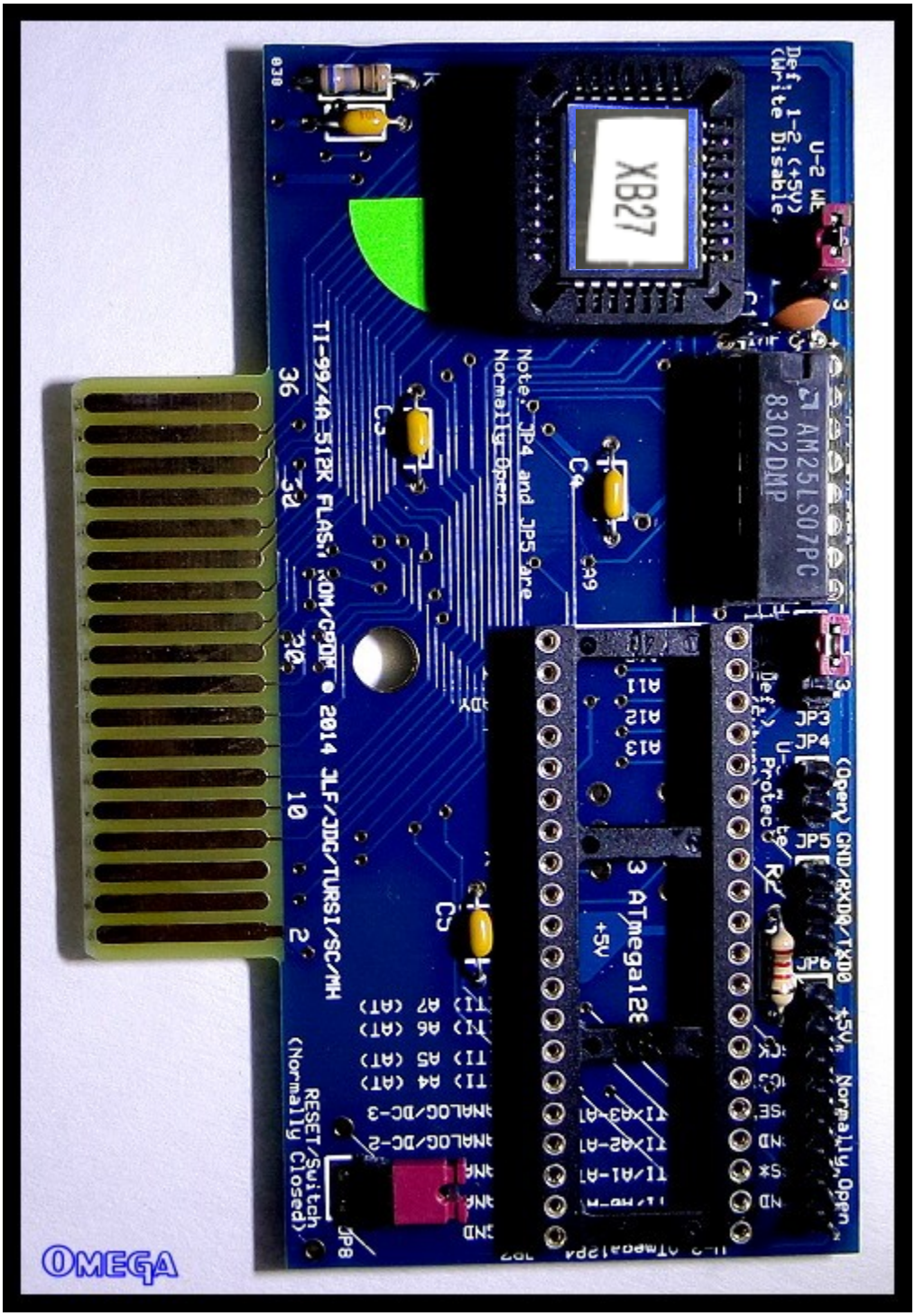
UberCart Programming using the MiniPro TL866A to program the

(ATMEGA1248P AVR and AT49F040 + PLCC32 Socket)

Contact: Ronald van Kleunen

Version: 1.0 (21 Aug 2017)



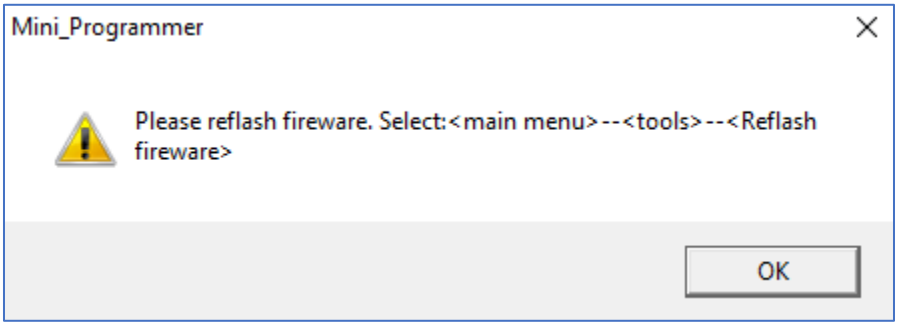
Preparation on the PC

- **Install the software**
  http://www.autoelectric.cn/MiniPro/minipro_setup.rar?Lastvesion660

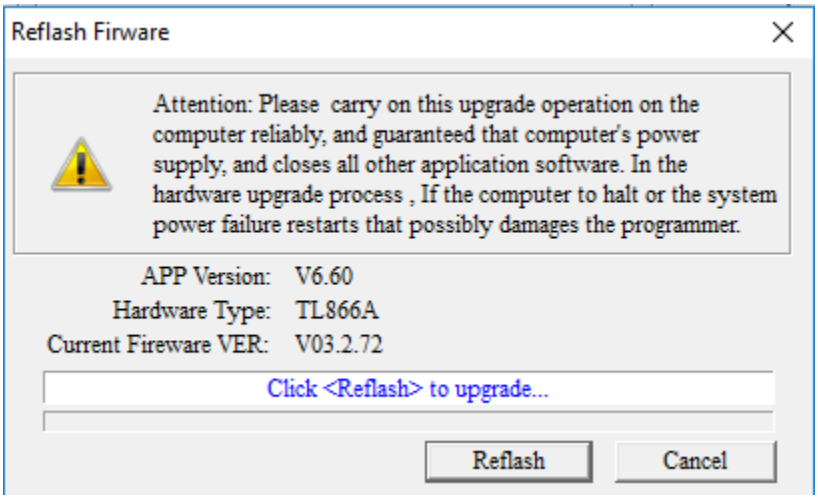
  Latest version 20-Aug-2017 is version 6.60 (版本: V6.60 支持芯片数:14177 --2017.05.09)
  (main website: http://www.autoelectric.cn/TL866_main.html**)**
- **Connect the MiniPro TL866A with the USB cable to the PC**



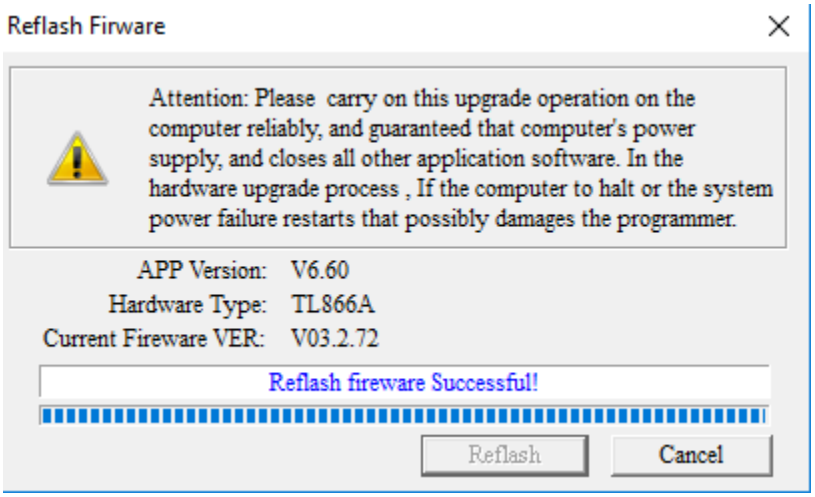
The tool will automatically indicate if a Reflash of Firmware need to be done.

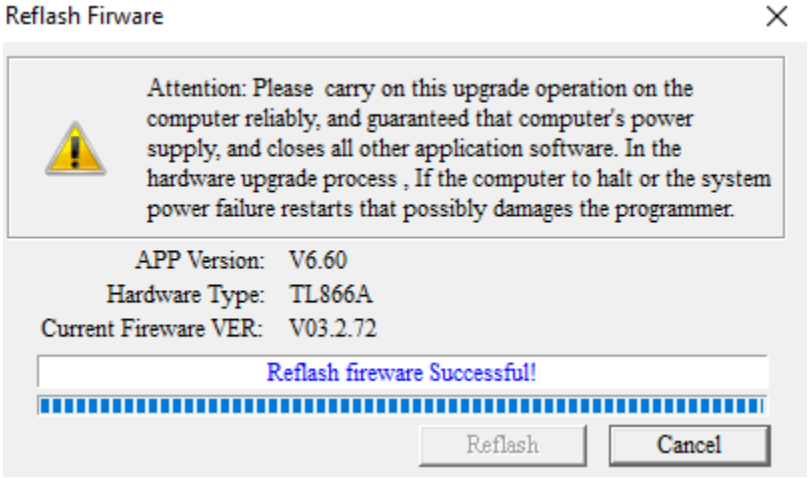


- **Once opened. Tools > Reflash Firmware**



- **Press Reflash**





- **(I closed the Software) and restarted it again. It will not ask anymore the Reflash the firmware**

Part 1 – Programming the ATMEGA1248P Chip

- **Note: if you want to burn the "Rasmus 8-in-1.bin" file, then Part 1 is not needed as this image does not need the ATMEGA1248P on the UberGrom cart to run! It only needs the AT49F040 and go directly to Part 2).**
- **And similar for other .bin files (I tested the EducartsRom.bin it does not need the ATMEGA1248P Chip:** http://atariage.com/forums/index.php?app=core&module=attach&section=attach&attach_id=416108

- Now insert the ATMEGA1248P Chip into the socket of the TL866A and close the socket so that the chip does not move. **Make sure that the Chip is inserted correctly into the right direction (see the indicator on the MiniPro).**
-

The AVR we use is: http://www.atmel.com/images/doc8059.pdf
8-bit Microcontroller with 128K Bytes In-System Programmable Flash ATmega1284P (ATMEL)



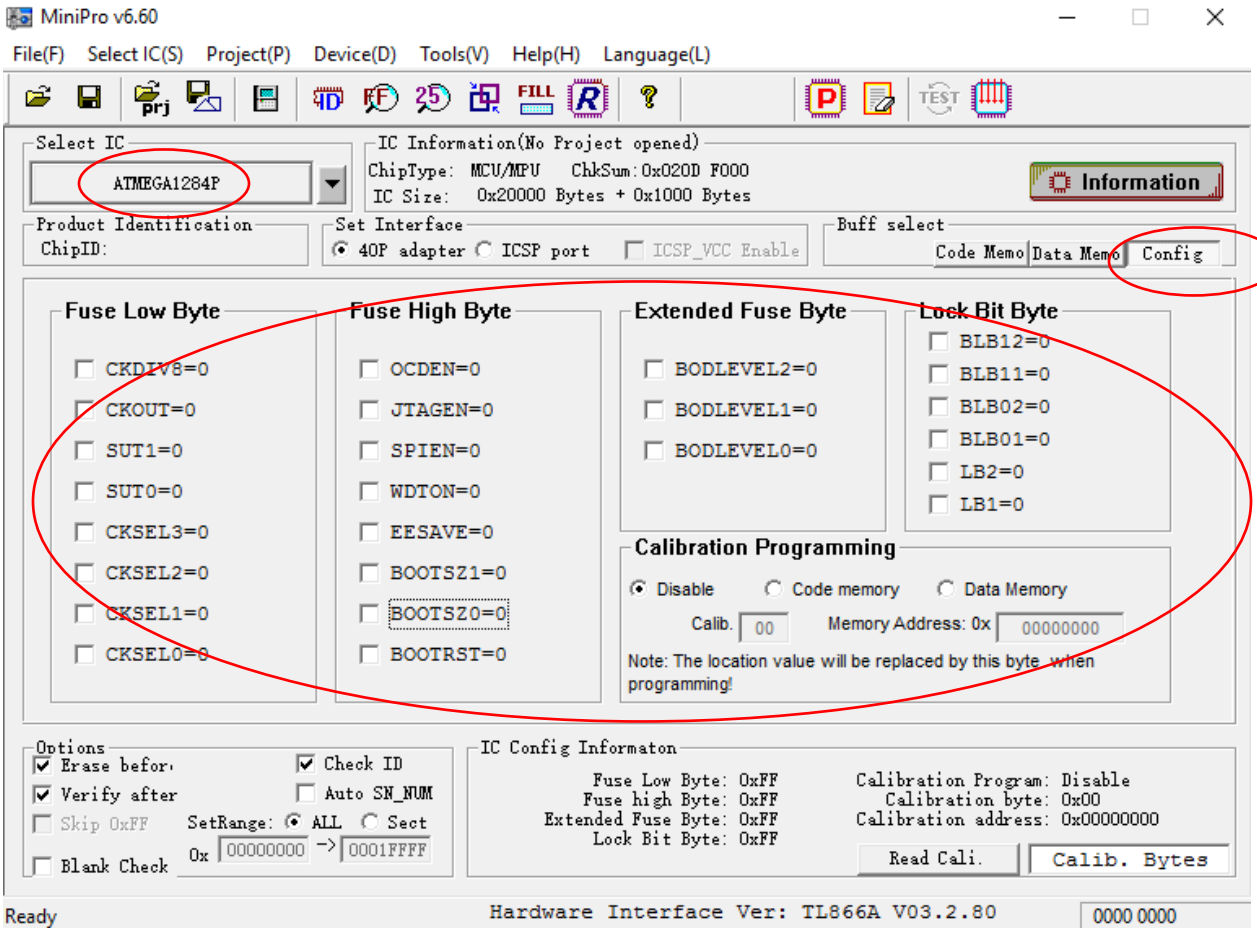
Source: https://en.wikipedia.org/wiki/Atmel_AVR
AVR stands for **A**lf and **V**egard's **R**ISC processor
Atmel AVR:
AVR is a family of microcontrollers developed by Atmel beginning in 1996. These are modified Harvard architecture 8-bit RISC single-chip microcontrollers. AVR was one of the first microcontroller families to use on-chip flash memory for program storage, as opposed to one-time programmable ROM, EPROM, or EEPROM used by other microcontrollers at the time.

