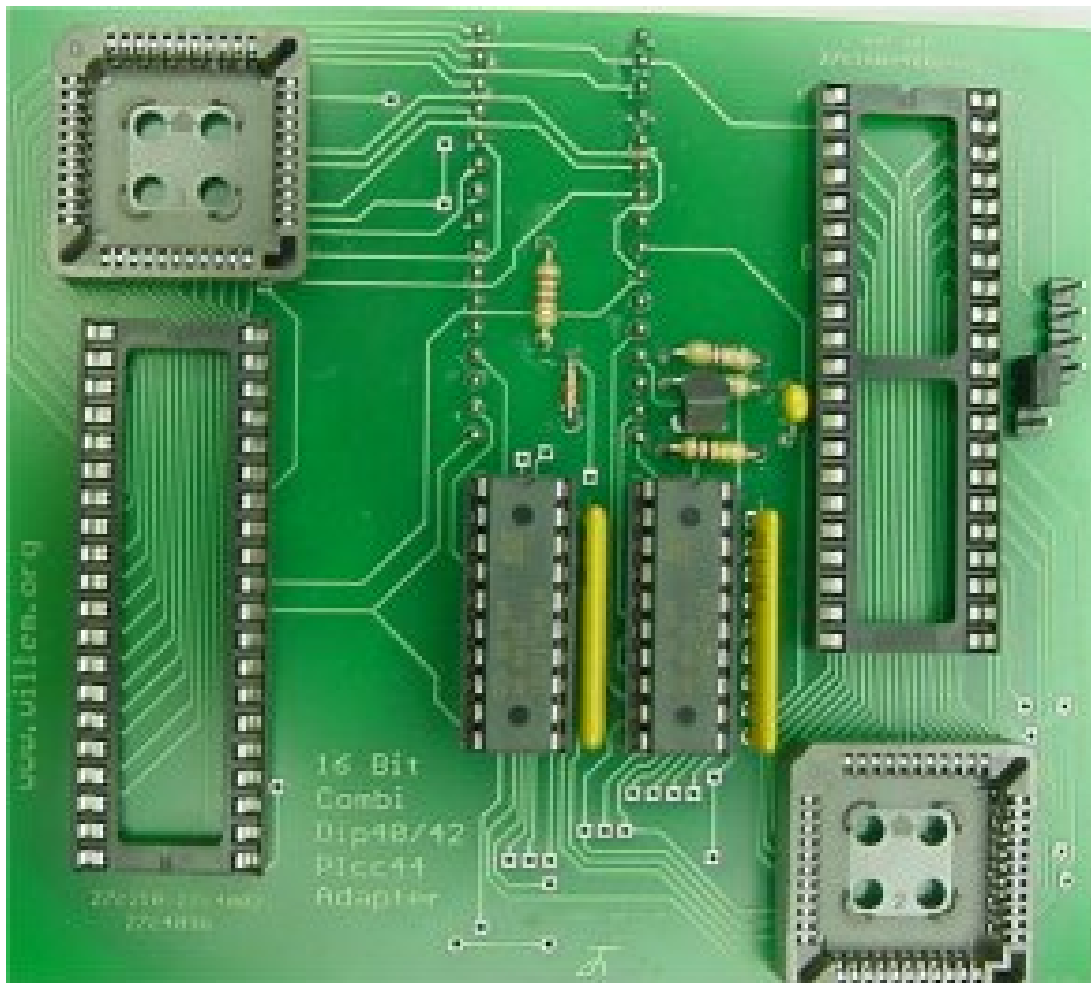
It's easiest to use a 3 way connector cable (comes with the adapter)

http://yamaichi.us.phtemp.com/pdf/t&b/ic191_tsop.pdf

<http://www.wellscti.com/catalog/series648.pdf>

16 bit DIP40/DIP42 PLCC44 combi adapter

update 20-9-2003



This adapter supports 16 bit DIP40/DIP42 and PLCC44 27C1024, 2048, 4096, 4002, 27C400, 27C800, 27C160 and 27C322 eproms.

For the 27C800, 160 and 322 you have to connect extra address lines from the programmer board. Use the 3 way connection cable.

Set to A21 for the 27C322.

