ROMShock User's Manual

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ROMShock

AVVISO

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IMPORTANTS

■ Plug and unplug the emulation PODs with TARGET SYSTEM switched off.

■ When possible power the emulator through the TARGET SYSTEM (Power Option JUMPER shorted and external power connector not used). This is a good method to avoid LATCH-UP problems.

■ When you are using external power feature you must supply power to emulator and TARGET SYSTEM at the same time.

SECTION 1
GENERAL FEATURES

ROMShock is an 8/16Bit ROM/EPROMEMULATOR with the following features :

- 8 Bit EPROM EMULATION from 27x256 to 27x080
- 16 Bit EVEN/ODD EPROM EMULATION
- JEDEC standard POD
- RESET and NEGATED RESET outputs
- CENTRONICS PARALLEL standard interface
- External or parasitic power supply
- Windows 3.1 or Windows95 software interface
- EXADECIMAL/ASCII dump window
- DOS version software
- Binary, Intel STD/EXT and Motorola S file formats
- High transfer rate (about 4.5 seconds for ½ Megabyte of code)

SECTION 2
KNOW THE EMULATOR

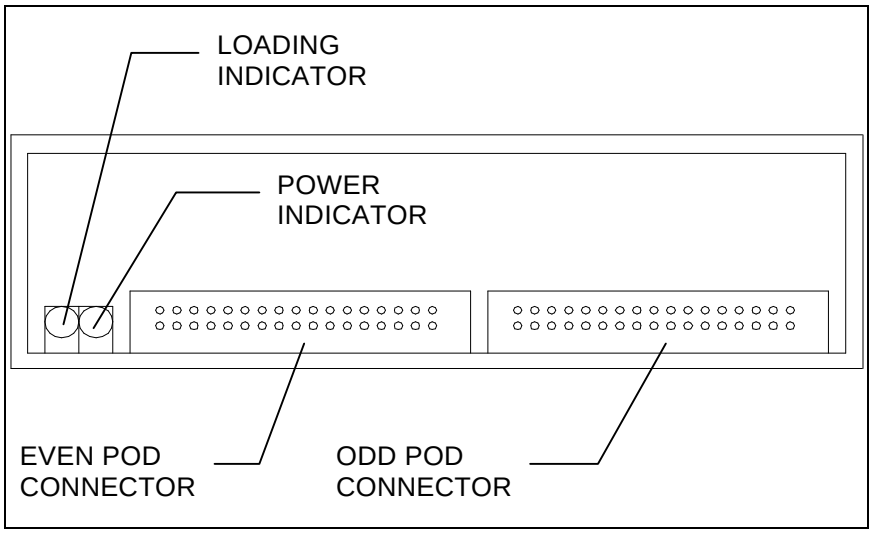


Figure 1 - The emulator front panel

2.1 Front Panel

On the front panel two 34-pin flat cable connectors are present. These connector are called EVEN and ODD PODs.
During a 8 Bit EPROM emulation (Mode SMALL 5-9) only the EVEN POD must be used.
In the modality 16 BIT EVEN/ODD 16 BIT both the EVEN/ODD POD are used (See section 5.1).
There are special modalities called LARGE MODES (Mode 10-15) where both EVEN/ODD pods are used but a special adapter ADP-LARGE 28-32, included in the kit, is required.
The POWER indicator indicate the presence of the power, the LOADING indicator is active during the loading session. Moreover this indicator signals a level change on the RST/RST# outputs in the emulator back.

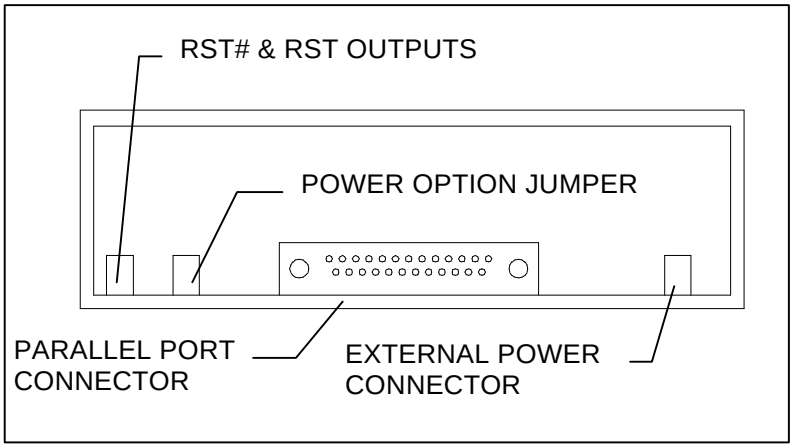


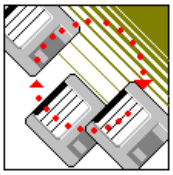
Figure 2 - The emulator back panel

2.2 Back

The 25-PIN connector must be connected to the personal computer's parallel port. (A 80cm flat cable is included in the kit for this purpose).
The two-poles connector present at the extreme left of the panel give the two RST e RST# outputs. The yellow-green crocodile cable must be plugged in here.
The connector placed at the right of the panel gives the external power capability . Use the black-red cable for this feature. **(REMEMBER TO UNSHORT THE POWER OPTION JUMPER WHEN USING THE EXTERNAL POWER METHOD).**
The power option jumper is placed at the left of 25PIN connector.
This JUMPER must be shorted when target-parasithic power method is used. Open this JUMPER when external power is supplied

NOTE : EXTERNAL POWER MUST BE 5V DC

SECTION 3
SOFTWARE SETUP



3.1 Software Setup

Software setup in Windows 3.x / Windows95 can be made launching the executable file SETUP.EXE present in the distribution diskette.
If you have Windows 3.x based system you can use FILE MANAGER, if you have Windows95 you can start the setup process selecting the SETUP.EXE from the computer resources. (Open the resource window, open the 3.5 floppy drive and double click on SETUP.EXE file).
The setup process is self-explanied..
If you need the DOS version of software you have to copy the files contained in the directory <\dosonly> of distribution diskette in your work directory. However, the executable file datazap!.exe is sufficent to use the emulator.

SECTION 4
CONNECTING THE EMULATOR

ROMShock has differents connecting methods. These methos change in accodance with of desidered emulation mode. For further information on emulation modes see the SECTION 5 - EMULATOR WORKING MODES.

4.1 SMALL MODE

The SMALL MODE permits to EMULATE, using the of EVEN POD only, all the devices from 27x256 to 27x040.
See Figure 3 for the connecting details.