The following instructions come from the Great Gazoo .pdf document

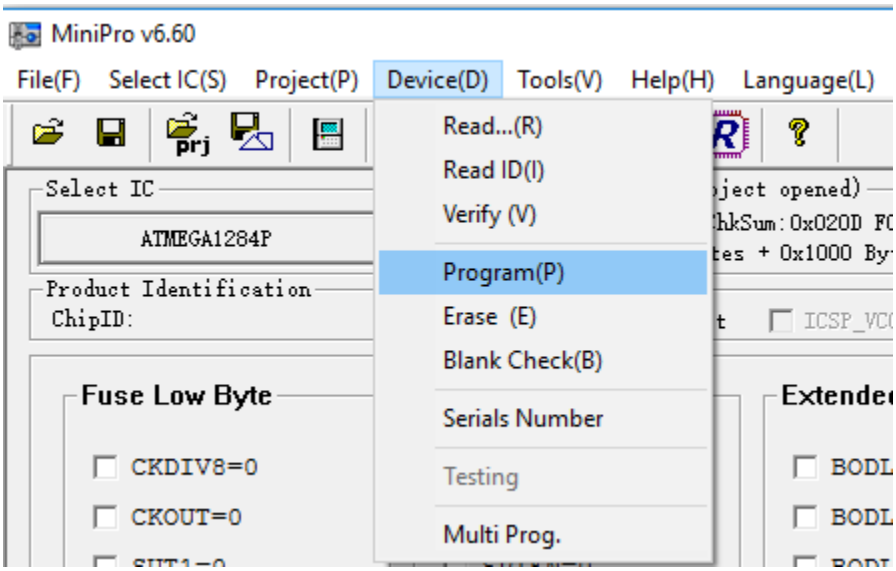
http://atariage.com/forums/index.php?app=core&module=attach&section=attach&attach_id=415771

(MiniPro-programmer-1284p-GAZOO.pdf)

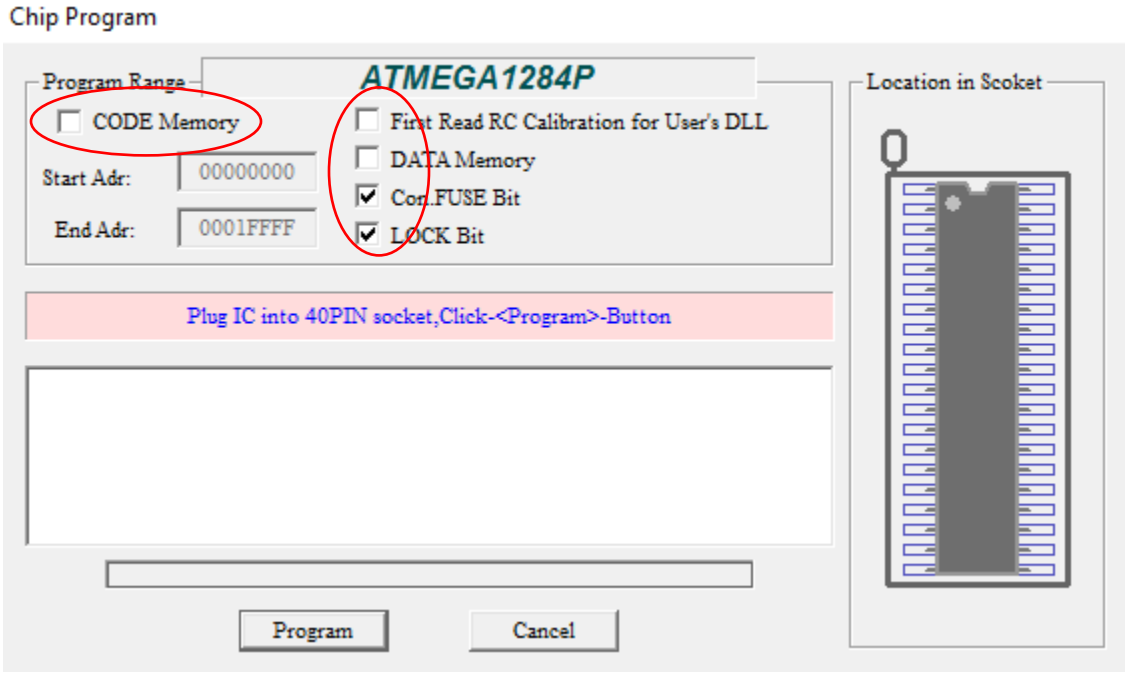
- Search for ATMEGA1248P
- Select Config
- Uncheck the V ticks
- The screen should look like this. Check also all other options
  (as maybe in future versions there could be additional parameters)


MiniPro v6.60
File(F) Select IC(S) Project(P) Device(D) Tools(V) Help(H) Language(L)
Select IC
ATMEGA1284P
IC Information(No Project opened)
ChipType: MCU/MPU ChkSum:0x020D F000
IC Size: 0x20000 Bytes + 0x1000 Bytes
Information
Product Identification
ChipID:
Set Interface
40P adapter ICSP port ICSP_VCC Enable
Buff select
Code Memo Data Memo Config
Fuse Low Byte
CKDIV8=0
CKOUT=0
SUT1=0
SUT0=0
CKSEL3=0
CKSEL2=0
CKSEL1=0
CKSEL0=0
Fuse High Byte
OCDEN=0
JTAGEN=0
SPIEN=0
WDTON=0
EESAVE=0
BOOTSZ1=0
BOOTSZ0=0
BOOTRST=0
Extended Fuse Byte
BODLEVEL2=0
BODLEVEL1=0
BODLEVEL0=0
Lock Bit Byte
BLB12=0
BLB11=0
BLB02=0
BLB01=0
LB2=0
LB1=0
Calibration Programming
Disable Code memory Data Memory
Calib. 00 Memory Address: 0x 00000000
Note: The location value will be replaced by this byte when programming!
Options
Erase befor
Verify after
Skip 0xFF
Blank Check
Check ID
Auto SN_NUM
SetRange: ALL Sect
0x 00000000 -> 0001FFFF
IC Config Informaton
Fuse Low Byte: 0xFF
Fuse high Byte: 0xFF
Extended Fuse Byte: 0xFF
Lock Bit Byte: 0xFF
Calibration Program: Disable
Calibration byte: 0x00
Calibration address: 0x00000000
Read Cali.
Calib. Bytes
Ready
Hardware Interface Ver: TL866A V03.2.80
0000 0000

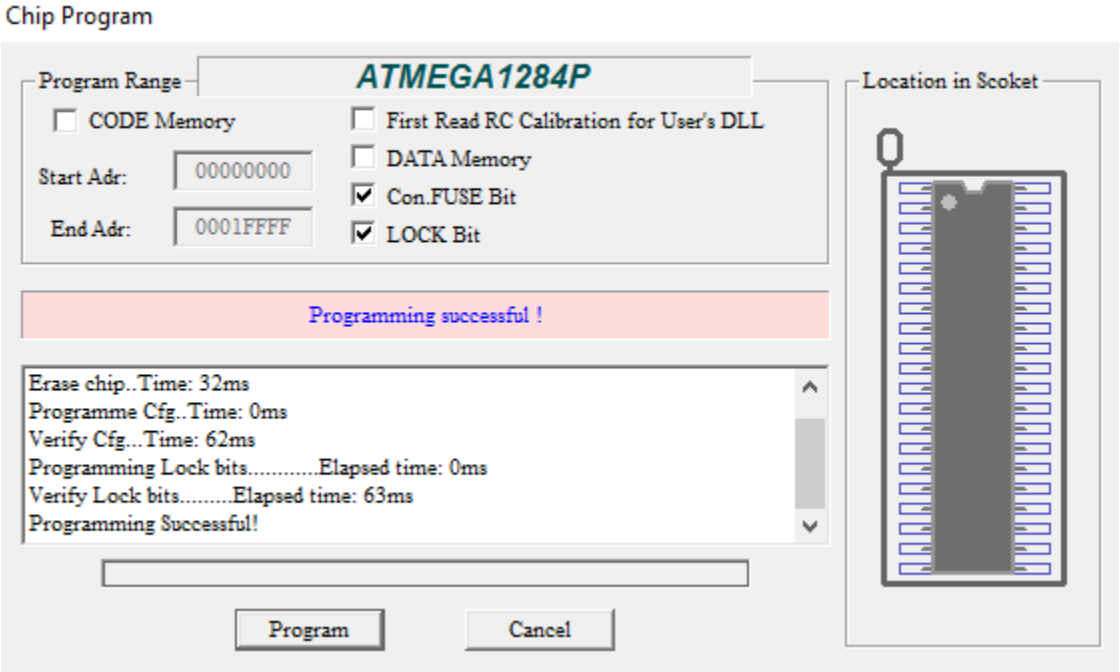
- Click Device > Program



- Uncheck “Code Memory”
- Uncheck First Read RC Calibration for User’s DLL
- Uncheck DATA Memory
- Check Con.FUSE Bit
- Check LOCK Bit



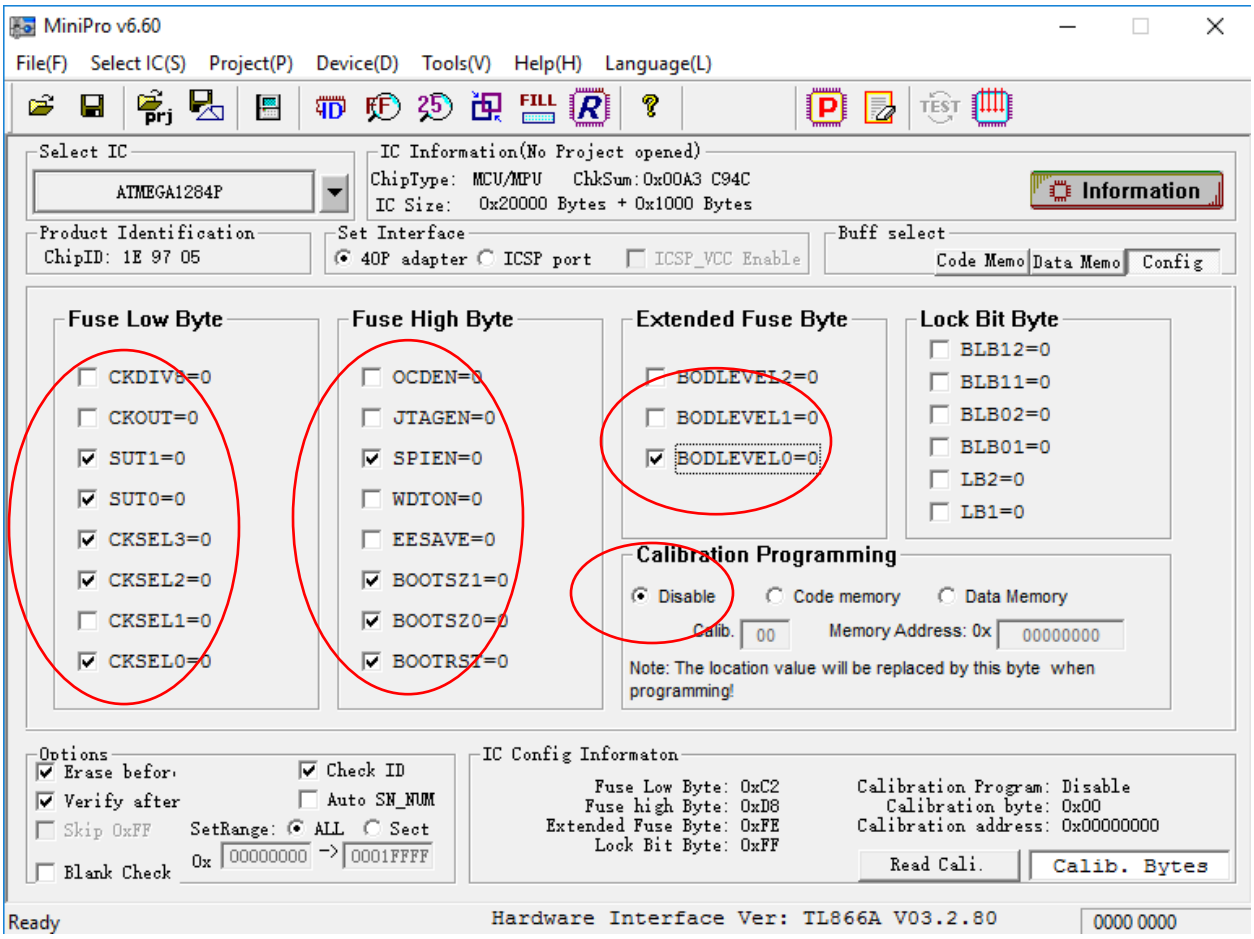
- Then Click Program



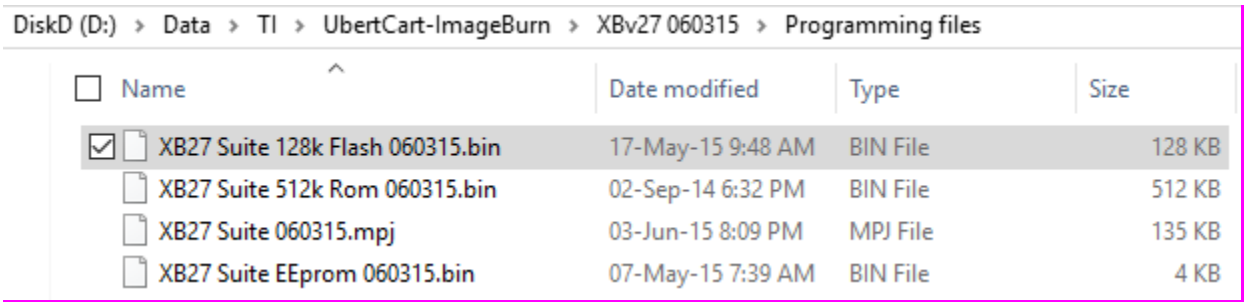
- Press Cancel (to go back to the main screen)
- Select the Config Tab
- Enable the parameters as shown below
- (More explanation about “Fuses” are here: http://atariage.com/forums/topic/244707-preparing-an-avr-as-an-ubergrom/
    - First Column
        - SUT1=0
        - SUT0=0
        - CKSEL3=0
        - CKSEL2=0
        - CKSEL0=0
    - Second Column
        - SPIEN=0
        - BOOTSZ1=0
        - BOOTSZ0=0
        - BOOTRST=0
    - Third Column

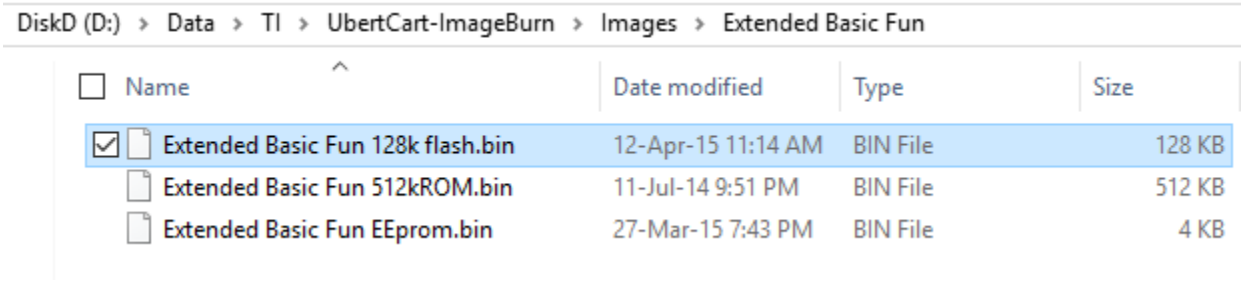
        - BODLEVEL0=0

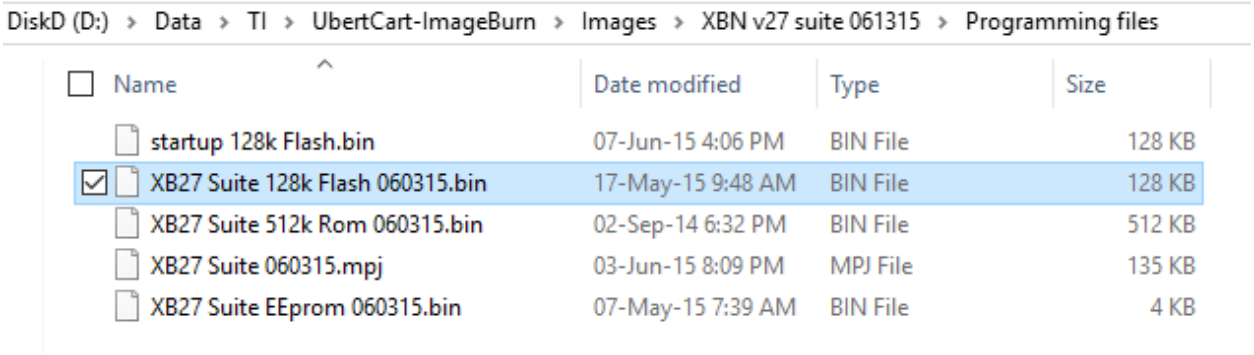
- Click the Code Memory button


MiniPro v6.60
File(F) Select IC(S) Project(P) Device(D) Tools(V) Help(H) Language(L)
Select IC
ATMEGA1284P
IC Information(No Project opened)
ChipType: MCU/MPU ChkSum:0x00A3 C94C
IC Size: 0x20000 Bytes + 0x1000 Bytes
Information
Product Identification
ChipID: 1E 97 05
Set Interface
40P adapter ICSP port ICSP_VCC Enable
Buff select
Code Memo Data Memo Config
Fuse Low Byte
CKDIV8=0
CKOUT=0
SUT1=0
SUT0=0
CKSEL3=0
CKSEL2=0
CKSEL1=0
CKSEL0=0
Fuse High Byte
OCDEN=0
JTAGEN=0
SPIEN=0
WDTON=0
EESAVE=0
BOOTSZ1=0
BOOTSZ0=0
BOOTRST=0
Extended Fuse Byte
BODLEVEL2=0
BODLEVEL1=0
BODLEVEL0=0
Lock Bit Byte
BLB12=0
BLB11=0
BLB02=0
BLB01=0
LB2=0
LB1=0
Calibration Programming
Disable Code memory Data Memory
Calib. 00 Memory Address: 0x 00000000
Note: The location value will be replaced by this byte when programming!
Options
Erase befor
Verify after
Skip 0xFF
Blank Check
Check ID
Auto SN_NUM
SetRange: ALL Sect
0x 00000000 -> 0001FFFF
IC Config Informaton
Fuse Low Byte: 0xC2
Fuse high Byte: 0xD8
Extended Fuse Byte: 0xFE
Lock Bit Byte: 0xFF
Calibration Program: Disable
Calibration byte: 0x00
Calibration address: 0x00000000
Read Cali.
Calib. Bytes
Ready
Hardware Interface Ver: TL866A V03.2.80
0000 0000