This adapter will also become available with a 40 pin and/or 42 pin 3M ZIF socket, prices on request.

XP polling problem

Sometimes when you connect the programmer and start up the program after a few seconds the Vpp and Vcc leds suddenly light again. This is Xp trying to find out what is connected to the printerport, if you do 1 or 2 hardware check or read actions XP gives up and you can proceed as normal. To prevent this add this registry setting:

Windows Registry Editor Version 5.00

```
[HKEY_LOCAL_MACHINE\SYSTEM\ControlSet001\Services\Parport\Parameters]
"DisableWarmPoll"=dword:00000001
```

Debug Hardware

update 24-09-2004

This page is about eprom programmer versions 4.0, 4.5, 3.1 PCB3B from Gitti Ieo is much the same but there are also a lot of differences. The voltage regulator section is totally different:3.1 uses a 7805 and 7812 regulator,Vpp 21 and 25 volt can be selected with zener diodes in the 7812 gnd line. Pcb3b uses a MC34063A to generate different Vpp voltages. The jumper configuration is also different.

Visual inspection

After you have completed your programmer board do a thorough visual inspection. This is very important: lots of problems are caused by bad solderings, small shorts, bended parts and so on. Use a strong light source and a magnifying-glass.

Checking the voltage regulators and power lines

Connect the power supply, the green power led should light if not try to reverse polarity.

Check or 12,7 volt is present at the 7812 output pin,if one of more zener diodes are mounted you can also check or Vpp=21 volt by switching the 2 way DIP switch. Power supply voltage must be 24 Volt min. for this check. If Vpp is too low, 20.5 volt for example you can mount one or more (serial) 1n4148 standard diodes in pos. Z2 in the **opposite** direction. If you want to use Z2 for the 3.9 Zener diode mount the 1n4148 serial with the 8.2 zener, you can also use a 9.1 zener instead of a 8.2 type.

The 7805 output voltage must be 5 volt of course.

Check all IC's or they have Vcc 5 volt, the Vcc pin is 16.(4049 pin 1)

If the 7805 output is not 5 volt but zero and gets warm there must be a short somewhere, if the voltage is lower than 5 volt and gets warm it's most likely a chip mounted in the wrong direction, this chip will also get warm.

With 4.0 and 4.5 boards it's a bit different:

The 4.0 board use 2 LM317's that are set with several precision resistors and a 4 way DIPswitch.

The 4.5 board uses a 7812 with a fixed 12.6 volt output and a LM317 with precision resistors.

Testing your programmer

Connect your programmer board and start up the software as described in the [programmer manual](#).

If Test Hardware fails check or the power supply and the connection cable are properly connected.

You can also try to set to lpt2 or lpt3,it's possible that your PC uses one of these printerport addresses even if your system has only one printerport(you can also check this in the BIOS setting).

If the Test still fails you can try to follow the test signal through the circuit: go to the Test H/W section and check "serial out (D0 pin 2)", normally "serial in (/Busy pin 11)" should become '1' but if the test fails it stays '0'.Vcc will also be switched on.

Start at D-Sub pin 2 and check or the voltages changes between 0 and 5(3..5V) if you check and uncheck "serial out(D0 pin 2)".If nothings happens there is a problem with the connection to your PC.

If the signal change is ok follow the signal in the same way through 4049(Pin 14->pin 15), (the signal is inverted now!), transistor BC549 Q6 and Q5 (the signal will be inverted again twice) and through 4049(pin 9-> pin 10) until you have found the problem.

4049 pin 10 is connected to D-SUB pin 11, if the signal change is ok here it must be a connection problem to your PC.

If Test Hardware is ok you can continue with other tests.

It's important to understand that Test Hardware says nothing about the parallel eprom(DIP 32) section of the programmer, Test Hardware uses the serial devices circuit.

At this point you can try to program an eprom, it's best to use an 28F010 or 020. The whole programmer hardware and Vpp will used this way and you can easily erase the chip with the programmer.

But you can also use eproms like a 27C020 or 29F040 of course. The test eprom must be empty of course.

If the Blank check fails and you are sure that the eprom is empty there must be a problem in the reading section; see below how to test it.