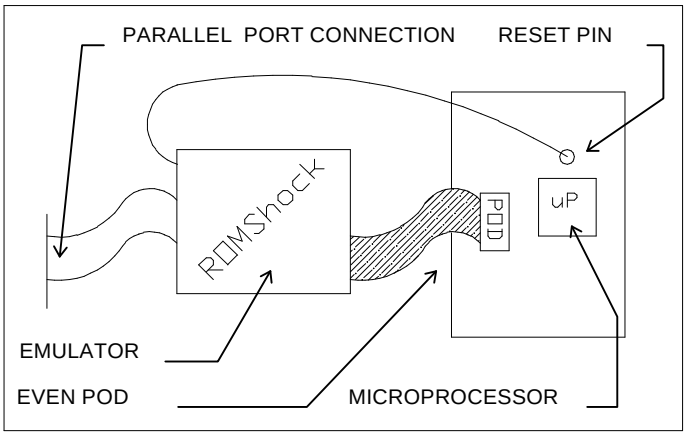


Figure 3 - Connecting in 8 BIT SMALLMODE

4.2 EVEN /ODD 16 BIT MODE

The 16 Bit EVEN/ODD mode permits to EMULATE at the same time two EPROM from 27x256 to 27x040 in modality EVEN/ODD.
Pay attention! The ODD POD of ROMShock can't be used to emulate devices independently . See SECTION 5 for further information on EVEN/ODD functions.

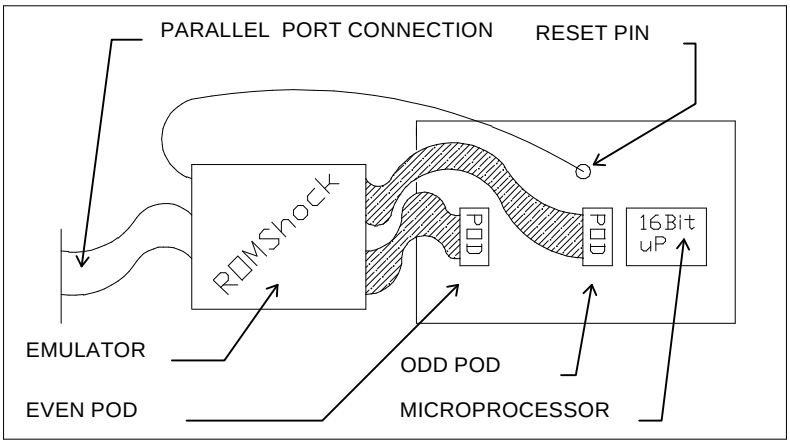


Figure 3 - 16 Bit EVEN/ODDconnecting

4.3 8 BIT LARGE MODE

The LARGE MODE is a special working mode that permits the extensions of the emulation capability up to 1 Mbyte allowing emulation of devices from 27x256 to 27x080. The LARGE MODE requires a particular adapter ADP-LARGE 28-32 included in the KIT
For further detail on this working mode see the SECTION 5.

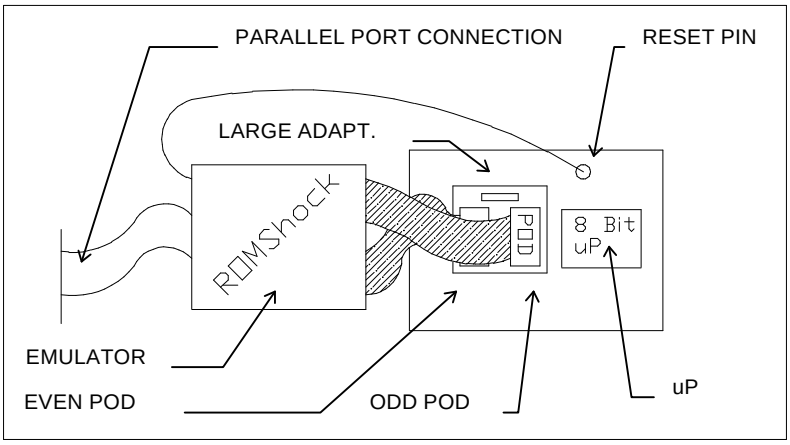


Figure 5 - 8 Bit LARGEMODE connecting

SECTION 5
EMULATORE WORKING MODES

5.1 The 16 emulation modes

ROMShock has 16 EMULATION MODES (0..15). You have to configure some parameters to obtain the desired EMULATION functionality. Use the table 1 to configure ROMShock.

Modes	Used PODS	Total KBYTES	Organiz.	ADP LARGE 28-32	28 Pins Adapter	datazap! Mode Flag
16 BIT EVEN/ODD- 512 **	POD 1 / POD 2	64	2 x 27C256	UNUSED	Note 1	-M0
16 BIT EVEN/ODD- 1024 **	POD 1 / POD 2	128	2 x 27C512	UNUSED	Note 1	-M1
16 BIT EVEN/ODD- 2048	POD 1 / POD 2	256	2 x 27C010	UNUSED		-M2
16 BIT EVEN/ODD- 4096	POD 1 / POD 2	512	2 x 27C020	UNUSED		-M3
16 BIT EVEN/ODD- 8192 *	POD 1 / POD 2	1024	2 x 27C040	UNUSED		-M4
SMALL 8 BIT - 256 **	POD 1	32	1 x 27C256	UNUSED	Note 2	-M5
SMALL 8 BIT - 512 **	POD 1	64	2 x 27C512	UNUSED	Note 2	-M6
SMALL 8 BIT - 1024	POD 1	128	1 x 27C010	UNUSED		-M7
SMALL 8 BIT - 2048	POD 1	256	1 x 27C020	UNUSED		-M8
SMALL 8 BIT - 4096 *	POD 1	512	1 x 27C040	UNUSED		-M9
LARGE 8 BIT - 256	POD1 / POD 2	32	1 x 27C256	**JP1 1-2**		-M10
LARGE 8 BIT - 512	POD1 / POD 2	64	1 x 27C512	**JP1 1-2**		-M11
LARGE 8 BIT - 1024	POD1 / POD 2	128	1 x 27C010	**JP1 2-3**		-M12
LARGE 8 BIT - 2048	POD1 / POD 2	256	1 x 27C020	**JP1 2-3**		-M13
LARGE 8 BIT - 4096	POD1 / POD 2	512	1 x 27C040	**JP1 2-3**		-M14
LARGE 8 BIT - 8192 *	POD1 / POD 2	1024	1 x 27C080	**JP1 2-3**		-M15

Table 1 - The emulator working modes

** Model XL only*
***Requires the 28 pins adapter ADP 32-28 included in thel KIT*

Note 1
To use 28 Pin devices in EVEN/ODD mode you can use the ADP 32-28 adapter for the ODD POD. For the EVEN POD you can use the ADP LARGE 28-32 adapter connecting the EVEN probe in the socket marked 'U1' and shorting the jumper 'JP1', always present in the adapter, on position 1-2. At this point you have to insert a 28 Pin socket in the 32 Pin socket in the adapter target-side. Take care to connect the Pin 14 of the new socket with the Pin 16 of the POD socket.
If the dimensions of the ADP LARGE 28-32 are excessive it's possible to build a simple 32-28 adapter. See the appendix of this manual for construction details.
Also, you can find the ADP-LARGE 28-32 schematic always in the appendix of this manual.