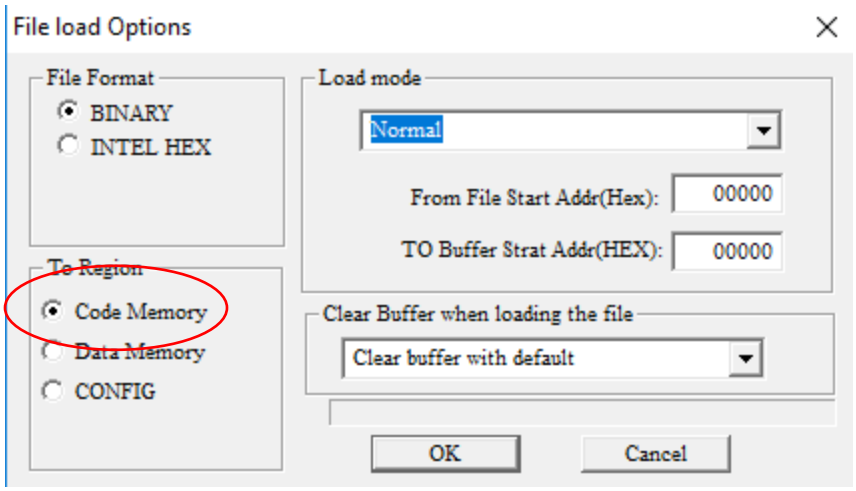
- Click the file tab and open to load the 128k flash file (must be a .bin file).
- I used the 128K.bin file from the ExBas 2.7 Suite ("**XBv27 060315.zip**")
- Source:
  http://atariage.com/forums/topic/229718-extended-basic-v27-suite-cartridge/page-21
  Direct link to .zip file:
  http://atariage.com/forums/index.php?app=core&module=attach&section=attach&attach_rel_module=post&attach_id=394788
- Extract the .zip file: **XBv27 060315.zip**
  and go to the subdirectory to find **"XB27 Suite 128k Flash 060315.bin"**



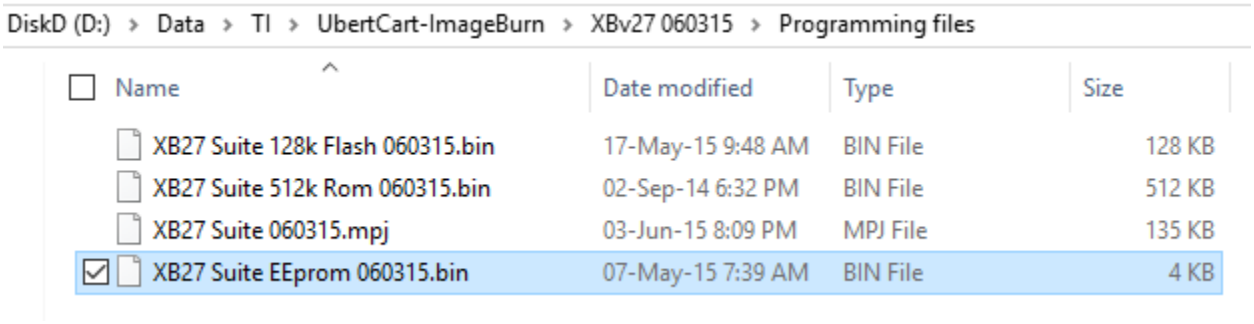


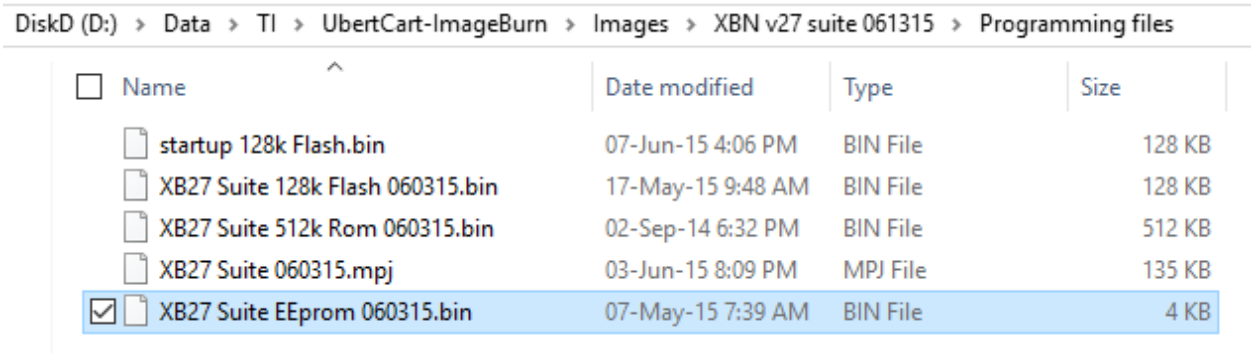


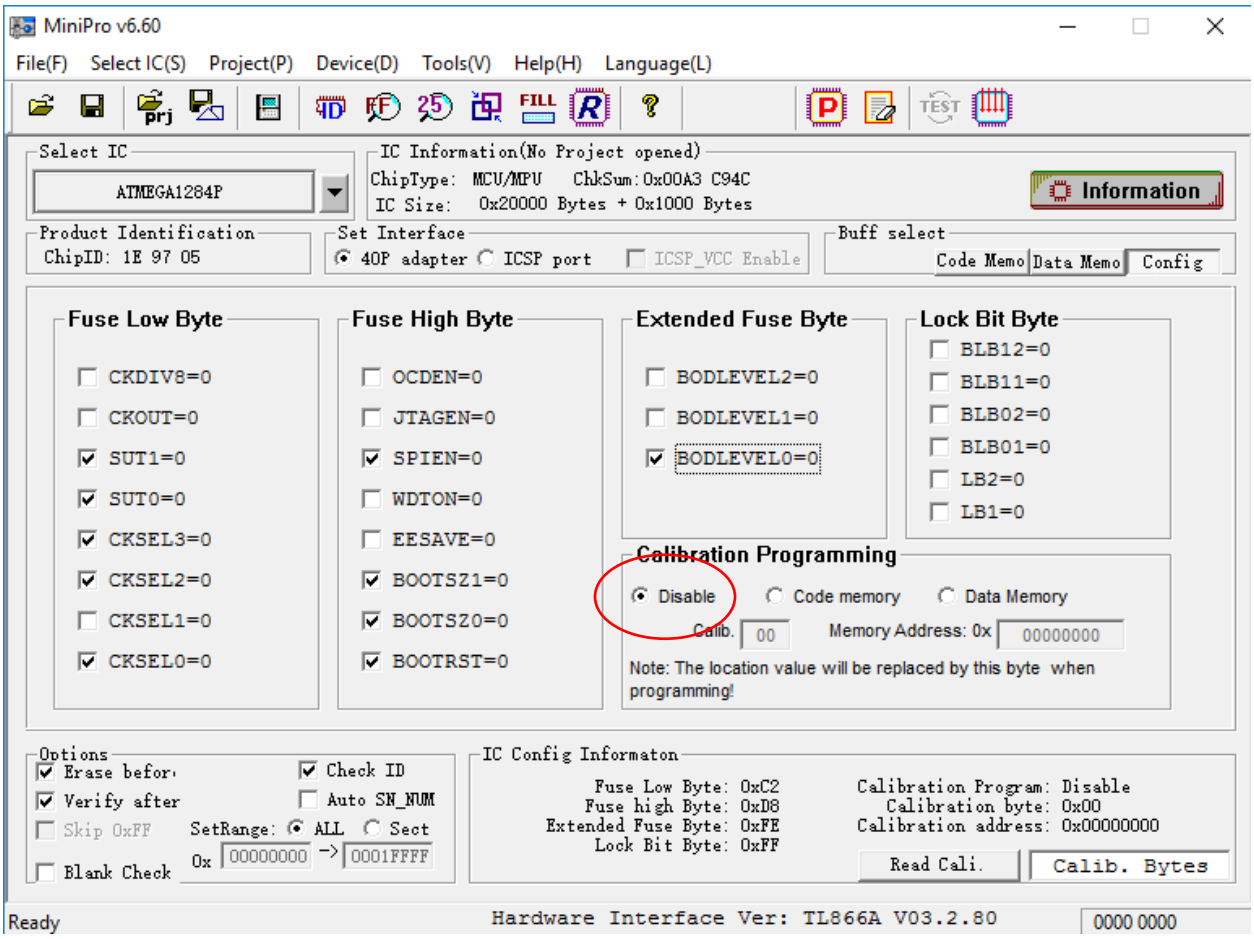
- File > Open "XB27 Suite 128k Flash 060315.bin"


File load Options
File Format
BINARY
INTEL HEX
Load mode
Normal
From File Start Addr(Hex):
00000
TO Buffer Strat Addr(HEX):
00000
To Region
Code Memory
Data Memory
CONFIG
Clear Buffer when loading the file
Clear buffer with default
OK
Cancel

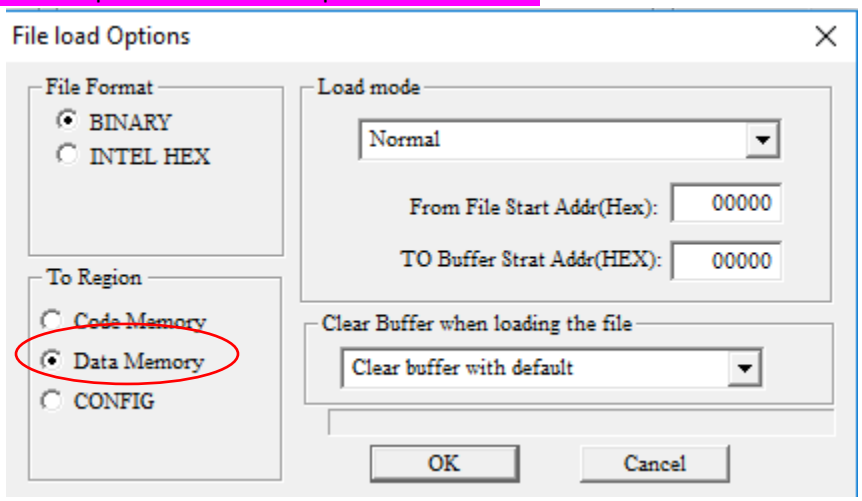
- Click the data memo tab and then click the file tab and open to load the EEprom file (must be a .bin file).



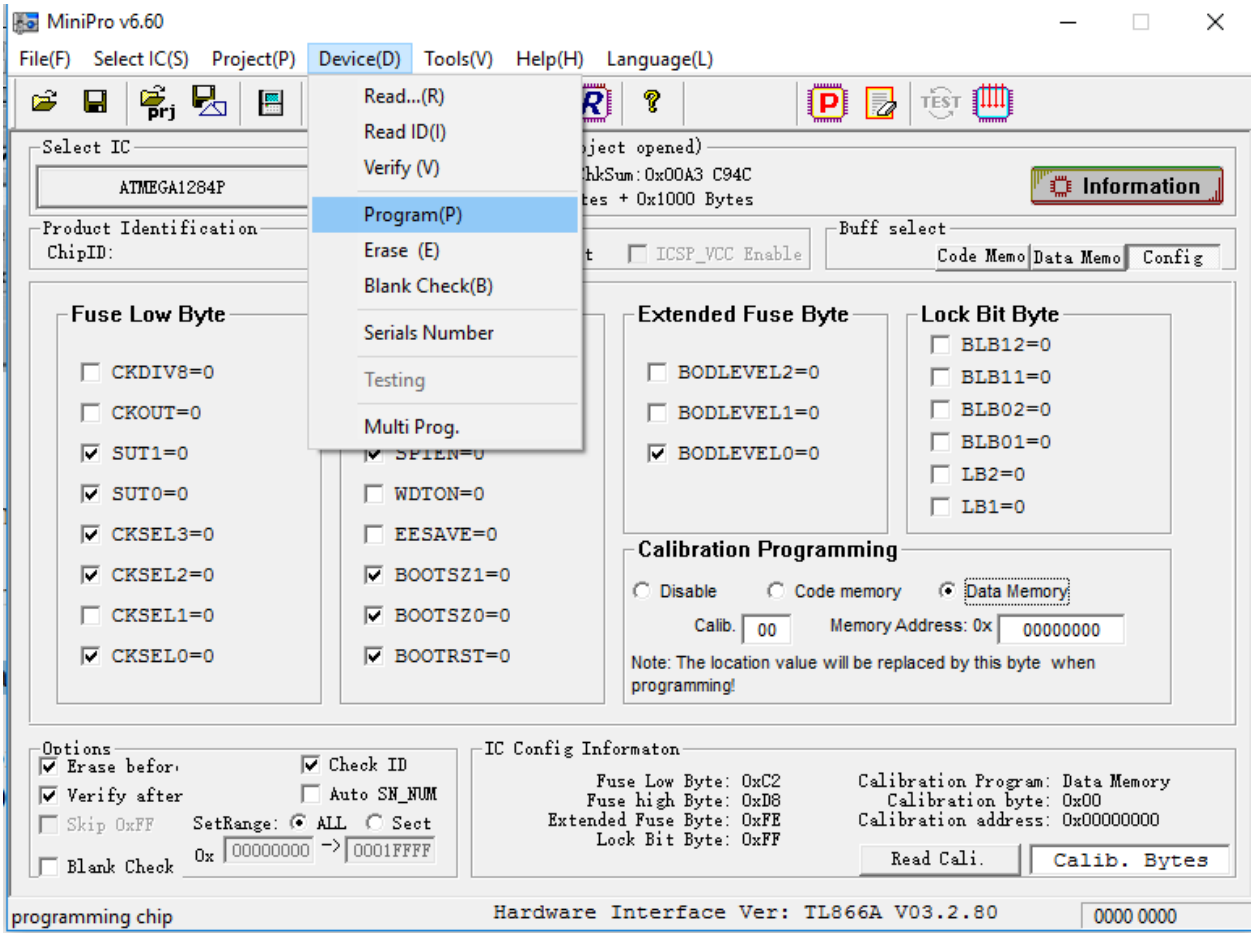



MiniPro v6.60
File(F) Select IC(S) Project(P) Device(D) Tools(V) Help(H) Language(L)
Select IC
ATMEGA1284P
IC Information(No Project opened)
ChipType: MCU/MPU ChkSum:0x00A3 C94C
IC Size: 0x20000 Bytes + 0x1000 Bytes
Information
Product Identification
ChipID: 1E 97 05
Set Interface
40P adapter ICSP port ICSP_VCC Enable
Buff select
Code Memo Data Memo Config
Fuse Low Byte
CKDIV8=0
CKOUT=0
SUT1=0
SUT0=0
CKSEL3=0
CKSEL2=0
CKSEL1=0
CKSEL0=0
Fuse High Byte
OCDEN=0
JTAGEN=0
SPIEN=0
WDTON=0
EESAVE=0
BOOTSZ1=0
BOOTSZ0=0
BOOTRST=0
Extended Fuse Byte
BODLEVEL2=0
BODLEVEL1=0
BODLEVEL0=0
Lock Bit Byte
BLB12=0
BLB11=0
BLB02=0
BLB01=0
LB2=0
LB1=0
Calibration Programming
Disable Code memory Data Memory
Calib. 00 Memory Address: 0x 00000000
Note: The location value will be replaced by this byte when programming!
Options
Erase befor
Verify after
Skip 0xFF
Blank Check
Check ID
Auto SN_NUM
SetRange: ALL Sect
0x 00000000 -> 0001FFFF
IC Config Informaton
Fuse Low Byte: 0xC2
Fuse high Byte: 0xD8
Extended Fuse Byte: 0xFE
Lock Bit Byte: 0xFF
Calibration Program: Disable
Calibration byte: 0x00
Calibration address: 0x00000000
Read Cali.
Calib. Bytes
Ready
Hardware Interface Ver: TL866A V03.2.80
0000 0000