Load a file that fills the whole buffer to use the whole device address range. Use a file with lots of contents, a big *.zip file is perfect. Check device ID and Program if that works and Verify is ok too your programmer has passed the test. As an extra you can test the address lines that are above your test eprom address range, but normally that will be ok.

If programming fails you'll have to do more tests to locate the problem.

If programming fails at the first byte there can be different causes.

A failure at the same address every time like "error at 0x040000 buffer=0xXX, chip=0xXX" is caused by an addressing failure in this case A18(pin 31 or pin 1)

A random error, can be caused by a poorly UV erased chip or tWP maybe too low, there can also be other causes like instability in the voltage regulator.

First set the DIP switches as shown in the Test H/W section (the DIP switches are not shown in the reversed "Willem" direction here). Using the Test H/W function is not difficult: in 'ZIF 32PIN' check the boxes one by one and use a voltage meter to measure or you get logic 1 (normally 5 volt, A9 (pin 26) is lower because of the erase circuit, 3..4 volt)

You can find shorts to measure signals next to the one that is logic '1'.

For example: if you check A5, A4 and A6 should stay low.

To test the 4014 read function check and uncheck OE so that D0...D7 are "greyed out", you can now apply a logic 1 (VCC 5 volt) or 0 (ground) to the different data inputs on the programming ZIF socket (pin 13,14,15,17,18,19,20 and 21). Use the "Read Data" button to test, all inputs at VCC should read 0xFF, all inputs grounded 0x00 and all values between. You only need to test the 8 different data inputs of course.