Note 2
To use 28 Pin devices in SMALL MODE you simply can use the ***ADP 32-28*** *adapter.*

5.2 THE 16 BIT EVEN/ODD MODE

In a typical 16 Bit system , the system memory can be organized as two 8 Bit banks. This means that the address lines driven by the micro are shifted of one position. (Address A1 of micro conencted to address A0 of the memory, address A2 of micro connected to address A1 of memory and so on ..). Obviosly all the address lines except the line A0 are commons for the two devices.
In fact, the address line A0 has the word's LOW / HIGH selection functionality.
With the 16 Bit EVEN/ODD mode you can emulate two 32 Pin EPROM devices.
Also you can emulate two 28 Pin devices using the two adapters included in the KIT (ADP LARGE 28-32, ADP 32-28).
A typical EVEN/ODD 16 Bit system is shown in Figure 6

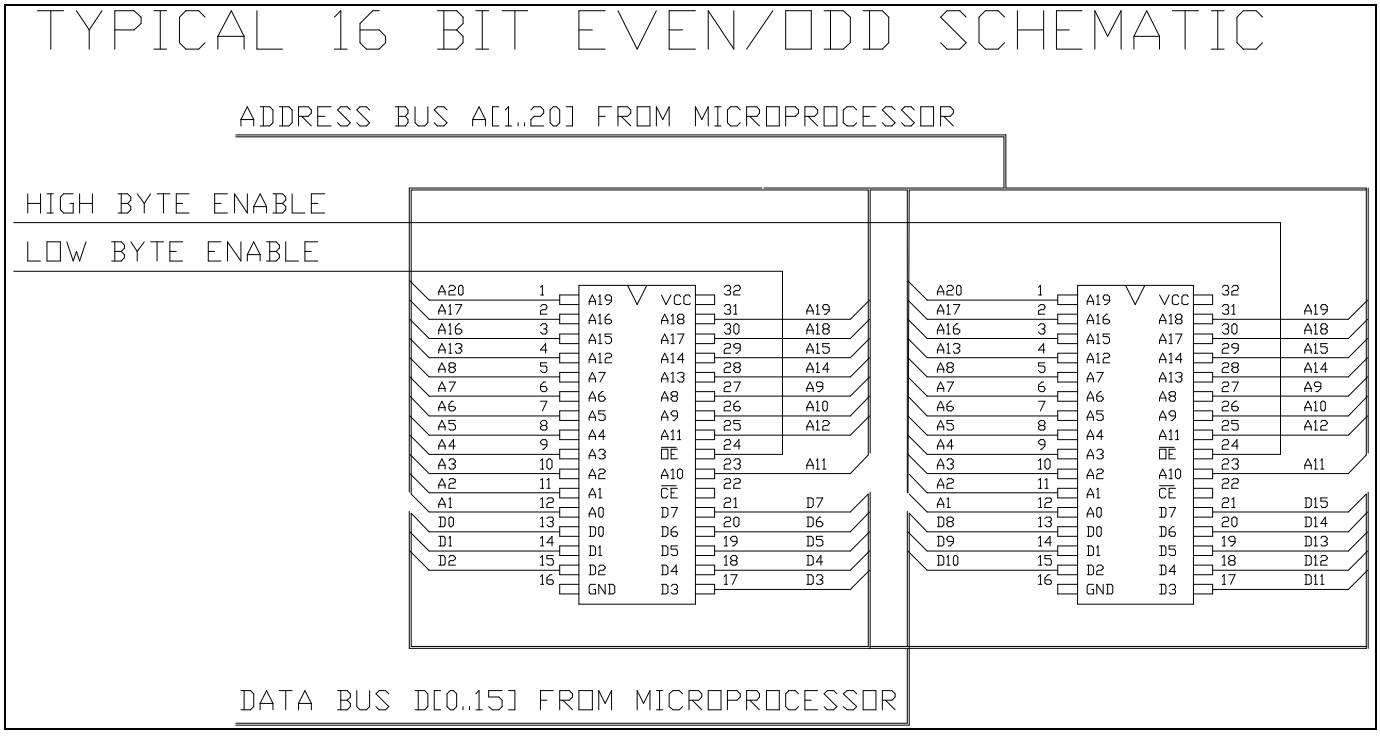


Figure 6 -16 Bit EVEN/ODDconfiguration

5.3 THE SMALL 8 BIT MODE

The ROMShock's circuitry it's formed by two distinct DATA sections. This means that if one section is unused, all the memory relative to that section is lost. This is not a problem if the requested emulation memory is limited to 512 Kbytes (256KB for the **S** model). If you need more emulation memory you can use the LARGE 8 BIT MODE.
The SMALL mode foresees the using of the POD#1 only (EVEN POD).
To use 28 Pins devices it's necessary to use the adapter **ADP 32-28.**

5.4 THE LARGE 8 BIT MODE

The LARGE 8 BIT mode may be activated using the special adapter **ADP-LARGE 28-32** (see Figure 4) included in the KIT. This adapter permits the use of all the available memory to emulate devices from 27C256 (32Kx8) alla 27C080 (1Mx8).
If you have the **S** model the emulation is limited to 27C040 (512Kx8).

5.5 THE LARGE ADAPTER

Below is reported the ADP-LARGE 28-32 layout. The ADP-LARGE 28-32 adapter may be used to emulate 28 Pins devices too. For this purpose use the SMALL MODE with the EVEN POD only. The JUMPER (in the high side of the board) must be configured in position 1-2. With 32 Pin devices, the JP1 JUMPER must be configured in position 2-3.

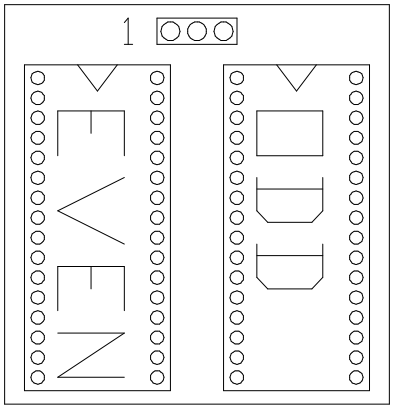


Figure 4 - The ADP-LARGE 28-32 LARGE ADAPTER

SECTION 6
ROMSHOCK.EXE
WINDOWS 3.1 / 95 PROGRAM INTERFACE

The Windows ROMShock program could be considered as an accessory to keep in the Windows's desktop giving the possibility to activate code loading at any moment..
A typical work enviroment could consist of a DOS-Shell where you launch your compiler or assembler and the ROMShock program.
When the compiling phase is terminated you simply have to press the LOAD button on the ROMShock program's panel to activate the code loading.
In the program's panel, there are four buttons plus a big button with the product's logo. Pressing the big button will display the general program information. The four buttons activates respectively the fundamental functions of the program.