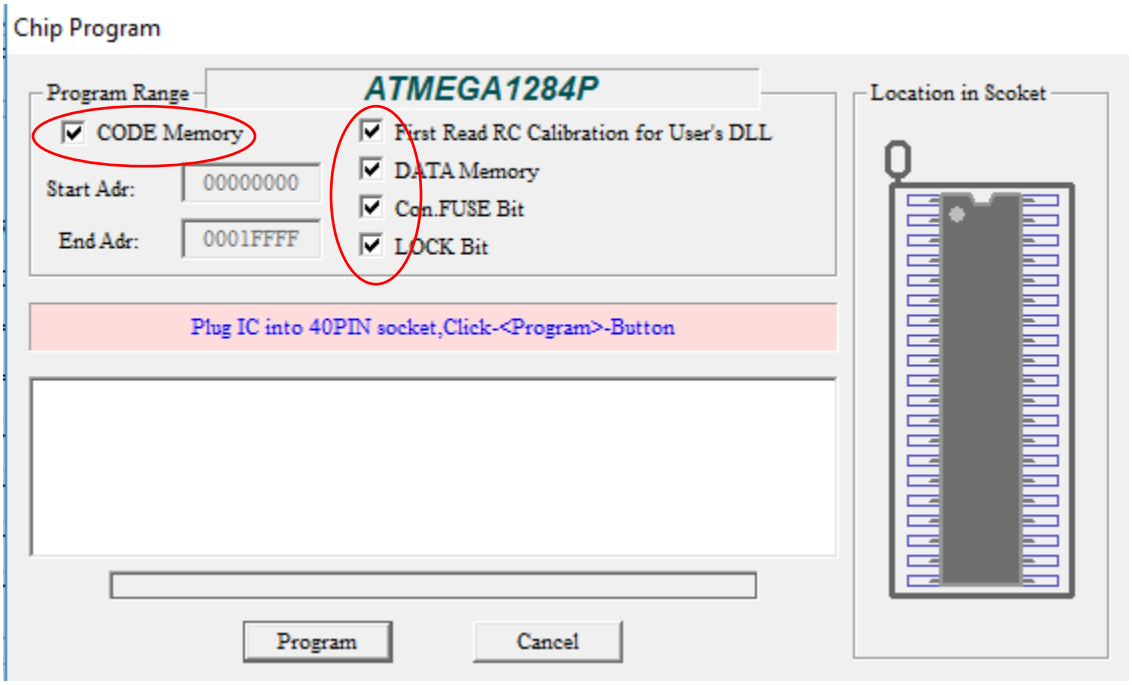
- File > Open “XB27 Suite EEprom 060315.bin”



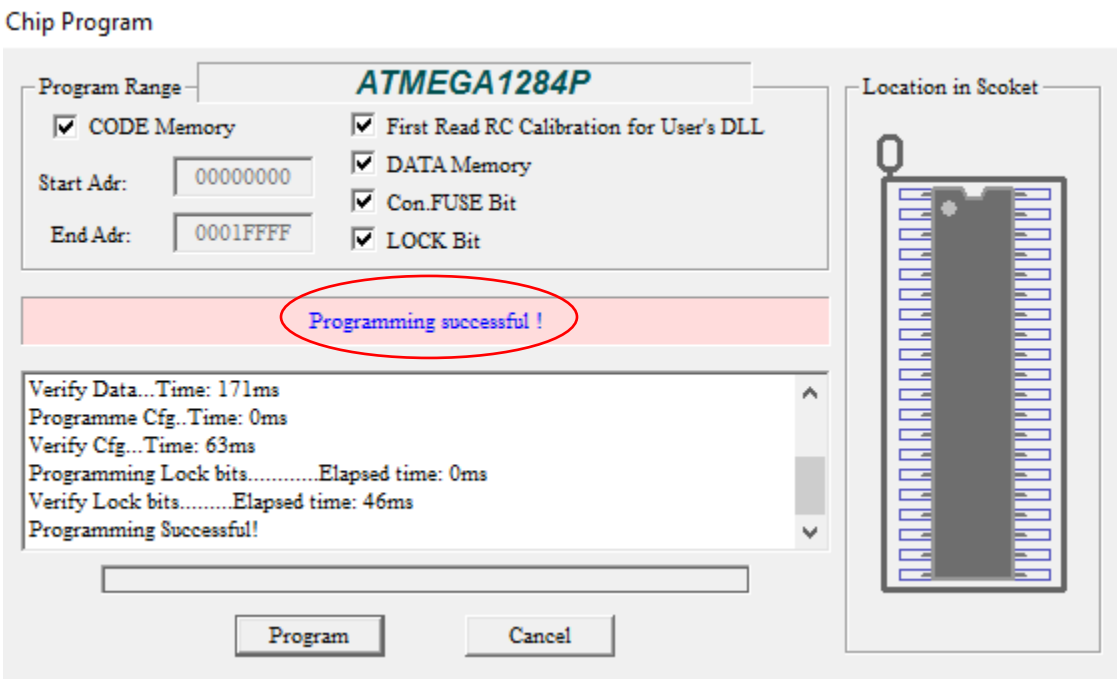
- Click “Device > Program



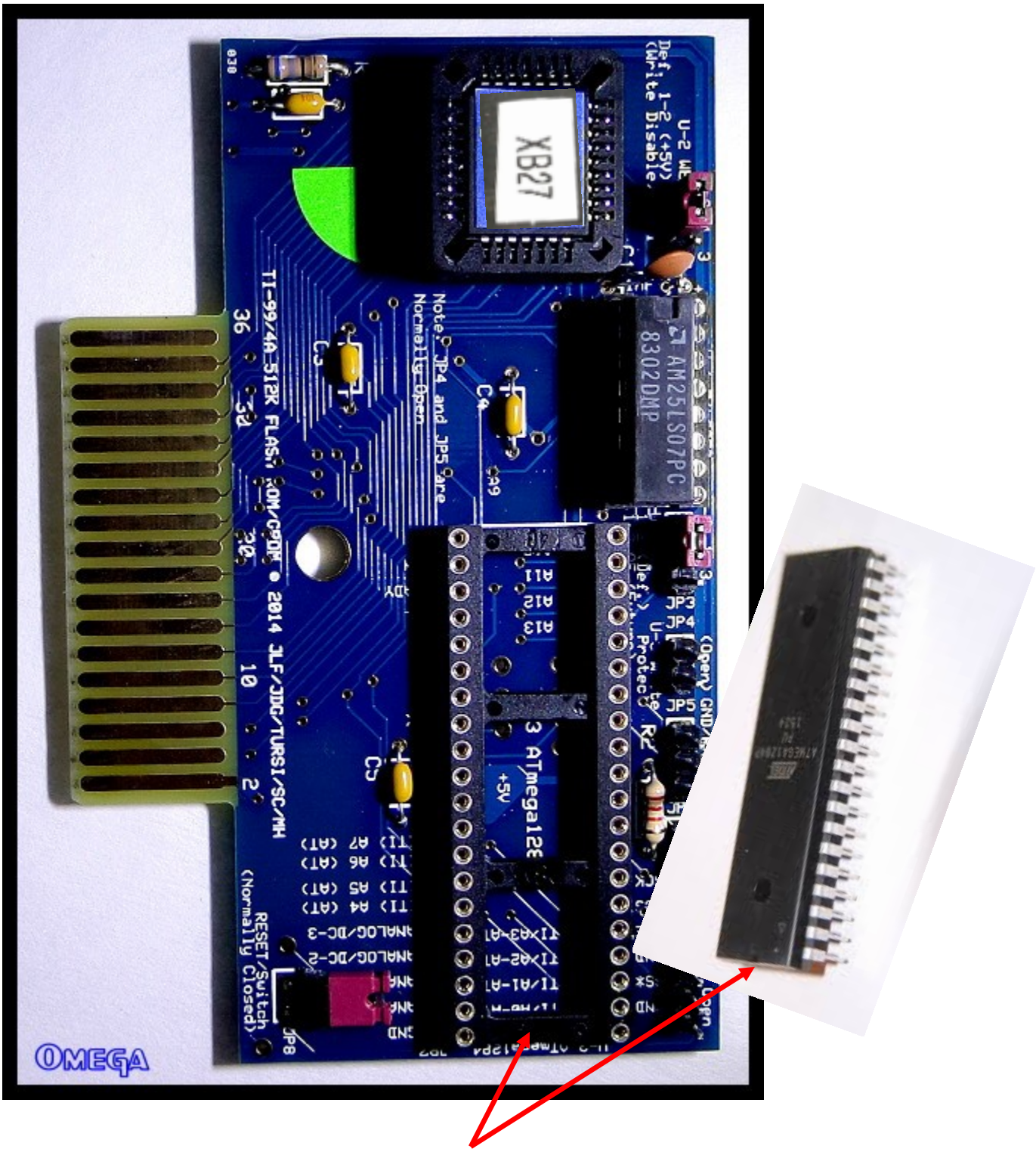
- Select all the Parameters



- Click Program and wait until "Programming Successful"
(note that Gazoo's document mentioned: *You will get an error* when it programs the fuses (the last part), but it will have successfully programmed them). But with this version 6.60 software and TL866A version everything is okay.



- Click Cancel
- Close the program
- And remove the ATMEGA1248P from the MiniPro
- Insert the ATMEGA1248P into the UberGrom Cart



More information about the ATMEGA1248P AVR

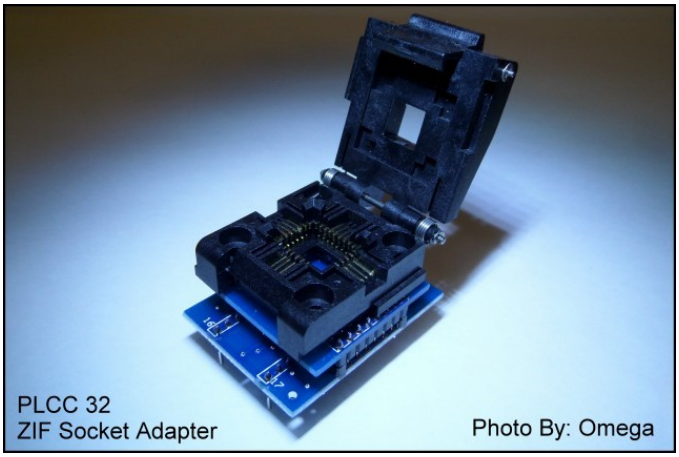
http://atariage.com/forums/topic/249396-ubergrom-mini-avr/page-1#entry3446429

Part 2 – Programming the AT49F040 Chip using the MiniPro and PLCC32 ZIF (Zero Insertion Force) Socket Adapter

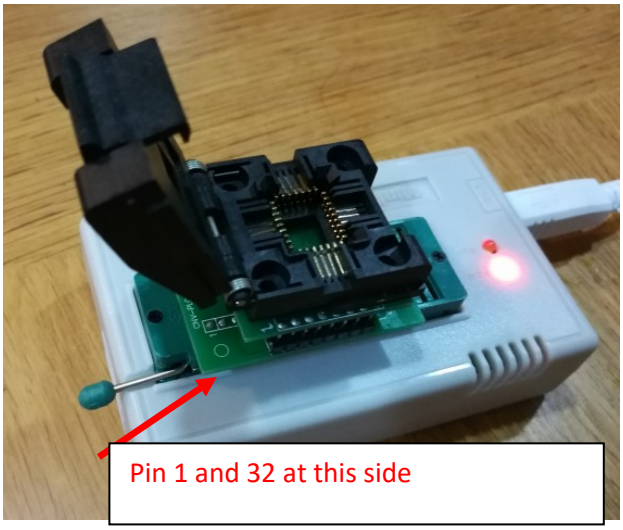
I am using the "AT49F040-90JC" AT49F040 version (without T)
http://pdf.datasheetcatalog.com/datasheets/270/132294_DS.pdf

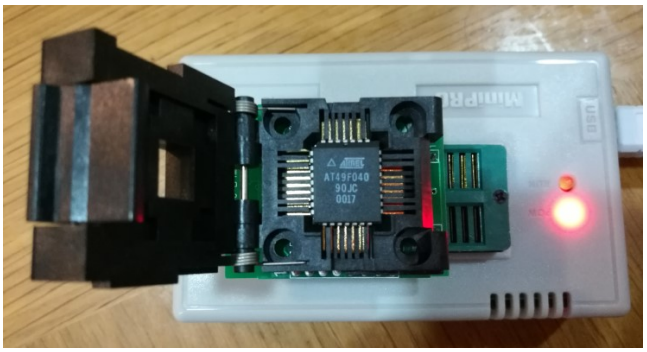


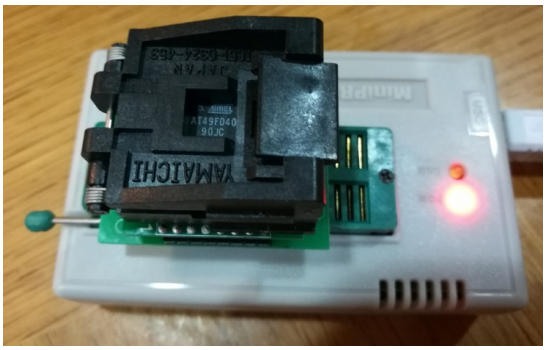
4-Megabit, (512K x 8) 5-volt Only CMOS Flash Memory AT49F040, AT49F040T, AT49F040/040T



- Insert the PLCC 32 ZIF adapter with PIN 1 and PIN 32 (and the hole indicator) at the correct position in the MiniPro