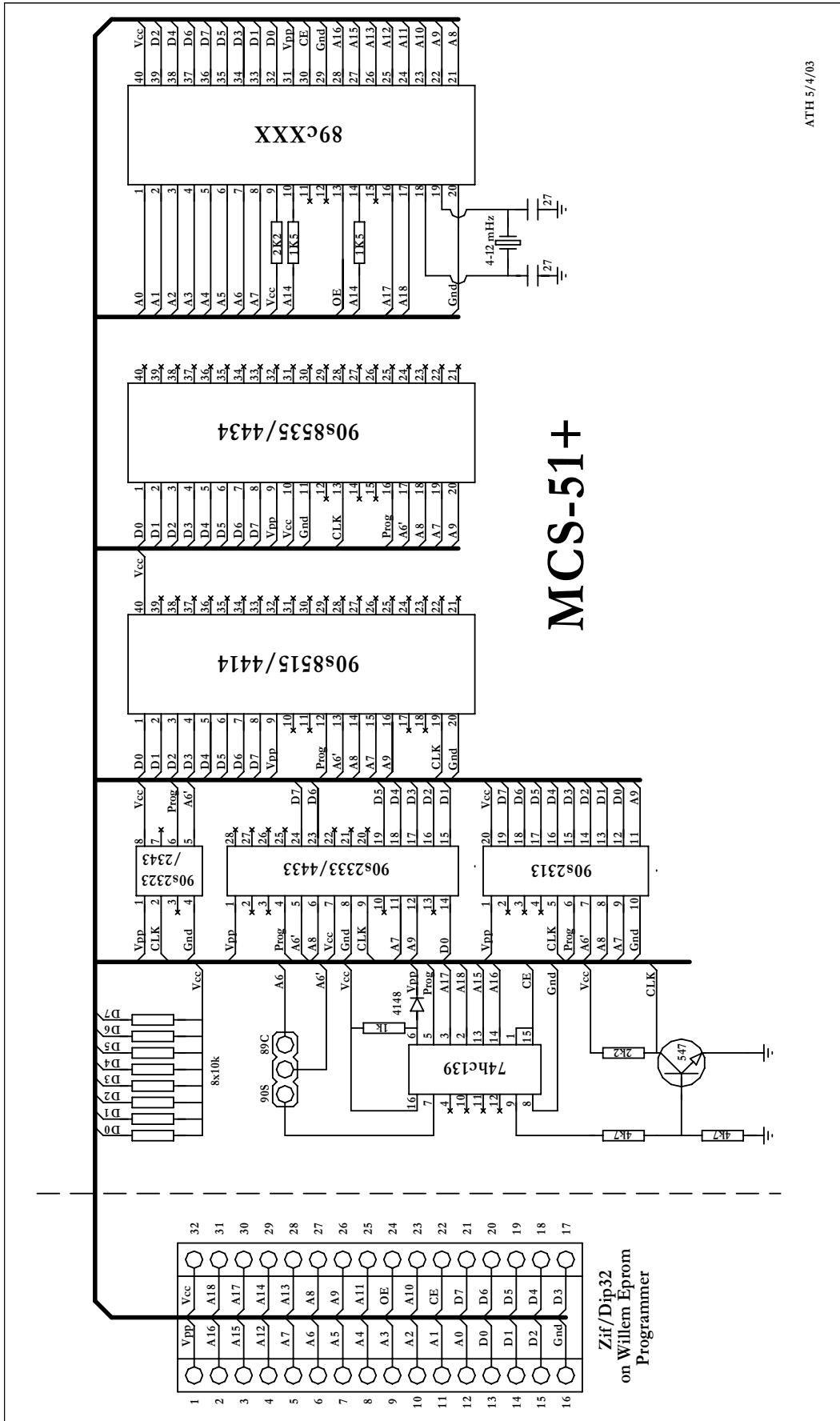
Device types supported

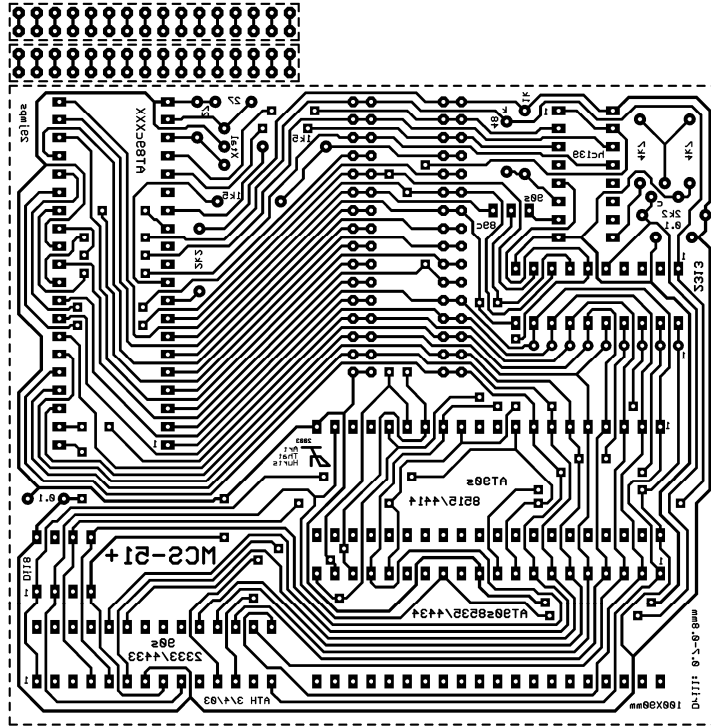
EPROM	27C64, 27C128, 27C256, 27C512, 27C010, 27C020, 27C040, 27C1001 M27C1001, M27C2001, M27C4001 27C080 (A19) ,M27C801,M87C257 2716(Vpp25V),2732 , (adapter DIP24) 2764, 27128, 27256, 27512, 27010, Vpp12.5V (21Vpp Modify Circuit)
EEPROM	28C65,28C64, 28C128, 28C256,28C512, 28C010, 28C020, 28C040 M28C16A/17A (DIP28) (Adapter or Jumper) 28C16,XLS2816 (DIP24)
FLASH Memory	28F64, 28F128, 28F256, 28F512,28F010, 28F020 MX26C1000, MX26C2000, MX28F1000, MX28F2000 Am28F256A, Am28F512A, Am28F010A, Am28F020A (New command erase/prog.) -- intel --- i28F001BX, 28F004, 28F008, 28F016
FLASH Memory	29F64, 29F128, 29F256 , 29F512,29F010, 29F020, 29F040, 29F080 29F001,29F002, 29F004, 29F008, 29F016, 29F032
Serial (I2C) EEPROM 24Cxx	24C02,24C04,24C08,24C16, 85C72, 85C82, 85C92 --- page write ---- 24C32,24C64,24C128,24C256,24C512
Microwire EEPROM	<----- Data 8bit -----> (pin 6 ->ORG. [Schematic connect to GND]) 93C06, 93C46, 93LC46, 93C56, 93C57, 93C66, 93C76, 93C86 (8bit), AT59C11, AT59C22, AT59C13 CAT35C102, CAT35C104, CAT35C108 (pullup pin7) <-----Data 16bit-----> (pin 6 ->NC [No Connect]) 93C06A ,93C46X,93C56,93C66,93C76,93C86 (NS)
MicroChip PIC	16C84, 16F84, 16F84A ,16F627/16F628 12C508/A, 12C509/A, 12CE518, 12CE519, 16C505 16C620 16C621, 16C622, 16CE623, 16CE624, 16CE625, 16C710/711 PIC 16F818/819 ---ICSP connector---- 16F870, 16F871, 16F872, 16F873, 16F874, 16F876, 16F877 PIC16F873A, PIC16F874A, PIC16F876A, PIC16F877A
Atmel Flash Memory (Sector Programming) (Software Data Protection)	AT29C256, AT29C512,AT29C010A, AT29C020, AT29C040,AT29C040A W29EE512,W29EE011, W29EE012, W29C020(128),W29C040 PH29EE010(W29EE011) ASD AE29F1008 , AE29F2008 Ver 0.992 up(DOS). Can run under win9x (disable prog. CPUIdle or CPUCool)
Atmel Flash Memory AT49Fxxx (Subset 29Fxxx) (Byte-by-Byte Programming) (Software Data Protection)	Command seq. 5555/AA, 2AAA/55, 5555/A0 AT49F512, AT49F010, AT49F020, AT49F040 SST39SF010, SST3S9F020 ,SST39SF040 AT49F001,AT49F002 , AT49F008A Command seq. 555/AA, 2AA/55, 555/A0 Am29F512, Am29F010, Am29F020, Am29F040,HY29F080 29F002, 29F002T, Pm29F002T
Serial Peripheral Interface (SPI)	[Atmel] AT25010,020, 040 (A8-A0) AT25080, 160, 320, 640, 128, 256 (A15-A0)