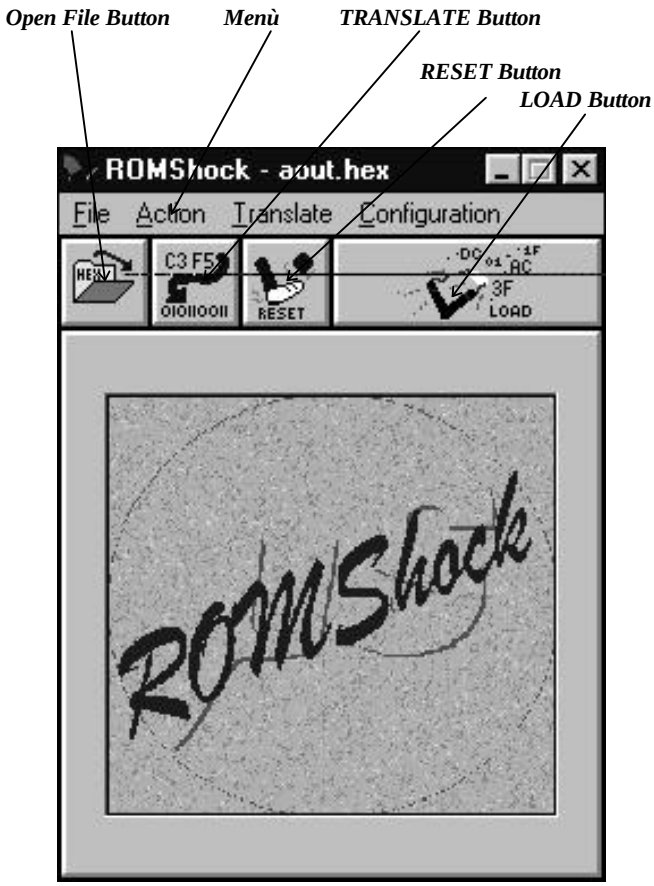


Figure 8 - The main windowof ROMShock program

Open File Button

Pressing this button will access the Windows standard load-dialog.
You can select Intel Std/Ext, Motorola S, or binary file type.
Pay attention! The file extension is independent from in wich the file is interpreted. The translating mode must be setted in the CONFIGURATION DIALOG in this same section described.
The currently selected file could be saved as DEFAULT file at program startup by simply giving a configuration save command.
The configuration-save command is available trough the 'Configuration' menu with the 'Save Configuration' selection.
The ' Open File' function is available through the File Menu too

Translate Button

The TRANSLATE function can be used to convert files. This is useful during the devolpement process to generate programmer's files .BIN or .IMG. The TRANSLATE function can process Intel STD/EXT and Motorola S 16/24 Bit formats.
If the 'Auto Detect' option in the configuration DIALOG is active, the software automatically checks for the .HEX/.S native extensions
If one of these extensions is found the program activates the associated conversion.The program, by default, generates a binary file (.BIN).
If the Image option in the configuration dialog is active the program will generate a image file (.IMG).
A image file is a file with dimension equal to the difference between the highest address and the lowest address, addresses obviously refer to the input file. The parts not covered by addresses are filled with the constant 255 (0xFF).

RESET Button

The RESET button permits a transition on signals RST and RTS#, present on connector in the back panel. By connecting one of these signals on the RESET pin of your TARGET MICROPROCESSOR, it will be possible to reset your TARGET by simply pressing this button.

LOAD Button

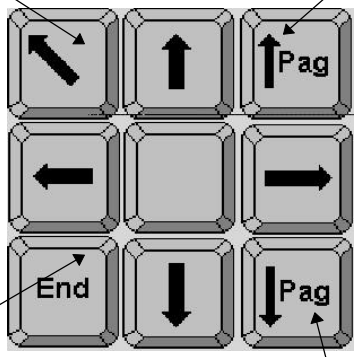
The LOAD button loads, into the emulator, the file currently selected. Pressing this button a progress-bar will appear.
At the same time the LOADING LED in the front panel will light.
During the LOAD session the RST and RST# signal becomes active.

6.1 The HexVIEW Window

The HexVIEW window, to be activated through the 'Action' menù with 'HexVIEW' selection, allows the display the the currently selected file in HEXADECIMAL and ASCII format.
The HexVIEW window can be used to check code allocation.
You can scroll the entire file with the following key combinations :

'Home' KEY
Beginning
of file.

'Page Up' KEY
Scroll back of 256 Bytes, 4096 Bytes or 64K depending on the state of the SHIFTand CONTROL keys.



'End' KEY
End of file

'Page down' KEY
Scroll up of 256 Bytes, 4096 Bytes or 64K depending on the state of the SHIFT and CONTROL keys.

Scrolling function key-table

PAGE UP	Scroll back of 256 Bytes
SHIFT + PAGE UP	Scroll back of 4096 Bytes
CONTROL + PAGE UP	Scroll back of 64 KBytes
PAGE DOWN	Scroll up by 256 Bytes
SHIFT + PAGE DOWN	Scroll up by 4096 Bytes
CONTROL + PAGE DOWN	Scroll up by 64 KBytes

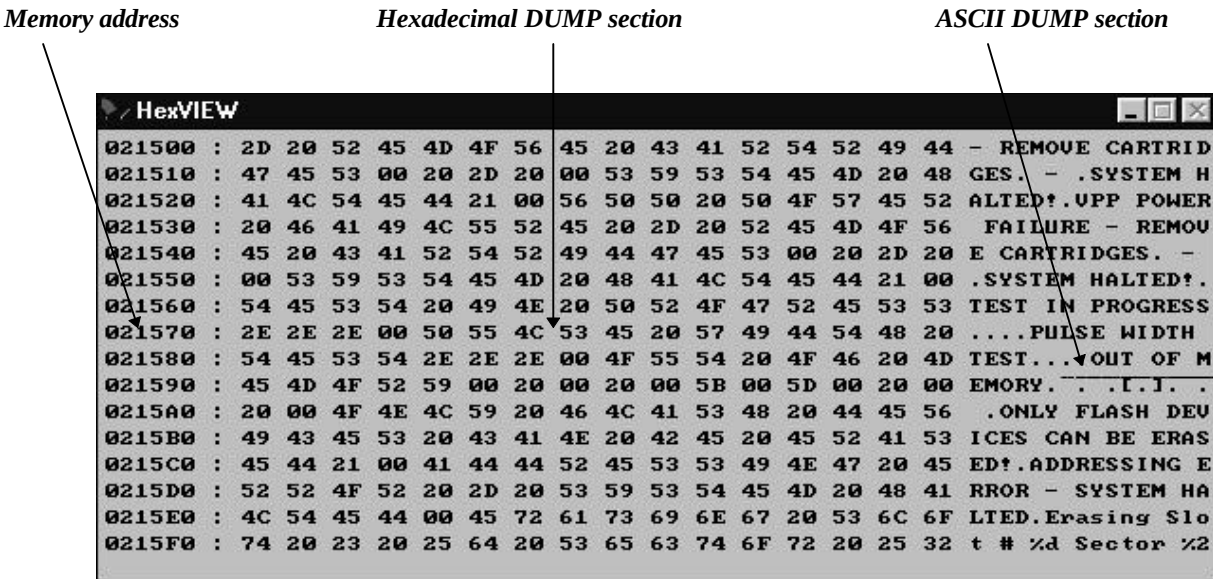


Figure 9 - The HexVIEW window

6.2 The Configuration Window

The configuartion DIALOG of the ROMShock program is accessible through the Configuration menu with the selection Config.
Through the configuration DIALOG it's possible to change some parameters like the EMULATION MODE, the input file format and the LOAD OFFSET. Once these parameters are set, you can keep this configuration performing a save configuration command (Available through the configuration menu with selection Save Config).
The ROMShock configuration will be saved (in a binary format) in the file <\windows\rshock.ini>.