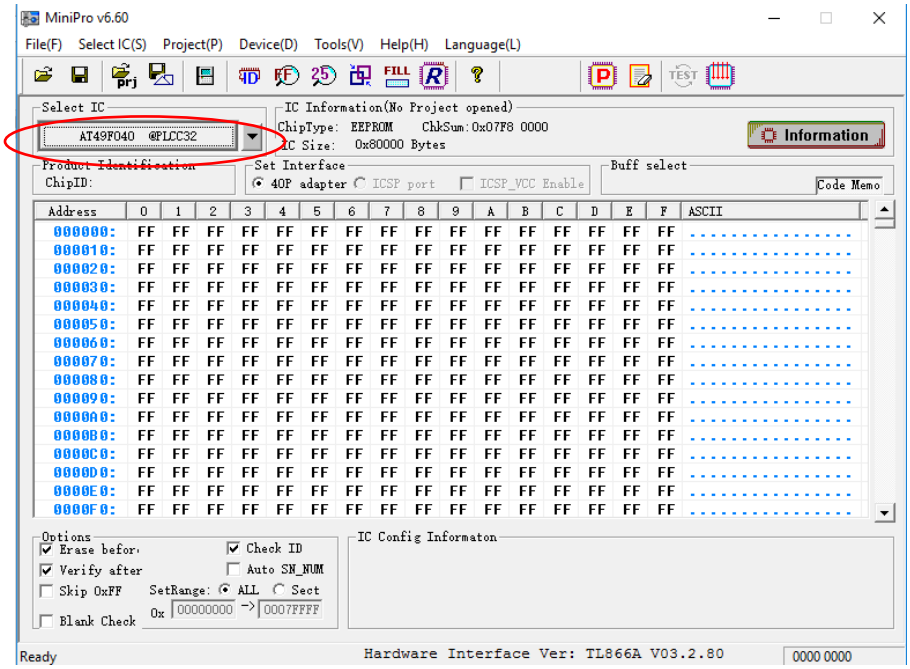


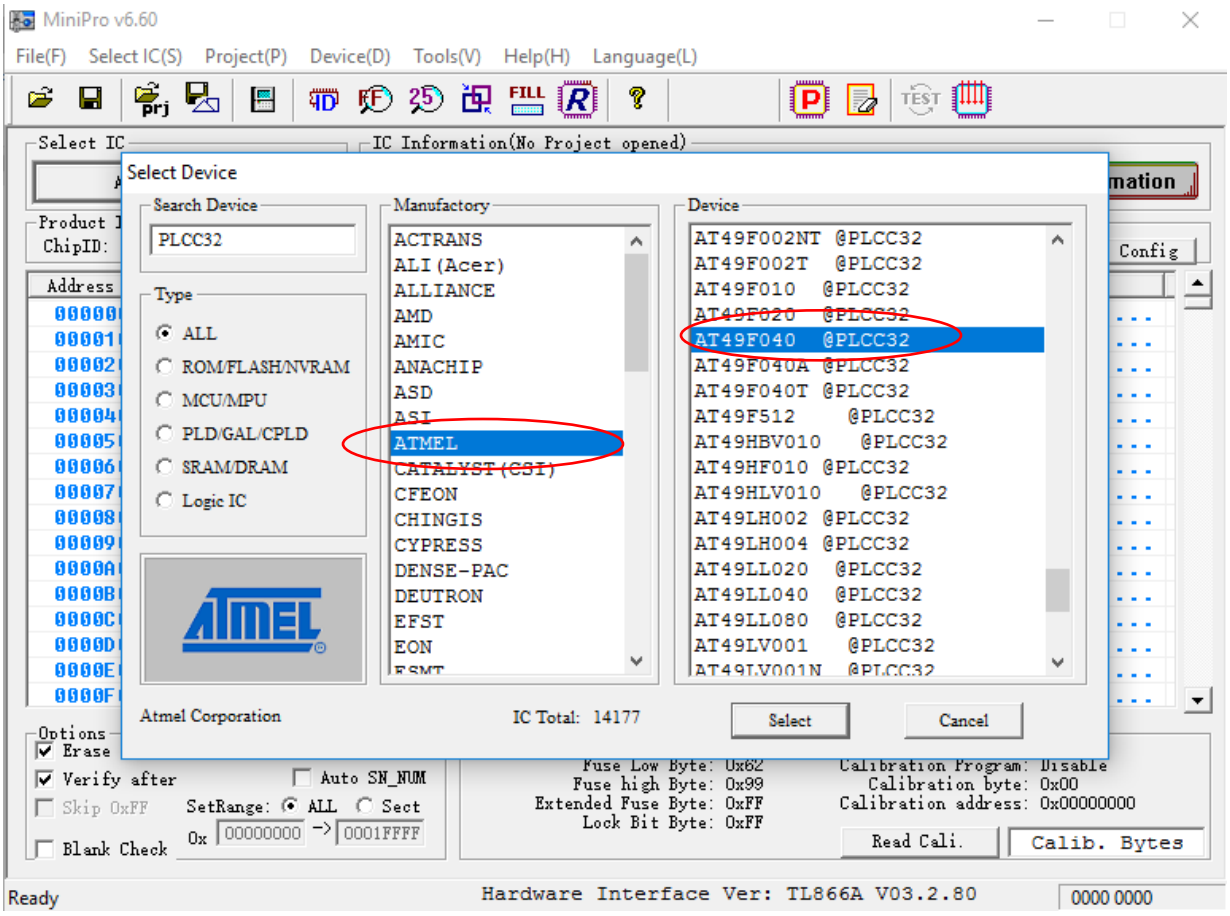


- Insert the AT49F040 into the PLCC32 and lock/secure it properly

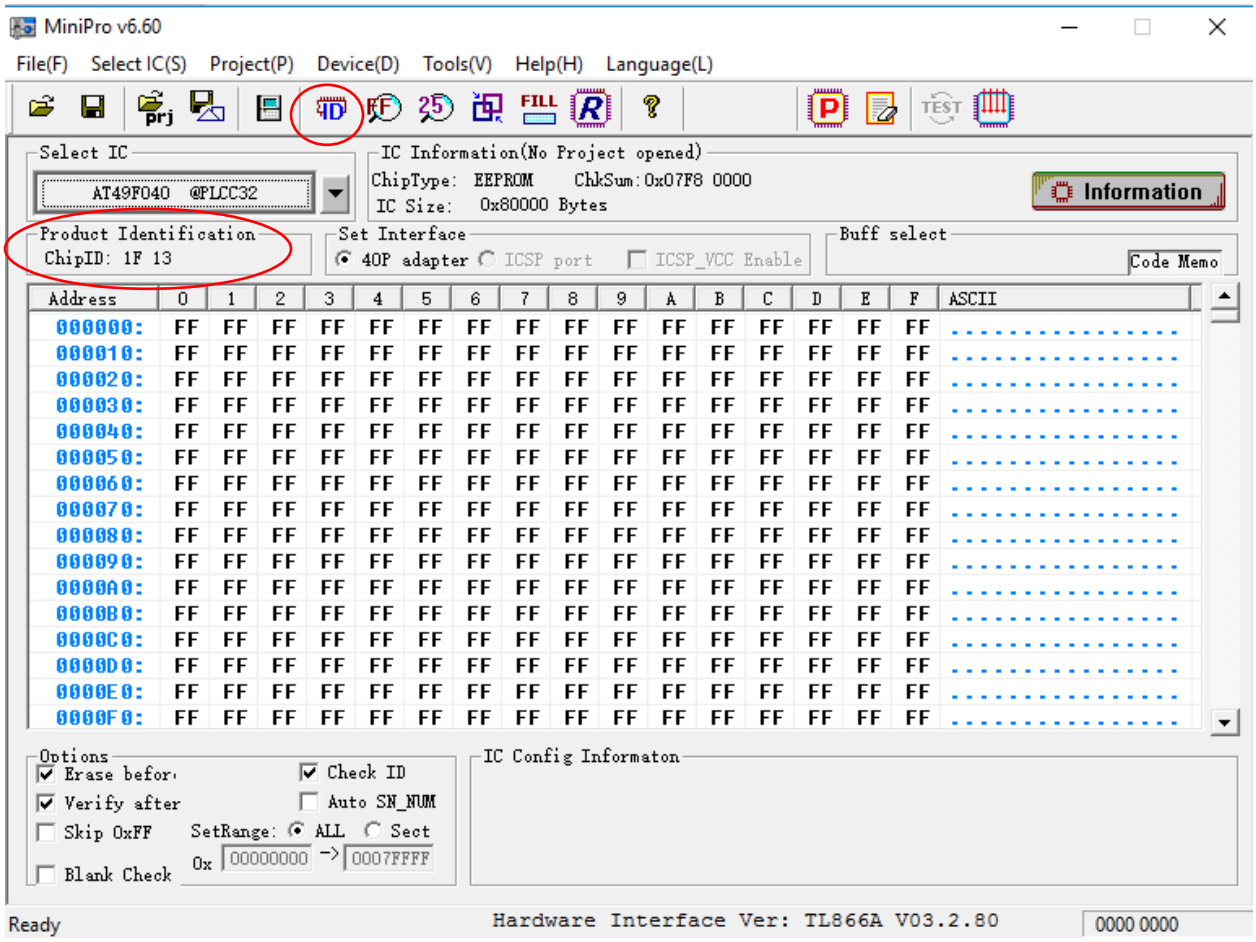
- (Background information http://atariage.com/forums/index.php?app=core&module=attach&section=attach&attach_id=483532)

- Select the right chip and socket
  In my case **ATMEL - AT49F040 and @PLCC32**





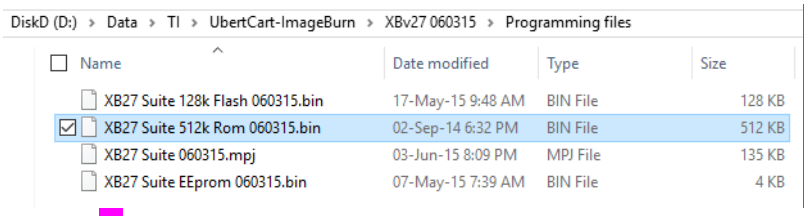
- Press the ID Icon
  (it will show the ChipID information, in my case 1F 13)



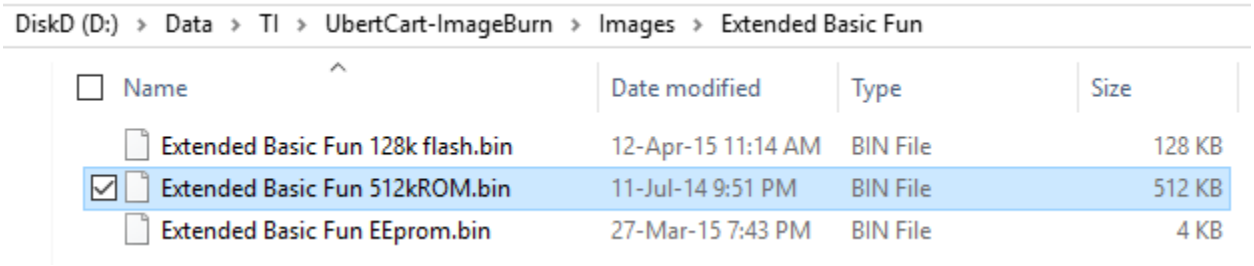
- File open
- Select the "512K Rom file" (we used the one from the ExBas Suite, see Part 1)

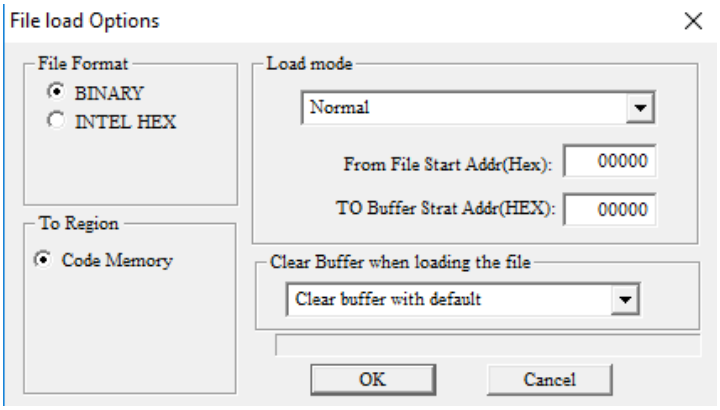
- Extended Basic Fun (Exbas 2.7 + XB256 + TML)
  http://atariage.com/forums/index.php?app=core&module=attach&section=attach&attach_id=387341 "**Extended Basic Fun.zip**"
- http://atariage.com/forums/topic/223979-setting-up-a-632k-cart/page-6#entry3217247

Note: Here are many more images
  - http://atariage.com/forums/blog/567/entry-12468-bin-repository-backup-extra-stuff-updated-030916/
  - http://atariage.com/forums/topic/243766-bin-repository-images-for-burning-cartridges-5142017/page-2#entry3347254