EEPROM Mode0 (0,0) AT25xxx, W95xxx	[ST] W95010....256, Microchip 25x010 - 25x640 --- Byte programming 25010,25020,25040 --- Page programming 25C080,25C160,25C320,25C640,25C128,25C256,25C512 AT25HP256,AT25HP512 AT25HP1024 (24bit address) -- CAT64LCxxx (16bit DATA IN/OUT) use Socket 93Cxxx CAT64LC010, CAT64LC020, CAT64LC040
Atmel EEPROM (page prog.) (Software Data Protection)	AT28C256 , AT28C010, AT28C040
Nonvolatile SRAM (DS12xx)	DS1220,DS1225Y, DS1230Y/AB, DS1245Y/AB, DS1249Y/AB
static RAM (Test RAM)	6116, 6264, 62256, 62512, 628128
EPROM winbond,SST Electrical Erase Chip	W27E512 , W27E010 , W27C010 , W27C020 , W27C040 SST27SF256 , SST27SF512 , SST27SF010 , SST27SF020 MX26C4000 Vcc = 3.3-3.6V SST37VF512 , SST37VF010 , SST37VF020 , SST37VF040
Flash Memory SST,Sanyo	SST28SF040A ,LE28F4001
Adapter	
Atmel AT89Cxx (MCS-51) Adapter 32pin to MCS-51	Atmel Auto Select AT89C51,52,55, AT89LV51,52,55 AT89S8252 (8K+2K), AT89S53, AT89LS8252,AT89LS53 AT89C1051,AT89C2051,AT89C4051 (20pin) AT89C51RC (32KB), AT89C55WD (6.2V) AT89S51, AT89S52 SST89C54/58, SI89C52 Intel Auto Select i87C51, i87C51FA, i87C51FB ----- i8xC51,i8xC52,i8xC54,i8xC58 (tWP = 100uS*25 Pulse)
Atmel AVR 8-bit RISC AT90Sxxx (Parallel programming) Adapter 32pin to MCS-51	(read,write,erase,verify,checkempty,Lockbits ,Fusebits) [Flash memory/EEPROM] AT90S1200,AT90S2313 90S2333 , 90S4433 , 90S4414 , 90S8515 , 90S4434 , 90S8535 reference AT90S2313 pin Function Lockbit read AT90S2313 Errata Sheet.pdf
MCS-48,MCS-41 Adapter 32pin to MCS-48/41	ROM (read/verify) P8048AH, P8049AH,P8050AH, P8042AH Vea = 12V P8041, P8042 OTP (read/verify/Progam) P8748,P8749H,P8742H Vea = 18V EPROM (read/verify/Progam) D8748,D8749,D8742, D8741, D8742 Vea = 18V
FLASH memory 8/16bit (Software Data Protection) Adapter (TSOP48)	Am29F400,Am29F800,29F160,29F320 (read,write byte mode) HY29F200, HY29F400, HY29F800 , AT49F2048A, AT49F4096A, AT49F8192A
FLASH memory 8/16bit (Vpp12V) (Software Data Protection) Adapter (TSOP48)	i28F200,i28F400,i28F800,i28F160 (TSOP48) 28F001(DIP32 or PLCC32)
EPROM 16bit (DIP40) (1-	27C1024 (27C210), 27C2048 (27C2002), 27C4096 (27C4002),