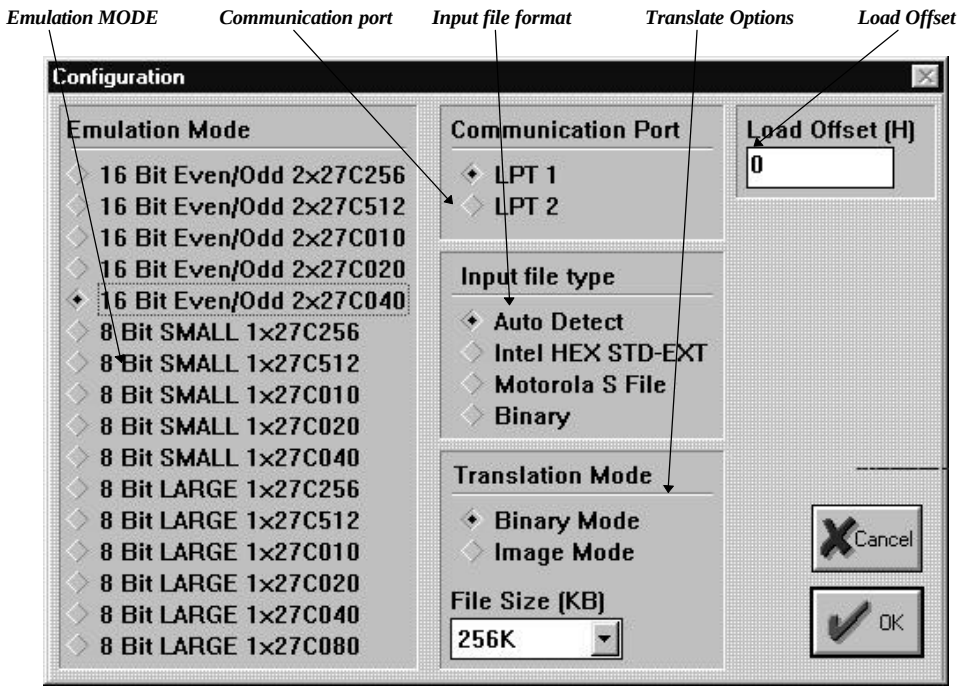


Figure 10 - The configuration DIALOG

6.2.1 Emulation Mode Radio Button

Use the EMULATION MODE RADIO BUTTON to set the emulation mode. For details about the emulation mode see the SECTION 5 and in particular the Table 1.

6.2.2 Communication Port

The COMMUNICATION PORT RADIO BUTTON selects the parallel communication port of your PC where the emulator is connected.

6.2.3 Input File Type

The INPUT FILE TYPE RADIO BUTTON tell the program how the input file has to been translated. Three kind of files are recognized : Intel STD/EXT, Motorola S and BINARY files.
Using the AUTO DETECT mode, automatically the program tries to detect the input file format.

6.2.4 Translation Mode

In the TRANSLATION MODE group are enclosed the file translation options. The TRANSLATE function converts a .HEX / .S file in a BINARY or BINARY IMAGE file.
Through this options it's possible to select the binary output file format and its size (BINARY mode only).
Obviously the size of the binary file is restricted to the powers of two.

6.2.5 Load Offset

In this field it's possible to set a LOAD OFFSET.
The offset must be written in HEXADECIMAL format in the range 0-FFFFF.

SECTION 7
USING THE EMULATOR UNDER MS-DOS
THE DATAZAP!.EXE PROGRAM

7.1 DATAZAP!.EXE GENERAL SYNTAX

The DOS version of ROMShock (DATAZAP!.EXE) allows the loading of files into the emulator with the DOS operating system only. This is useful to create batch programmes.
The general syntax to use this program is the following :

DATAZAP! [switches] filename.ext

This table reports the switches summary

Switch	Description
-Mx	Functional Mode (See Table) x = 0..15 (Default = 0)
-Fx	File Format x = I Intel Standard e Intel Extended x = S Motorola S Files x = B BINARY Mode
-R	Generate a Reset (250ms Pulse)
-Nx	Port Number x = 1 LPT1 x = 2 LPT2 (Default)
-Ohhhhhh	File Offset
-T	Translate Mode
-I	Image Generation
-Skkkk	BINARY file size
-H	Display Help Page

Table 2 - The datazap!.exe switches

7.2 DATAZAP!.EXE SWITCHES

SWITCH -Mx (FUNCTIONAL MODE)
The -Mx switch sets the EMULATION MODE. Refer to SECTION 5 and Table 1 for details.

SWITCH -Fx (FILE FORMAT)
This switch sets the input file format. The software can translate three formats : Intel STD/EXT, Motorola S 16/24 Bit and BINARY files. The software automatically checks for the natural extensions .HEX /.S / .BIN. If one of these extensions are found the software activates the associated conversion. If the extension is ommited and the -Fx switch wasn't used , the software assumes for default the .BINARY format.

SWITCH -R (GENERATE RESETPULSE)
The -R switch is an alternative mode to send a RESET PULSE to the TARGET SYSTEM without operating directly on the HARDWARE. Using this option the program simply generates a transition on outputs RST / RST# (these outputs obviously are to be connected to the microprocessor reset input pin). The implse width is about 250ms.

SWITCH -Nn (PORT NUMBER)
Use this switch to select the parallel port where the emulator is connected.

SWITCH -Ohhhhhh (File Offset)
With this switch it's possible to add a LOAD OFFSET to the input file loading addresses.This offset must be supplied in HEXADECIMAL FORMAT in the range from 0(h) to FFFFF(h).

SWITCH -T (TRANSLATE MODE)
The -T switch selects the FILE TRANSLATE OPERATING MODE
This mode allows the use of the datazap!.exe program as a file converter utility. Detail about this mode is explained in SECTION 8.

SWITCH -I (IMAGE MODE)
This switch, in combination with the switch -T tells to the program to generate IMAGE files (.IMG) instead of the BINARY default format (.BIN).

SWITCH -Skkkk (BINARYFILE SIZE)
This switch, in combination with the switch -T (Don't use with the -I switch) sets the output file size. The areas, uncovered by any address, relative to the input file, will be filled with the constant FF(h). The kkkk parameter must be supplied in decimal notation in the range from 32 to 1024.

SWITCH -H (HELP PAGE)
The program syntaxs and a short description of the main features can be displayed using this switch.