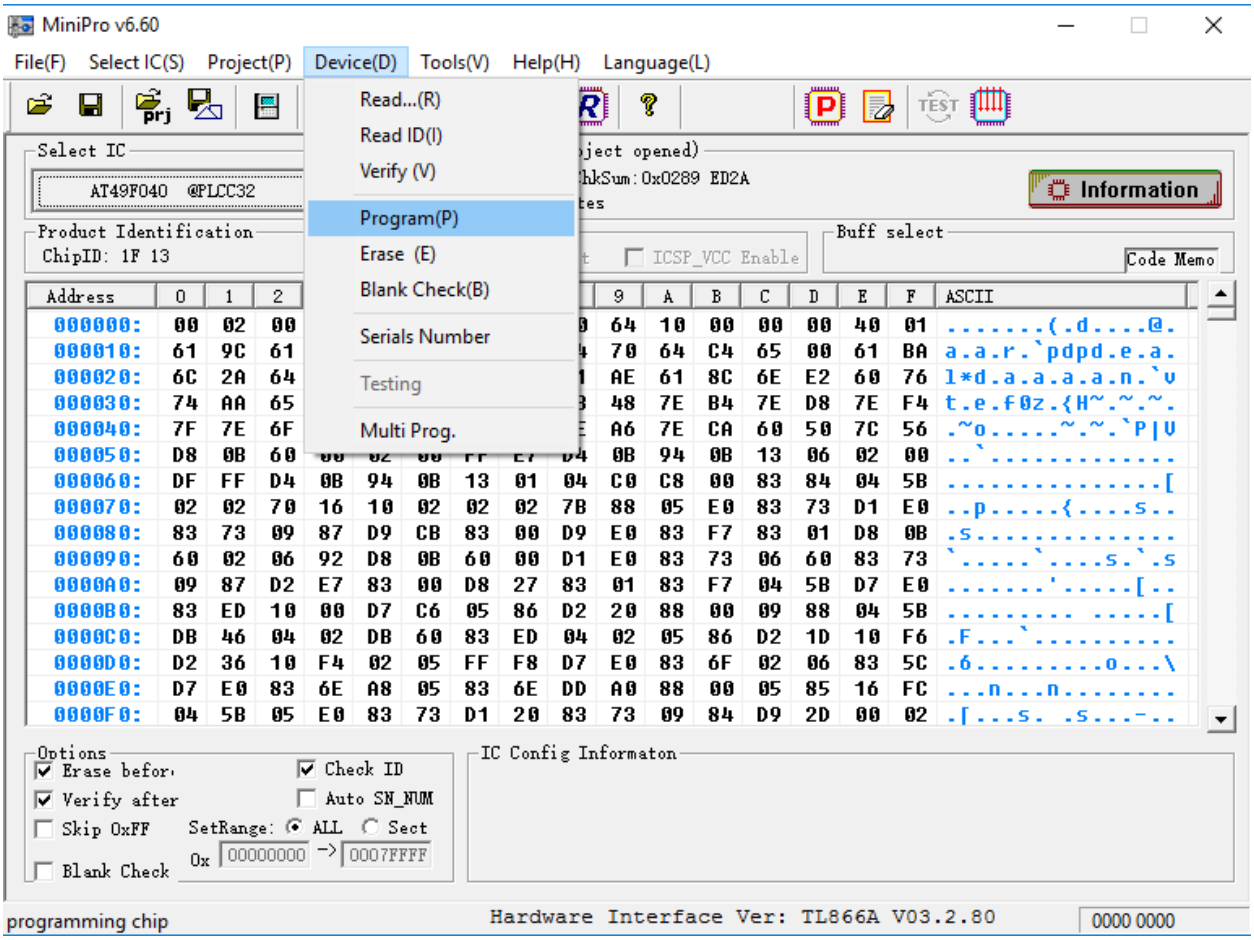


- A new window will pop-up

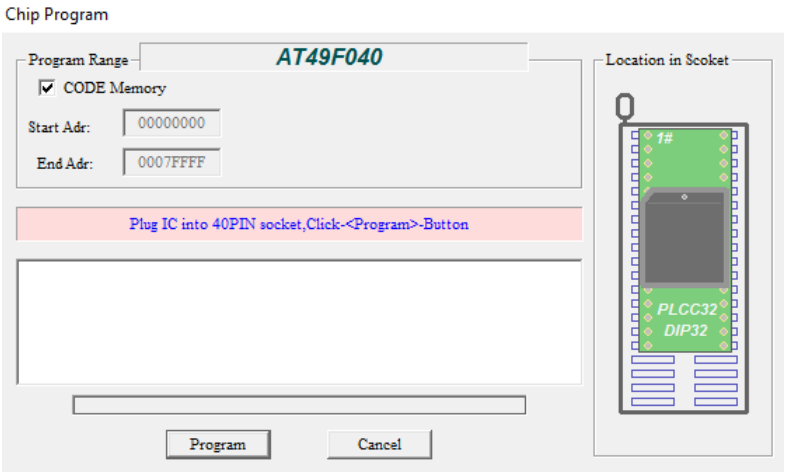


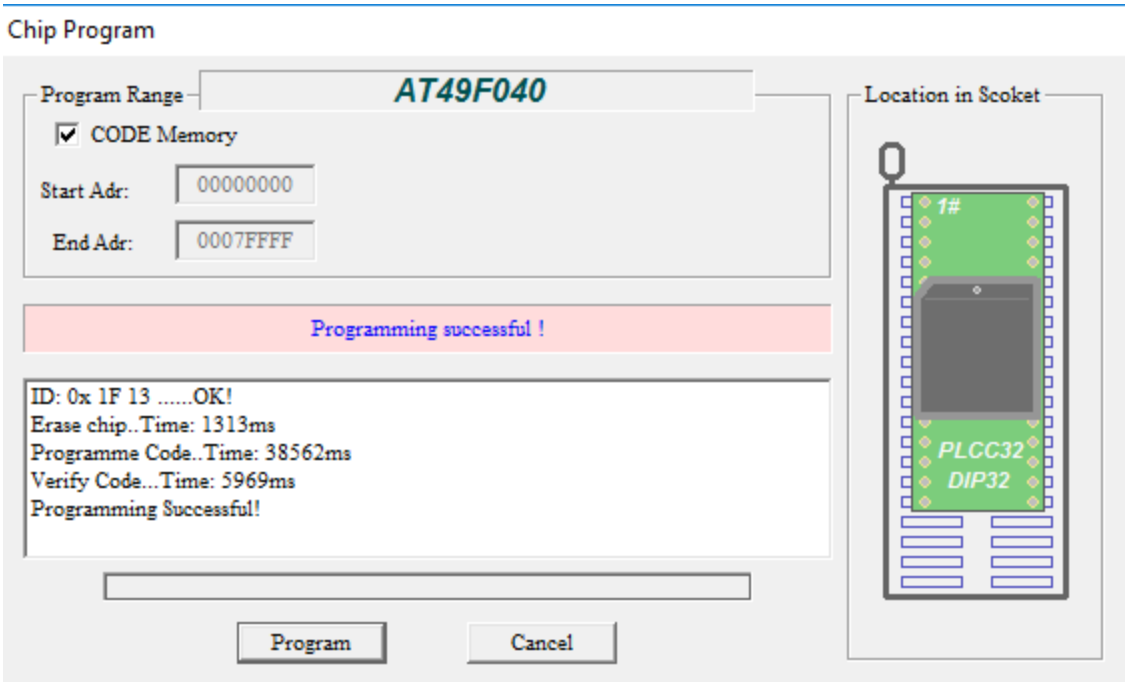


Device > Program

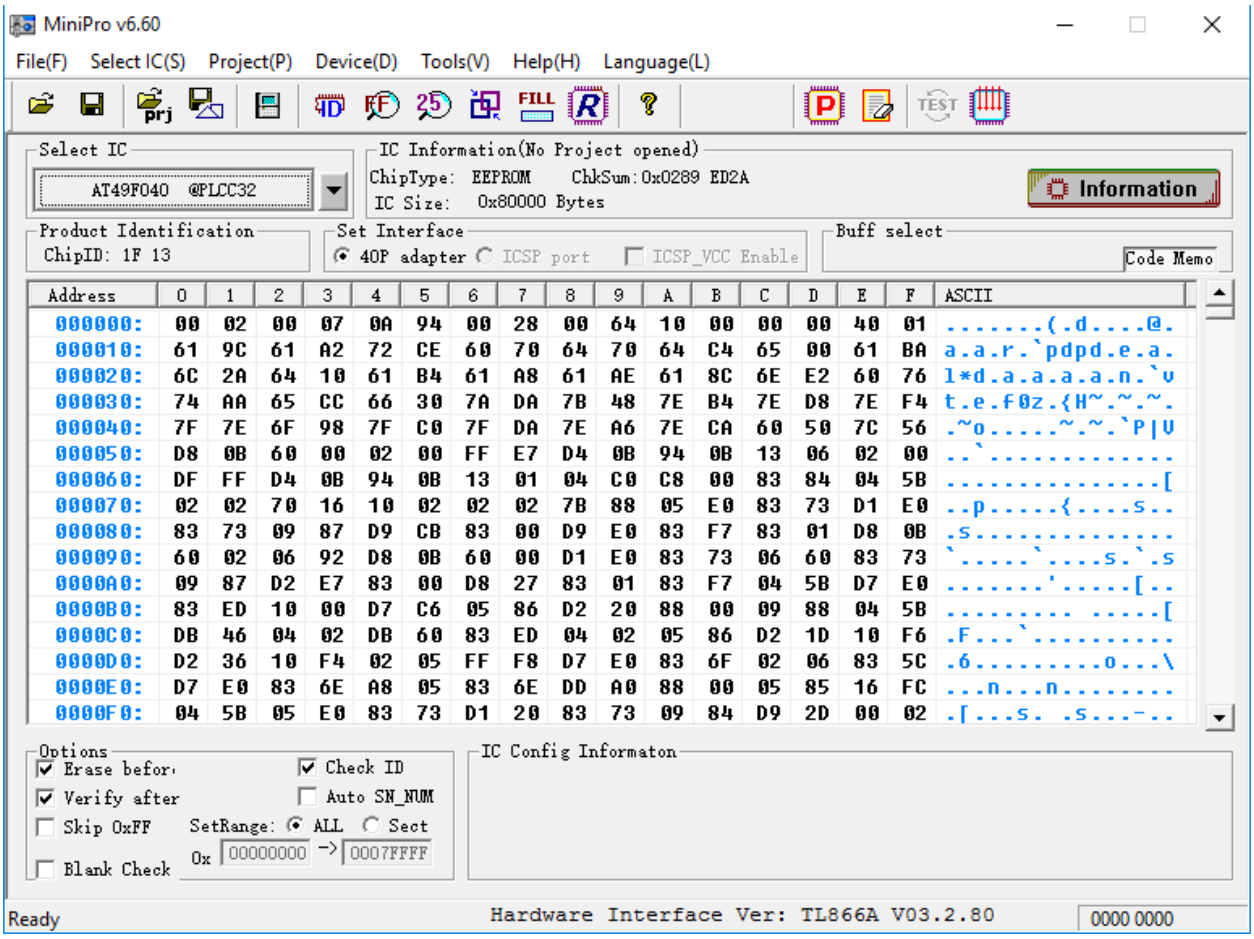


- Click Program




Chip Program
Program Range
AT49F040
CODE Memory
Start Adr:
00000000
End Adr:
0007FFFF
Location in Scoket
1#
PLCC32
DIP32
Programming successful !
ID: 0x 1F 13 .....OK!
Erase chip..Time: 1313ms
Programme Code..Time: 38562ms
Verify Code...Time: 5969ms
Programming Successful!
Program
Cancel

- Cancel


MiniPro v6.60
File(F) Select IC(S) Project(P) Device(D) Tools(V) Help(H) Language(L)
Select IC
AT49F040 @PLCC32
IC Information(No Project opened)
ChipType: EEPROM ChkSum:0x0289 ED2A
IC Size: 0x80000 Bytes
Information
Product Identification
ChipID: 1F 13
Set Interface
40P adapter ICSP port ICSP_VCC Enable
Buff select
Code Memo
Address 0 1 2 3 4 5 6 7 8 9 A B C D E F ASCII
000000: 00 02 00 07 0A 94 00 28 00 64 10 00 00 00 40 01 .....(.d....@.
000010: 61 9C 61 A2 72 CE 60 70 64 70 64 C4 65 00 61 BA a.a.r.`pdpd.e.a.
000020: 6C 2A 64 10 61 B4 61 A8 61 AE 61 8C 6E E2 60 76 l*d.a.a.a.n.`v
000030: 74 AA 65 CC 66 30 7A DA 7B 48 7E B4 7E D8 7E F4 t.e.f0z.{H~.~.~.
000040: 7F 7E 6F 98 7F C0 7F DA 7E A6 7E CA 60 50 7C 56 .~o.....~.~.`P|V
000050: D8 0B 60 00 02 00 FF E7 D4 0B 94 0B 13 06 02 00 ..`.............
000060: DF FF D4 0B 94 0B 13 01 04 C0 C8 00 83 84 04 5B ....[
000070: 02 02 70 16 10 02 02 02 7B 88 05 E0 83 73 D1 E0 ..p.....{....s..
000080: 83 73 09 87 D9 CB 83 00 D9 E0 83 F7 83 01 D8 0B .s..............
000090: 60 02 06 92 D8 0B 60 00 D1 E0 83 73 06 60 83 73 `.....`....s.`.s
0000A0: 09 87 D2 E7 83 00 D8 27 83 01 83 F7 04 5B D7 E0 ....'.....[..
0000B0: 83 ED 10 00 D7 C6 05 86 D2 20 88 00 09 88 04 5B ....[
0000C0: DB 46 04 02 DB 60 83 ED 04 02 05 86 D2 1D 10 F6 .F...`..........
0000D0: D2 36 10 F4 02 05 FF F8 D7 E0 83 6F 02 06 83 5C .6.........o...\
0000E0: D7 E0 83 6E A8 05 83 6E DD A0 88 00 05 85 16 FC ...n...n........
0000F0: 04 5B 05 E0 83 73 D1 20 83 73 09 84 D9 2D 00 02 .[...s. .s...-..
Options
Erase befor
Verify after
Skip 0xFF
Blank Check
Check ID
Auto SN_NUM
SetRange: ALL Sect
0x 00000000 -> 0007FFFF
IC Config Informaton
Ready
Hardware Interface Ver: TL866A V03.2.80
0000 0000

- Quit the program
- Open the PLCC32 holder and Remove the **AT49F04** Chip
- Insert the **AT49F04 Chip**into the UberGrom Cart

Extended Basic 2.7 Suite with Speech Synthesizer saying “Texas Instruments Home Computer” at the startup screen

(the latest version I “XBN v27 suite 061315.zip”
http://atariage.com/forums/index.php?app=core&module=attach&section=attach&attach_id=396166
and the latest (to use via disk upgrade / Grom Loader is

- **XB27SPEECH.dsk** **180KB** http://atariage.com/forums/index.php?app=core&module=attach&section=attach&attach_id=398747
- **060715XB27.dsk** http://atariage.com/forums/index.php?app=core&module=attach&section=attach&attach_id=398748

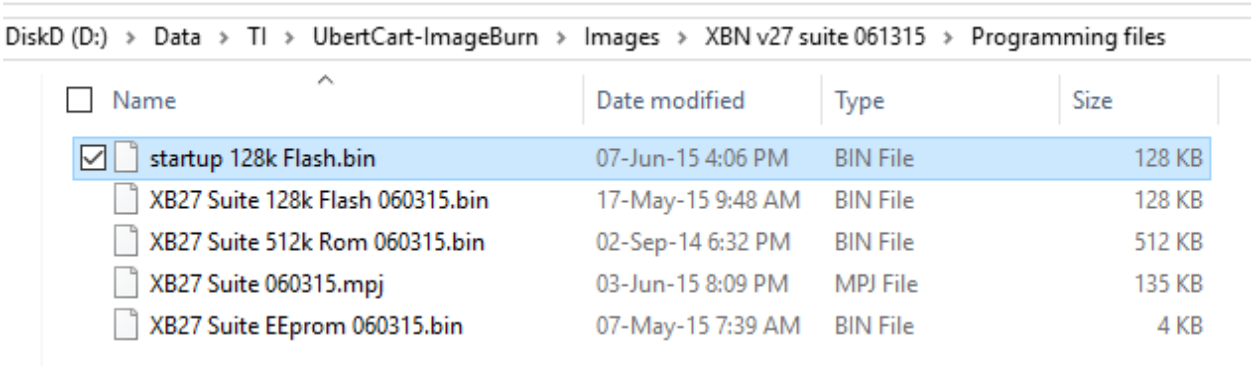


Upgrading the Extended Basic Suite 2.7

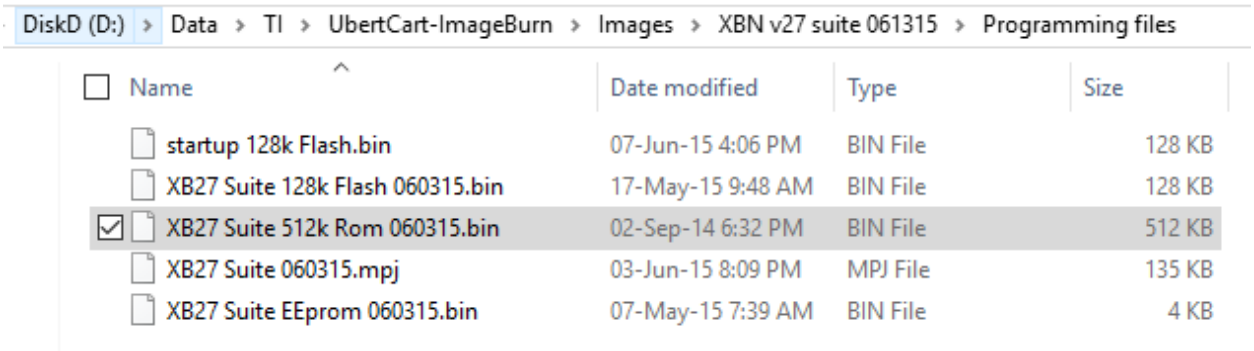
- http://atariage.com/forums/topic/237401-xb27s-cartridge-boot-return-interception-utility/?p=3225086

- http://atariage.com/forums/topic/229718-extended-basic-v27-suite-cartridge/page-10#entry3206707
- http://atariage.com/forums/blog/567/entry-11327-extended-basic-v27-suite-final-update-9272015/?st=20#commentsStart
- http://atariage.com/forums/blog/567/entry-12468-bin-repository-backup-extra-stuff-updated-030916/

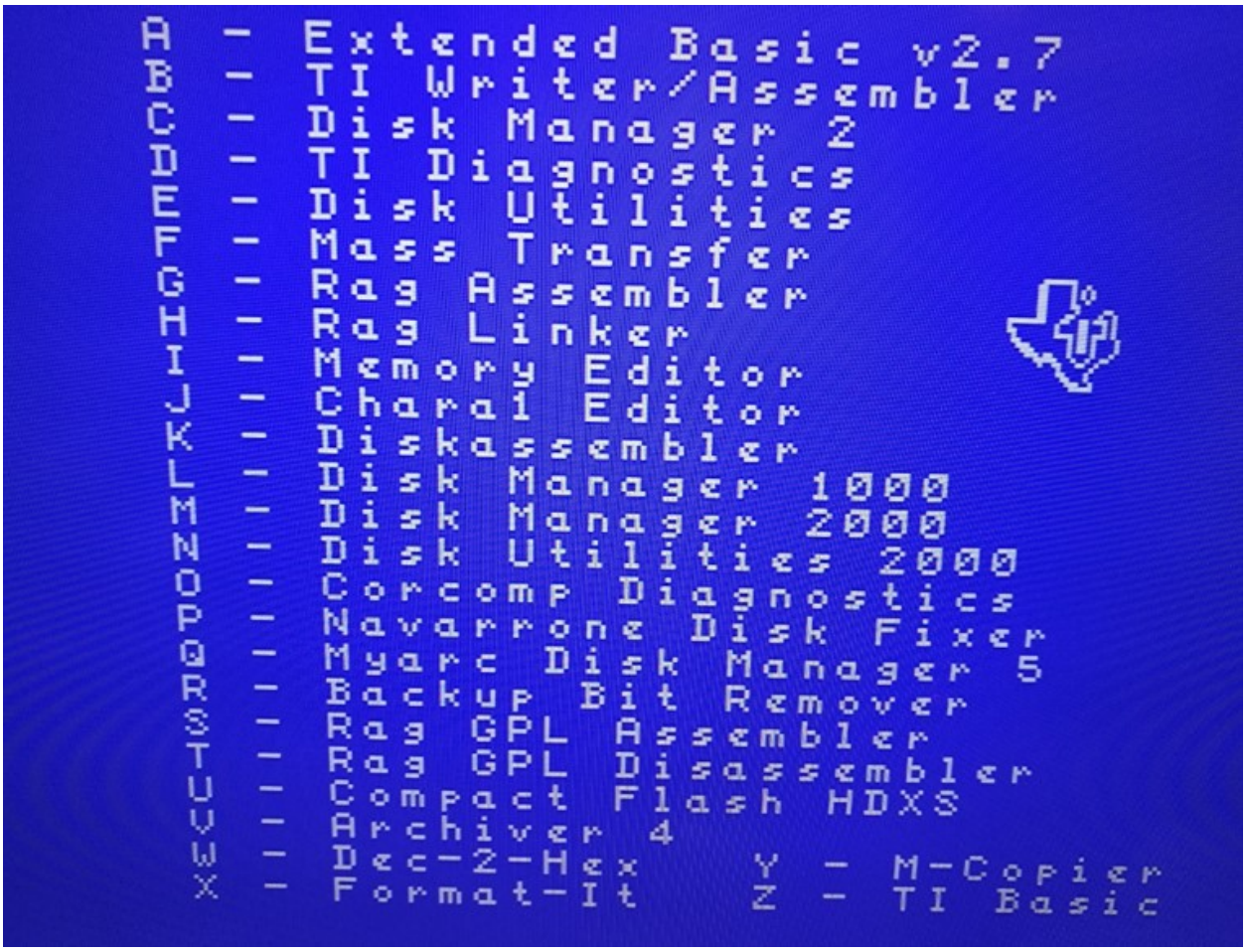
- ATMEGA1248P
  - For Code Memory startup 128k Flash.bin
  -