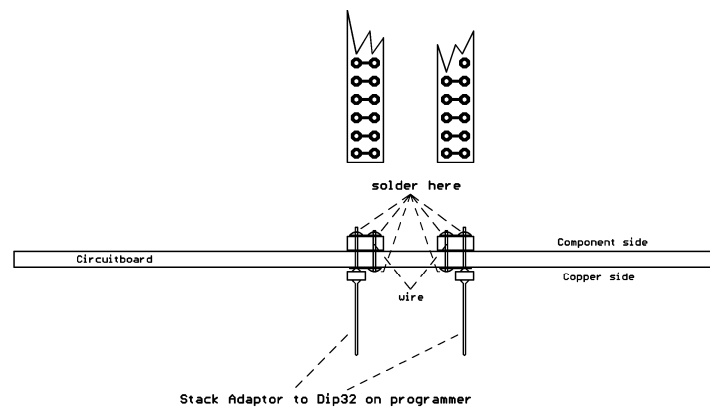
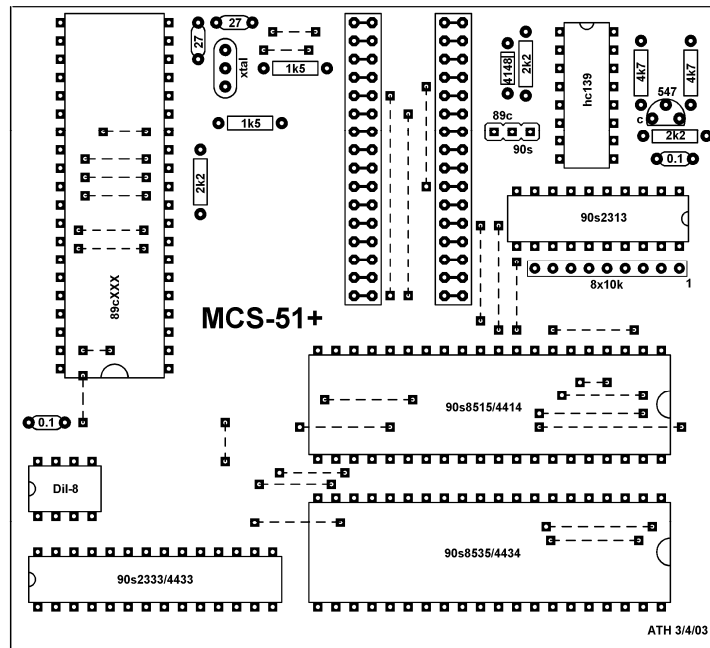
4Mbit) Adapter Eprom 16bit Eprom only	Schematic by Toomas Toots (read,Program byte mode by use Resister pull up Data Bus (0xFF), A0 select low or high byte)
EPROM 16bit (DIP42) (4-32Mbit) Adapter Eprom DIP42 Eprom only	M27C400(DIP40), 27C800, 27C160, 27C322 Schematic by Toomas Toots (read,Program byte mode by use Resister pull up Data Bus (0xFF), A0 select low or high byte)
FLASH memory 8/16bit (Software Data Protection) Adapter (TSOP48LV)	29LV200, 29LV400,29LV800,29LV160,29LV320 (read,write byte mode)
Firmware Hub / LPC FLASH Adapter Firmware Hub/LPC (PLCC32) (PP mode) (3.3V)	-- Firmware Hub 82802AB, 82802AC, AT49LW040, AT49LW080 SST49LF002A, SST49LF003A, SST49LF004A, SST49LF008A W49V002FA, W39V040FA -- LPC flash SST49LF020, SST49LF040 W49V002A, W39V040A
P28F002BC Adapter P28F002BC (DIP40)	BOOT BLOCK FLASH MEMORY - P28F002BC