7.3 CARICAMENTO DEI FILES CON DATAZAP!.EXE

Loading a file on the emulator with datazap!.exe is really easy.
We assume that your linker give as output a Intel STD/EXT or Motorola .S or a pure BINARY file.
To start the loading you just have to write :

datazap! FileName.ext -Mx

Pay attention to the emulation mode selected by the switch -Mx.
Once started, the program will display some input file parameters and the data transfer will begin. On your display you can see the transferred byte count and at the end you can obtain the elapsed time.
The LOADING LED will be active for all the transfer time. At the same time the RST / RST# outputs are active. This allows the TARGET CPU in the RESET STATE to be kept.
Terminated the transfer, the RST and RST# outputs change their state and the LOADING LED turns off (CPU RUNNING STATE).

SECTION 8
FILES CONVERSION USING DATAZAP!.EXE

8.1 FILES CONVERSION

As just mentioned, datazap!.exe can be used as a file converter utility. This is really useful at the end of the developing process to generate the programmer BINARY or IMAGE files to obtain the final ROM / EPROM. In TRANSLATE mode, the software can detect the Intel STD/EXT, Motorola S 16/24 Bit files formats.
The software automatically checks for the .HEX / .S native extension and if one of these extensions are found, the program activates the associated conversion. The program generates a pure BINARY file (.BIN) or a BINARY IMAGE file if the -I switch is used.
An image file is a file of dimension equal to the difference between the highest address and the lowest address, addresses obviously refering to the input file. The parts not covered by any addresses are filled with the constant 255 (0xFF).
To invoke a conversion just write :

datazap! FileName.ext -T [-I]

Table 3 reassume the conversion combinations.

Desired conversion	*Command Line (If extension supplied)*	*Command Line (Extension not supplied ot extension different by the defuult)*
.HEX -> .BIN	*datazap! FileName.hex -T*	*datazap! FileName.xxx -T -FI*
.HEX -> .IMG	*datazap! FileName.hex -T -I*	*datazap! FileName.xxx -T -I -FI*
.S -> BIN	*datazap! FileName.s -T*	*datazap! FileName.xxx -T -FS*
.S -> IMG	*datazap! FileName.s -T -I*	*datazap! FileName.xxx -T -I -FS*

Table 3 - Translating modes

APPENDIX A
TECHNICAL AND PHISICAL CHARACTERISTICS

Electrical characteristic

***Power** supply*	*5V DC +-5%*
External supply	*5V DC +-5%*
Average working current	*140 mA*

Phisical Characteristics

Working temperature range	*0 - 45 °C*
Weight	*150 g*

DC electrical input characteristics (signals A[14..19])

SYMBOL	PARAMETER	CONDITION	MIN.	TYP.	MAX	UNITS
***V**IL*	*Input Low Voltage*		*Vss-0.5*	-	*0.8*	*V*
***V**IH*	*Input High Voltage*		*2.00*		*Vcc+1*	*V*
***I**IL*	*Input LowLeakage Current*	*0V£**V**IN£**V**IL*	-	-	*-100*	*mA*
***I**IH*	*Input High Leakage Current*	*3.5V£**V**IN£**V**CC*	-	-	*10*	*mA*

DC electrical input characteristics (signals A[0..13])

SYMBOL	PARAMETER	CONDITION	MIN.	TYP.	MAX	UNITS
***V**IL*	*Input Low Voltage*		*Vss-0.5*	-	*0.8*	*V*
***V**IH*	*Input High Voltage*		*2.00*		*Vcc+1*	*V*
***I**IL*	*Input LowLeakage Current*	*0V£**V**IN£**V**IL*	-	-	*-100*	*mA*
***I**IH*	*Input High Leakage Current*	*3.5V£**V**IN£**V**CC*	-	-	*10*	*mA*

Sswitching AC characteristics

SYMBOL	DESCRIPTION	CONDITION	MIN.	TYP.	MAX	UNITS
tad	*Address IN to data OUT*		*95*	*100*	*115*	*ns*
tced	*Chip Enable In to Data Out*		*15*	*20*	*25*	*ns*
toed	*Output Enable In to Data Out*		*15*	*20*	*25*	*ns*
toedf	*Output Enable Data Float*		*15*	*20*	*25*	*ns*

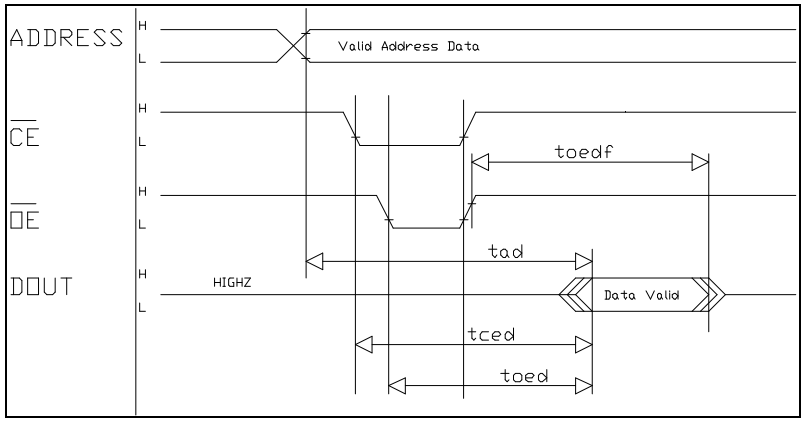


Figure 11 - AC WAVEFORMS

APPENDIX B
HARDWARECONSIDERATIONS

In this section you can find useful information about the ROMShock Hardware. This information may be useful if you want to use ROMShock with particolar TARGET systems in non-standard working enviroment. If you have system instability, it is best if you analyze the interface section first.

No emulators in the world can grant 100% compability with the original emulated device.

To give help to the designer we report the FRONT-END section of the emulator.