- For

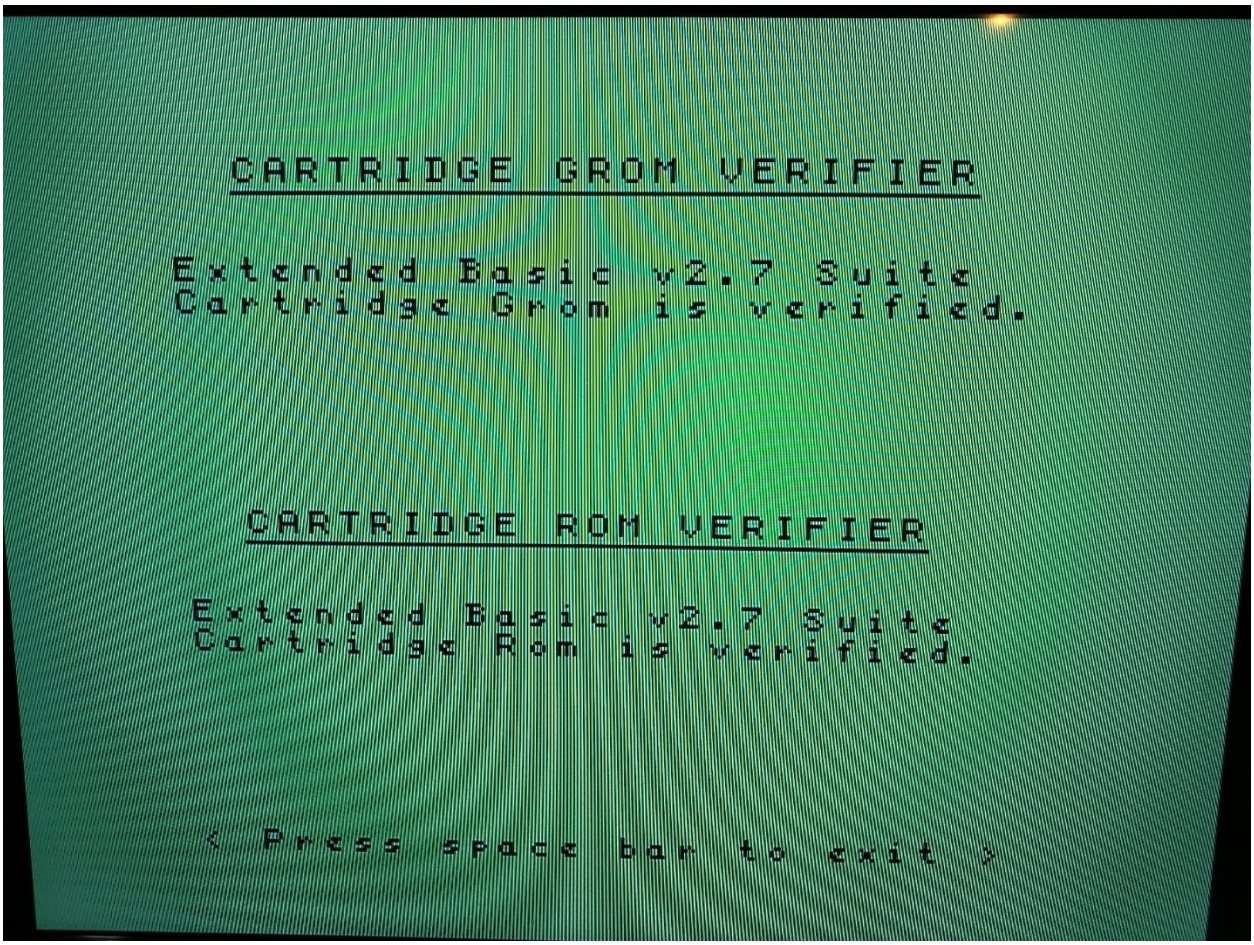



Extended Basic v2.7 Suite
R.V.R.
XB v2.7 Suite
XB27
TI-99/4A 512K FLASH ROM/CROM • 2014 JLF/JDG/TURSI/SC/MH
RESET Switch
(Normally Closed)

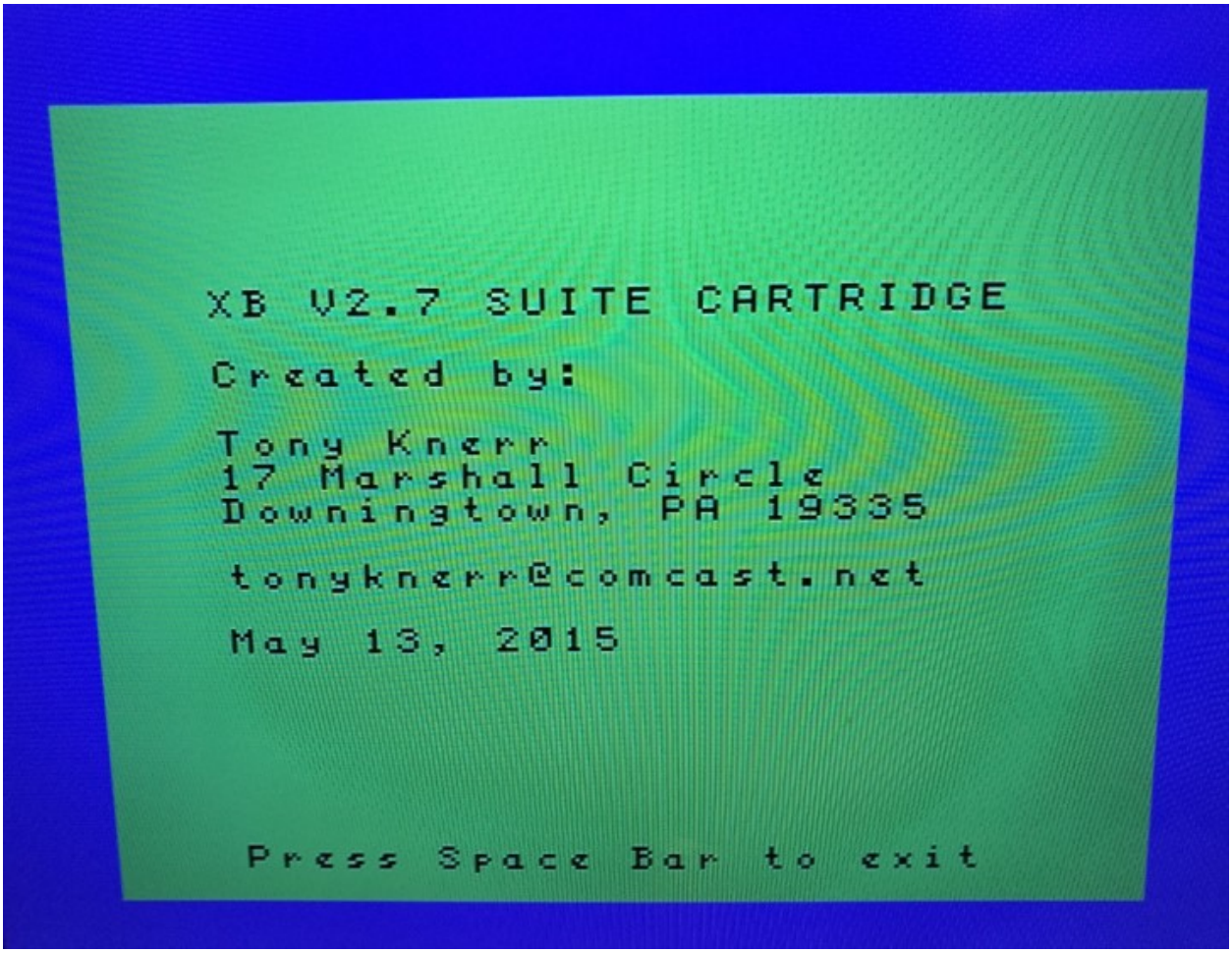


1. Use the XB27 Suite with 32K (press F7)
    a. e.g. with a nanoPEB (with CF card)
    b. or normal PEB + 32K + diskdrives

2. Press F6 to do verification (FCTN-6)



3. Press F7 for version (FCTN-7)



4. Press F5 for Ernie and Bert (FCTN-5)



Ti99Dir 6.2a 20150728

Files Tools Mark Commands Configuration Help

F: CF7A+ [256Mb]

Pc Name	Ti Name	Size	Type	Attr	Descr
..	..		UPRDIR		
VOL #0001	VOL1	1600	CF7A+DSK		
VOL #0002	CFHDX_V12	1600	CF7A+DSK		
VOL #0003	XB27SPEECH	1600	CF7A+DSK		
VOL #0004	SYSTEM1	1600	CF7A+DSK		
VOL #0005	SYSTEM2	1600	CF7A+DSK		
VOL #0006	PC-CONNECT	1600	CF7A+DSK		
VOL #0007	GRAMSYSTEM	1600	CF7A+DSK		
VOL #0008	GRAMSYSTEM	1600	CF7A+DSK		
VOL #0009	TELCO_V2.3	1600	CF7A+DSK		
VOL #0010	4A/DOS	1600	CF7A+DSK		
VOL #0011	ASSEMBLER1	1600	CF7A+DSK		
VOL #0012	ASSEMBLER2	1600	CF7A+DSK		
VOL #0013	ASSEMBLER3	1600	CF7A+DSK		
VOL #0014	ASSEMBLER4	1600	CF7A+DSK		
VOL #0015	ASSEMBLER5	1600	CF7A+DSK		
VOL #0016	ASSEMBLER6	1600	CF7A+DSK		
VOL #0017	ASSEMBLER7	1600	CF7A+DSK		
VOL #0018	ASSEMBLER8	1600	CF7A+DSK		
VOL #0019	ASSEMBLER9	1600	CF7A+DSK		
VOL #0020	ASSEMBL/10	1600	CF7A+DSK		
VOL #0021	ASSEMBL/11	1600	CF7A+DSK		
VOL #0022	ASSEMBL/12	1600	CF7A+DSK		
VOL #0023	ASSEMBL/13	1600	CF7A+DSK		

0 / 23475 sectors of 0 / 313 DSK-image[s]

D:\Data\TI\UbertCart-ImageBurn\Images\XB27SPEECH.dsk

Pc Name	Ti Name	Size	Type	Attr	Descr
..	..		UPRDIR		
XB27SPEECH.dsk	GROMLOAD	22	PROGRAM	P-	
XB27SPEECH.dsk	LOAD	4	PROGRAM	P-	
XB27SPEECH.dsk	XB27SPEECH	496	DIS/FIX	P-	
XB27SPEECH.dsk	BASICLOAD	9	PROGRAM	P-	

0 / 531 sectors in 0 / 4 TI-file[s]

Using nano-PEB

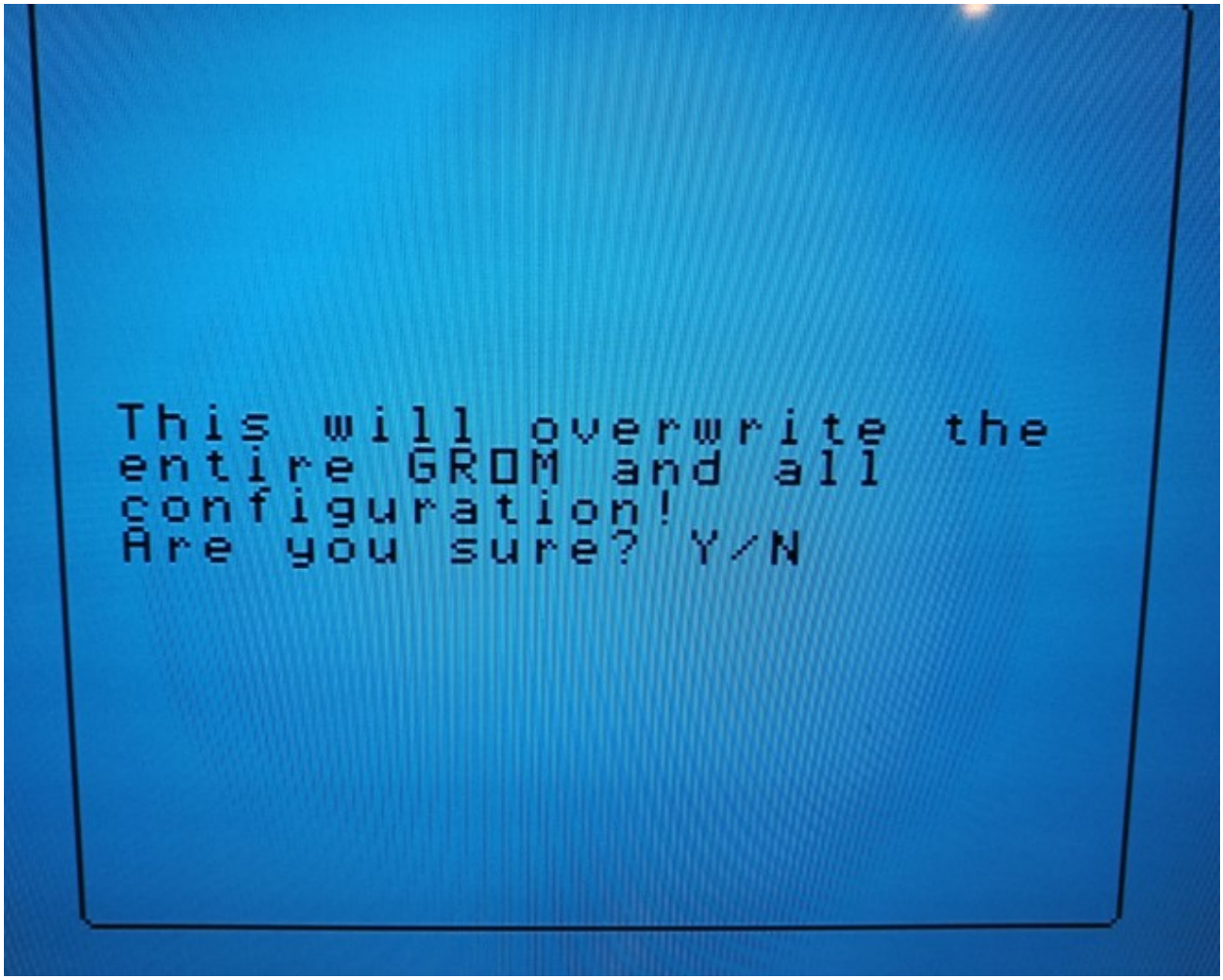
1. Goto to Extended Basic (e.g. keep pressing “A” until you see the prompt)