MCS51 board





Size 100x90mm, adjust if needed !



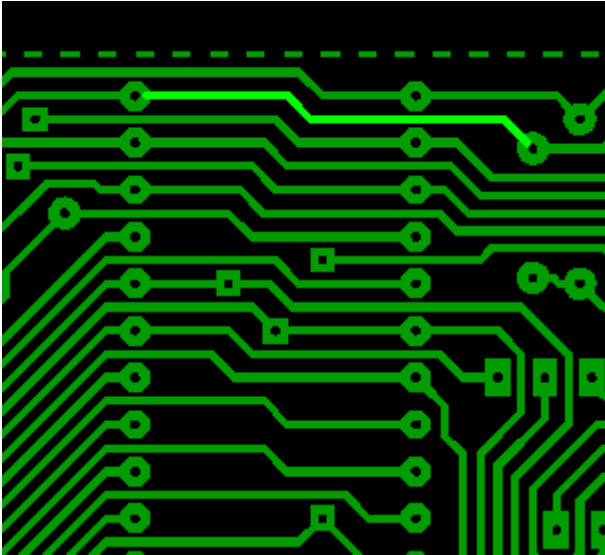
problems with the MCS51+ adapter

There are several problems with the MCS51+ adapter.

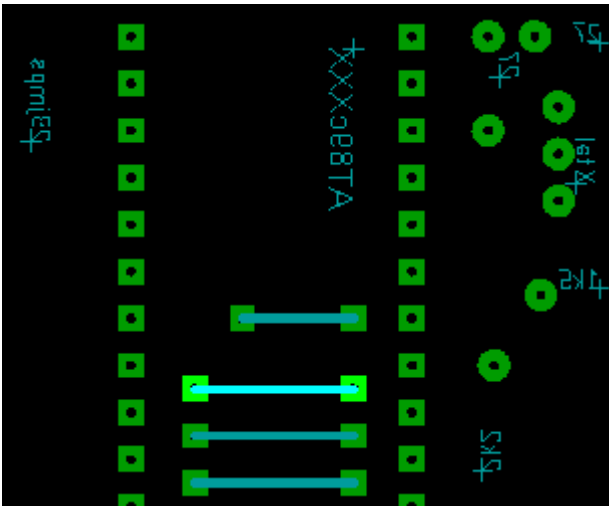
This has only to do with Atmel 89CXXXX series not the AVR types.

It is recommended to add diode D1 and D3, see schematic diagram here:
<http://mpu51.tripod.com/eprom/pdf/mcs51Vpp.pdf>

This is a simple mod with 2 1N4148 diodes, make a cut in the track between Dip32 pin 1 and cathode D2 and mount the diode between these points.



On the bottom side make a cut in the second track from below under AT89CXXXX and mount the diode there.



The 27SF erase 2k2 pulldown resistor on the 3.1 board (double sided) can be too low and cause an error with A9 (0X200), this resistor should be replaced with a 10k type. This is the resistor close to the right of the SF erase jumper. It's also possible to short the diode connected to the A9 (pin 26), but SF erase cannot be used this way.

Sometimes the chip ID of 89C205X types cannot be read correctly, erasing and programming works though.