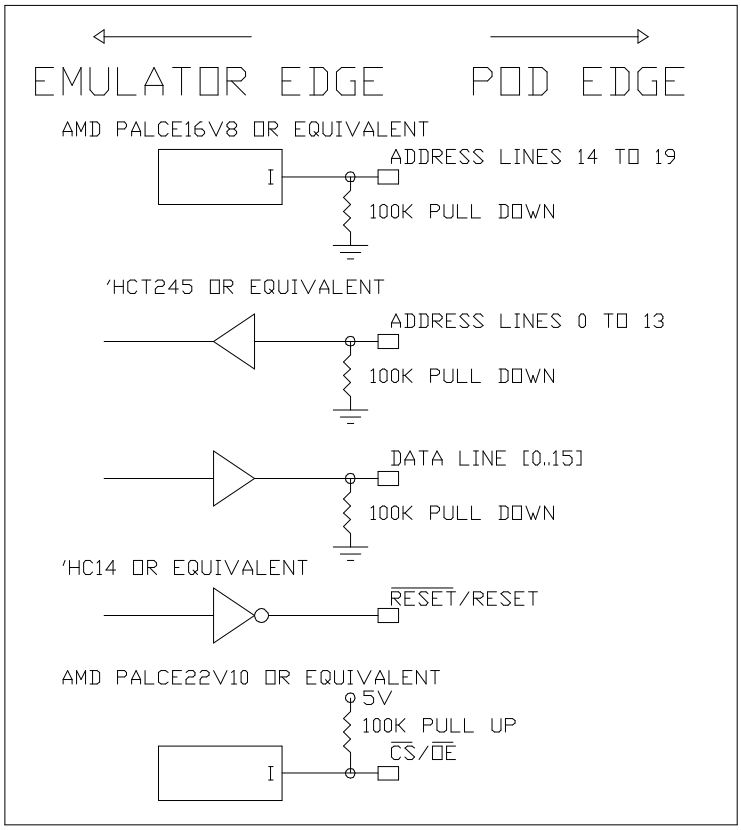


Figure 12 - EMULATOR FRONT-END

APPENDICE C
EPROM PINOUT

Figure 13 reports the JEDEC standard pinout for all the devices from 27x256 to 27x080

8Mbit	4Mbit	2Mbit	1Mbit	512K	256K
A19	VPP	VPP	VPP	---	---
A16	A16	A16	A16	---	---
A15	A15	A15	A15	A15	VPP
A12	A12	A12	A12	A12	A12
A7	A7	A7	A7	A7	A7
A6	A6	A6	A6	A6	A6
A5	A5	A5	A5	A5	A5
A4	A4	A4	A4	A4	A4
A3	A3	A3	A3	A3	A3
A2	A2	A2	A2	A2	A2
A1	A1	A1	A1	A1	A1
A0	A0	A0	A0	A0	A0
D0	D0	D0	D0	D0	D0
D1	D1	D1	D1	D1	D1
D2	D2	D2	D2	D2	D2
GND	GND	GND	GND	GND	GND

JEDEC PINOUT

VPP/A19	1	32	VCC
A16	2	31	PGM/A18
VPP/A15	3	30	VCC/A17
A12	4	29	A14
A7	5	28	A13
A6	6	27	A8
A5	7	26	A9
A4	8	25	A11
A3	9	24	$\overline{OE}$/VPP
A2	10	23	A10
A1	11	22	$\overline{CE}$
A0	12	21	D7
D0	13	20	D6
D1	14	19	D5
D2	15	18	D4
GND	16	17	D3

256K	512K	1Mbit	2Mbit	4Mbit	8Mbit
---	---	$\overline{VCC}$	$\overline{VCC}$	$\overline{VCC}$	$\overline{VCC}$
---	---	$\overline{PGM}$	$\overline{PGM}$	A18	A18
VCC	VCC	---	A17	A17	A17
A14	A14	A14	A14	A14	A14
A13	A13	A13	A13	A13	A13
A8	A8	A8	A8	A8	A8
A9	A9	A9	A9	A9	A9
A11	A11	A11	A11	A11	A11
$\overline{OE}$	$\overline{OE}$/V	$\overline{OE}$	$\overline{OE}$	$\overline{OE}$	$\overline{OE}$/V
A10	A10	A10	A10	A10	A10
$\overline{CE}$	$\overline{CE}$	$\overline{CE}$	$\overline{CE}$	$\overline{CE}$	$\overline{CE}$
D7	D7	D7	D7	D7	D7
D6	D6	D6	D6	D6	D6
D5	D5	D5	D5	D5	D5
D4	D4	D4	D4	D4	D4
D3	D3	D3	D3	D3	D3

PIN NAMES

A0 - A19	ADDRESSES
D0 - D7	DATA OUTPUTS
CE	CHIP ENABLE
OE	OUTPUT ENABLE
VCC	POWER SUPPLY
GND	GROUND
$\overline{PGM}$	PROGRAM PULSE
---	UNCONNECTED IN THAT DEVICE

Figure 13 - EPROM PINOUT

APPENDICE D
FILE FORMATS

The Intel-Standard and Intel-Extended file format

Symbol	Contents	Explanation
:	Record Mark	Beginning of the Record
Lenght	Record Lenght	Lenght of Record
Address	Address	Load Address
Type	Type	Record Type
Data	Data	One Byte of Data
CheckSum	CheckSum	The sum of all bytes (MOD 256), including the checksum itself, should be zeo.
CR	Carriage Return	Carriage Return = ODH
LF	Line Feed	Line Feed = 0AH

INTEL .HEX FILE EXAMPLE

```
:020000040001F9
:0AE1000053439A000000A808000035
:01E1A4004535
:10000000C238A9A8081BF40000F442093B5BA9FF11
:100010000A8FF20A00A900008FF40A00A9FF7F8F5F
:10002000F60A00A900008FF80A00A20000A0B001A3
:10003000D0038AF00EF8A900889701D0FBC603CA46
:1000400010F6D8D8A900008FFA0A008FFC0A00F831
:100050008FFE0A00D822F2000148221A3701CBDBBA
:0700600080FC6B8000000032
:020000040000FA
:10F000005C54F0005C54F0005C54F0005C54F00080
:00000001FF
```