2. (for nano-PEB). CALL MOUNT(1,3), which means that DSK1 will be the XB27SPEECH disk (as it is VOL #0003)

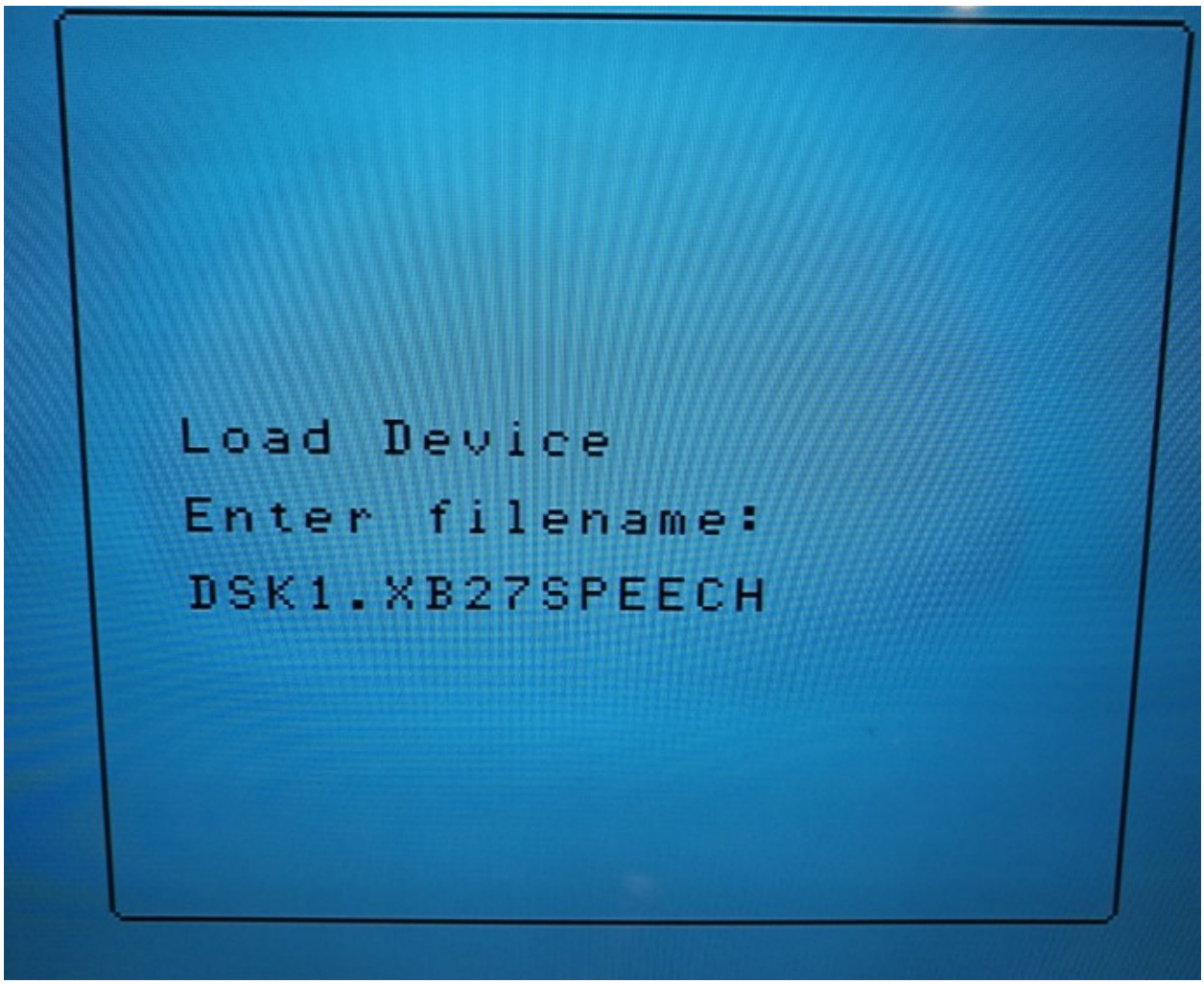
3. Press FCTN-= (QUIT)

4. Now load Extended Basic again, press A

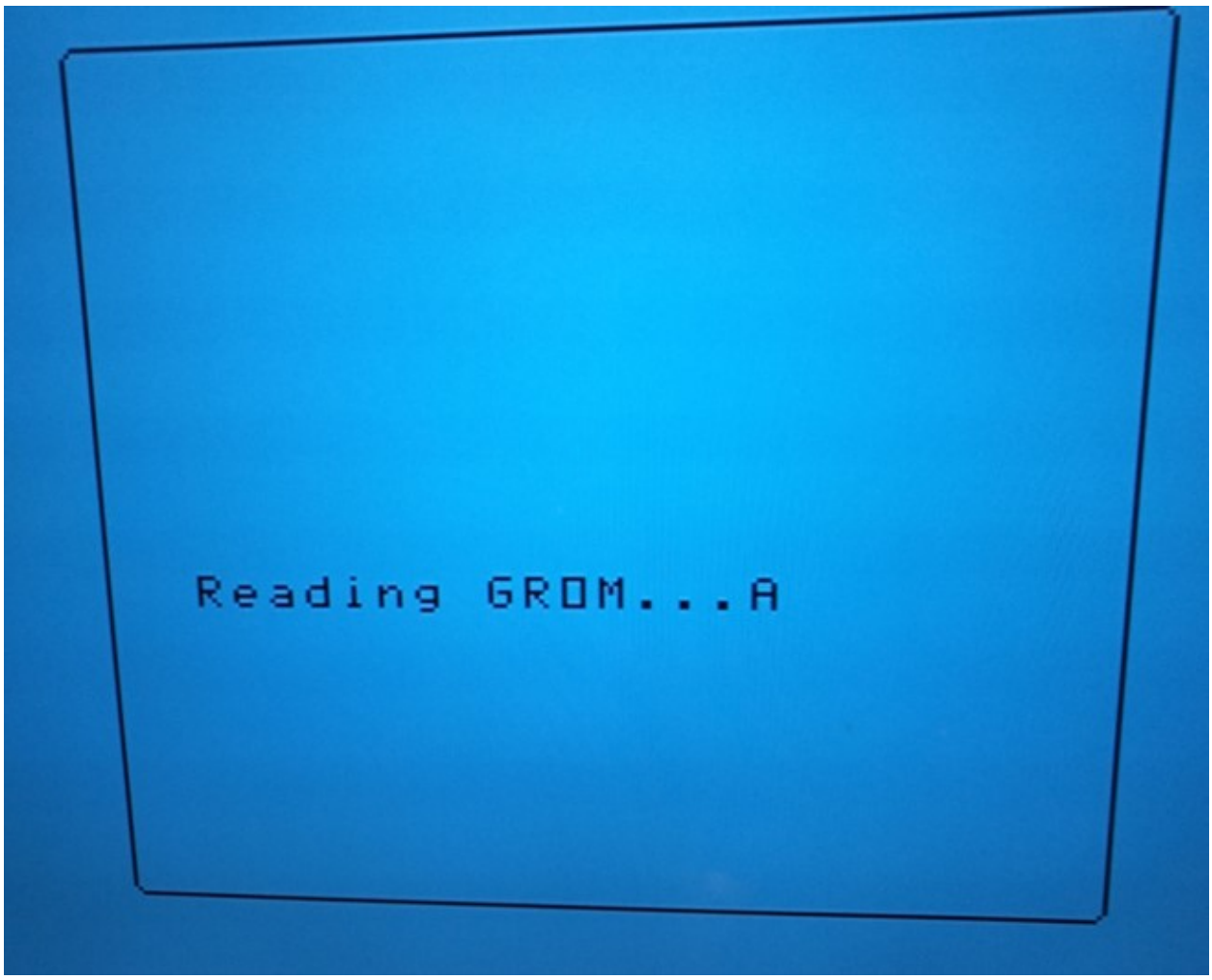
5. Automatically GROMLOADer is loaded

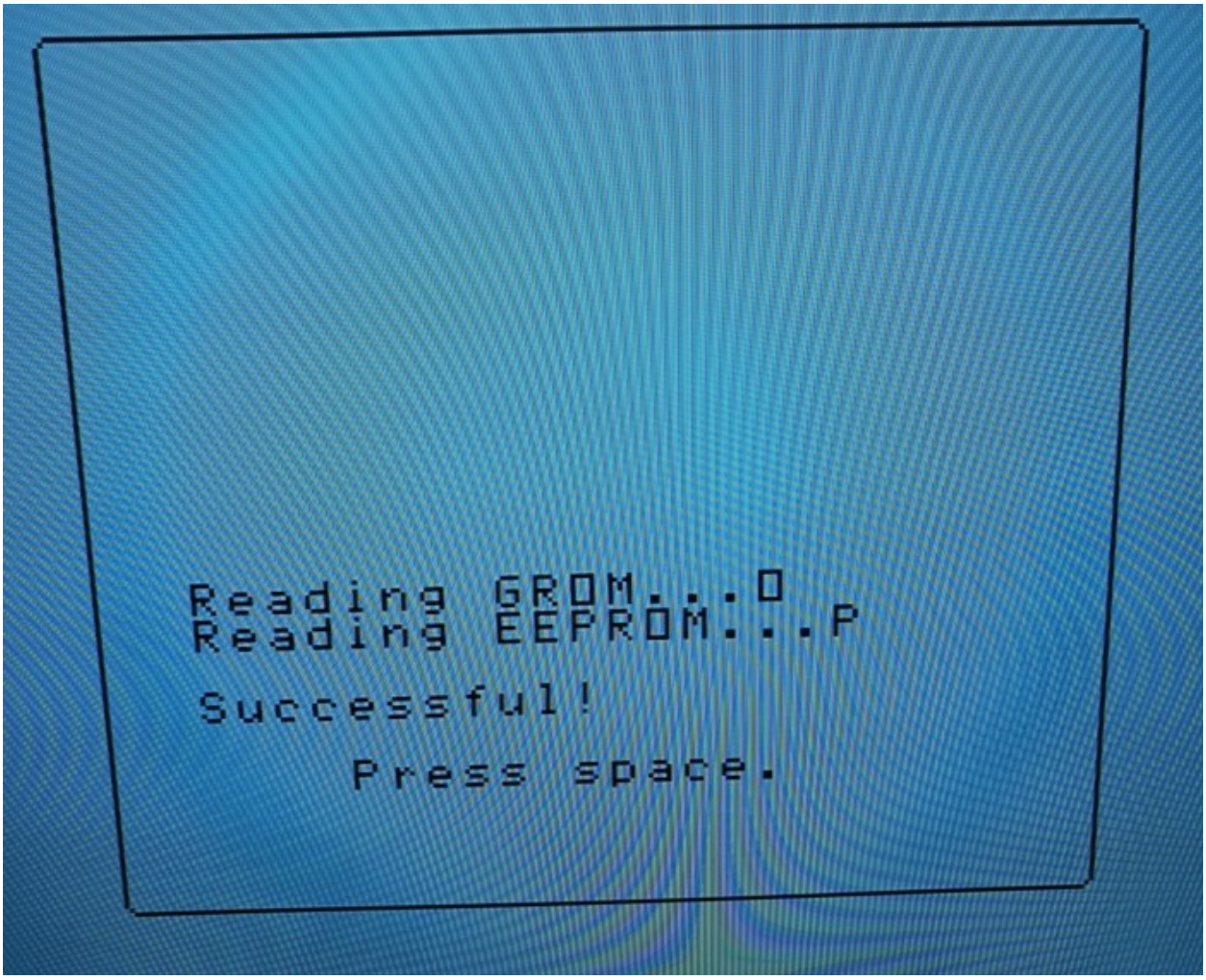


6. Enter DSK1.XB27SPEECH



7. Now it is reading GROM A, B, C, etc. until O and EEPROM P


Reading GROM...A



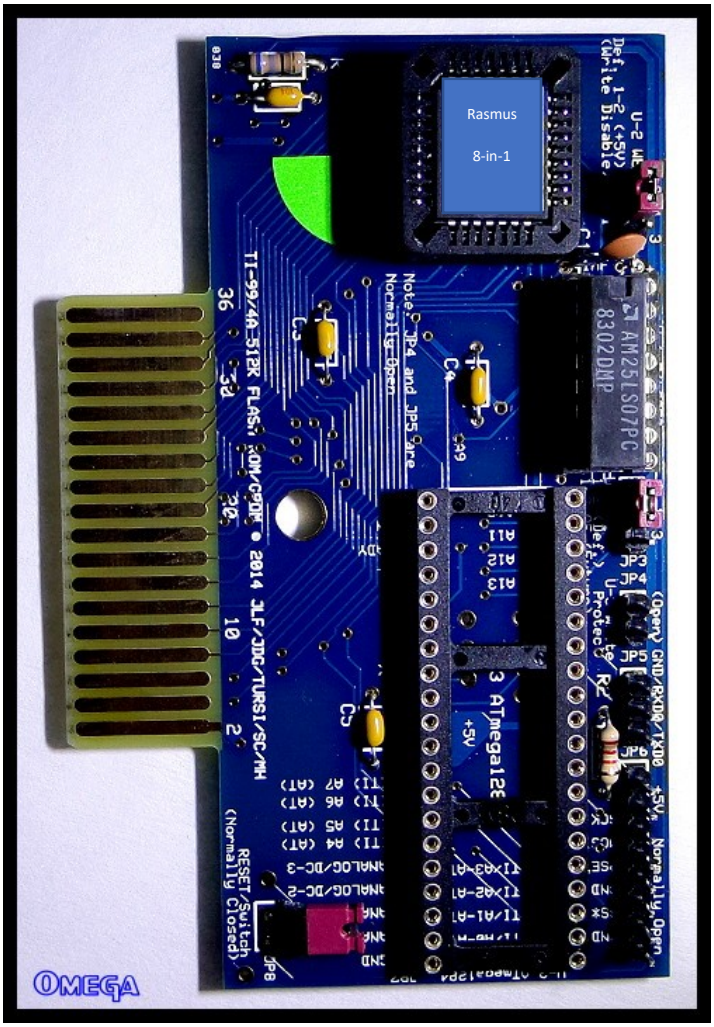
8. Wait until you see Successful

9. After this press “Space” and a reset is automatically done

10. Now you will hear XB 2.7 Suite saying, **“Texas Instruments Home Computer”**
    (you need to have the Speech Synthesizer connected and 32K)

Rasmus 8-in-1 cart inserted!
It runs without the ATMEGA1248P chip (but you can run with it as long you only load the 128K flash Startup file and not the EEPROM file (e.g. not the XB2.7 EEPROM file as it confuses the TI Program list

http://atariage.com/forums/topic/243766-bin-repository-images-for-burning-cartridges-5142017/page-3#entry3358452



Here is a 8-in-1 cartridge image with all my games together. It requires a 512K red board or a blue board without any GROMs loaded to run.



The games have been reassembled to ensure that you can soft reset (Fctn-quit) - at least from the title page - and that the F18A is properly reset/locked, which was causing problems on the old 3-in-1 cart.

The reason you cannot run the image on a blue board with any GROMs loaded is that all the entries in the menu are in use, and if you add another entry it starts to misbehave. I have tried it on a blue board with the **ATMega 1284 removed**, but I don't have a red board to test it with yet.

I have included the latest version of Bouncy on the image (the one with a bigger score range), but since this game is still in the test phase it is likely that I will update the image with a newer version later on.

EducartsRom.bin

It runs without the ATMEGA1248P chip (but you can run with it as long you only load the 128K flash Startup file and not the EEPROM file (e.g. not the XB2.7 EEPROM file as it confuses the TI Program list

Other useful AtariAge resources

http://atariage.com/forums/topic/230688-tl866cs-minipro-eprommer/

http://atariage.com/forums/blog/567/entry-12391-making-ones-own-cartridges-edited-12072015/

http://atariage.com/forums/topic/244707-preparing-an-avr-as-an-ubergrom/

http://www.harmlesslion.com/cgi-bin/showprog.cgi?search=grom

http://atariage.com/forums/topic/250878-snake-plissken-game-in-development/?p=3483459

http://atariage.com/forums/topic/250878-snake-plissken-game-in-development/?p=3483998