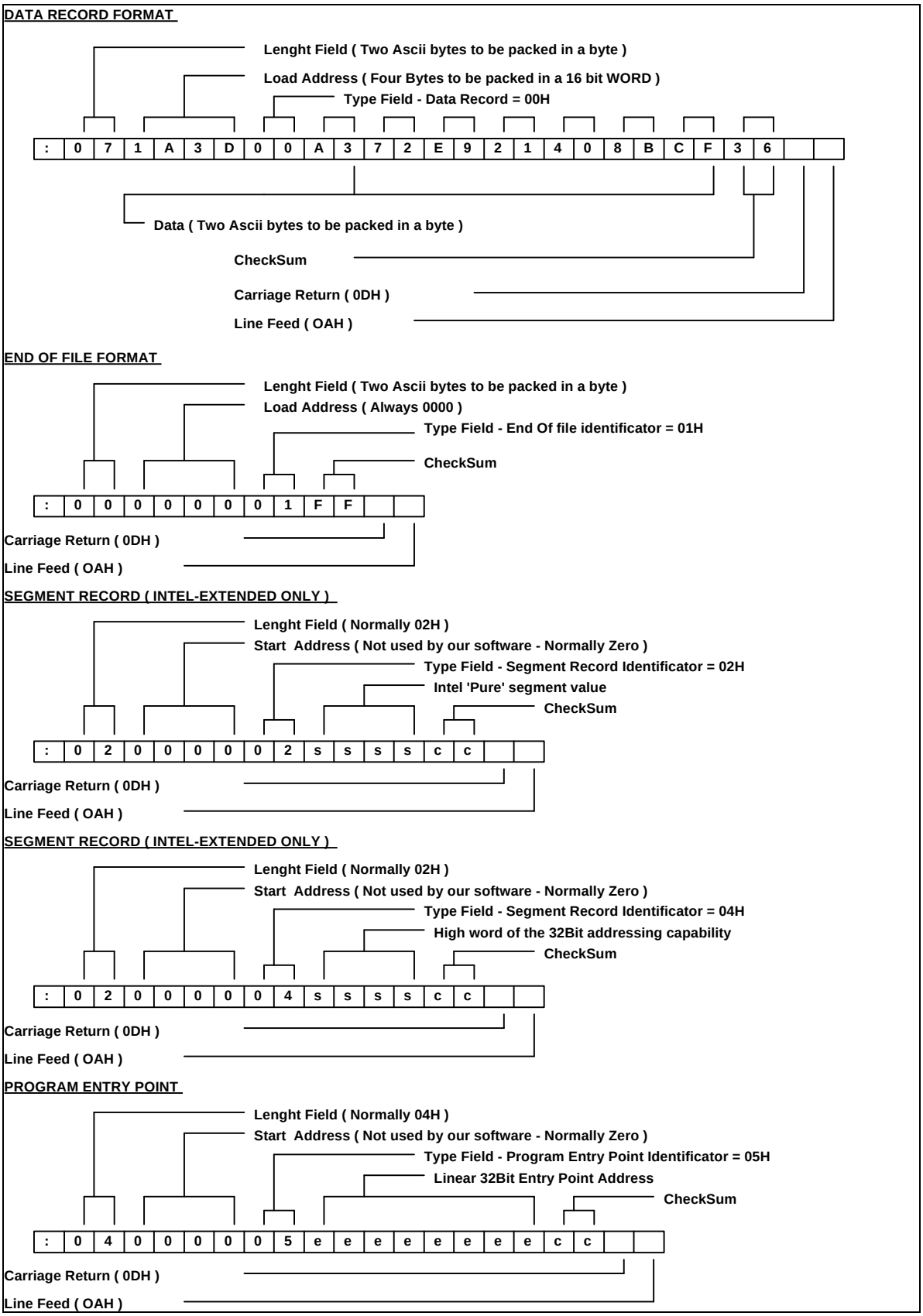


Figure 14 - Intel STD/EXTFile Format

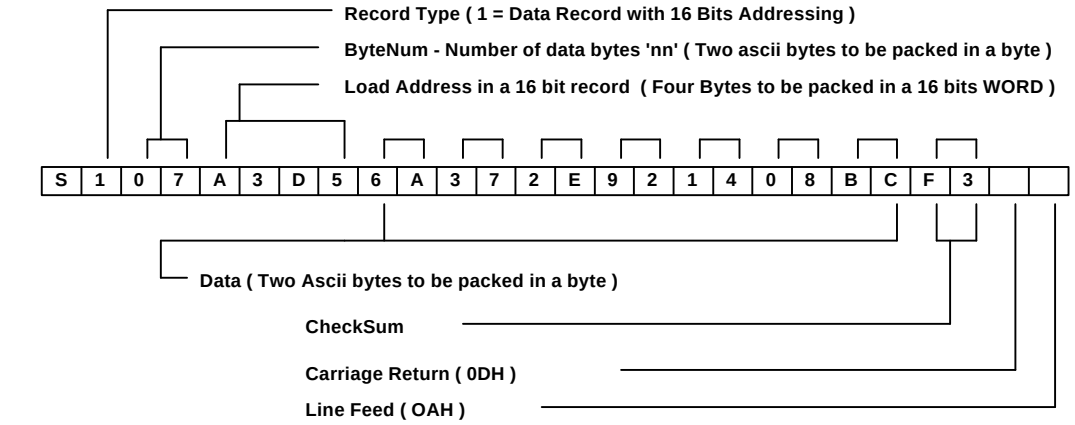
The Motorola S files format

Symbol	Contents	Explanation
S	Record Mark	Beginning of the Record
Record Type	Record Type	See The Explanations
ByteNum	Bytes Number	Number of Bytes
Address	Address	Load Address (16 or 24 Bits)
Data	Data	One Byte of Data
CheckSum	CheckSum	Given by the formula : (255 - (Sum of all bytes from Load Address to the last data byte) MOD 256
CR	Carriage Return	Carriage Return = ODH
LF	Line Feed	Line Feed = 0AH

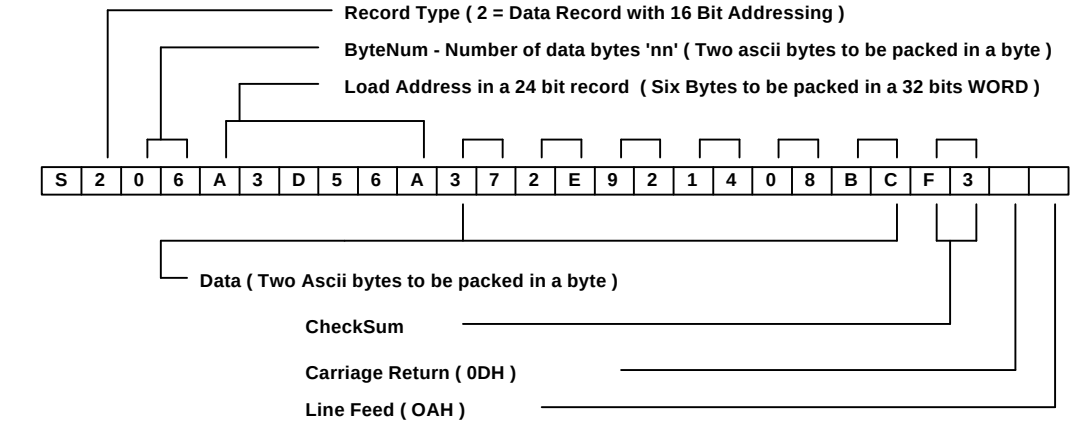
Motorola S FILE EXAMPLE

```
S00600004844521B
S20E01E10053439A000000A80800002F
S20501E1A4452F
S214010000C238A9A8081BF40000F442093B5BA9FF0B
S2140100100A8FF20A00A900008FF40A00A9FF7F8F59
S214010020F60A00A900008FF80A00A20000A0B0019D
S214010030D0038AF00EF8A900889701D0FBC603CA40
S804010000FA
```

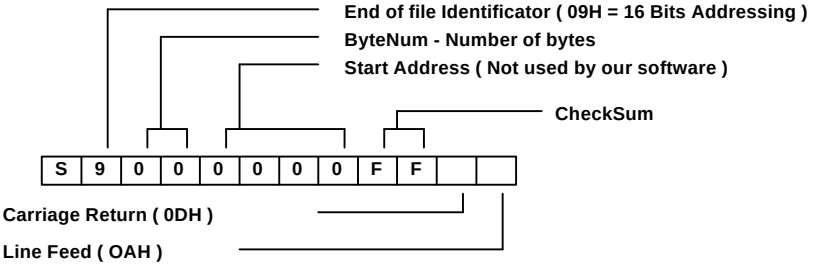
DATA RECORD FORMAT (16 BIT ADDRESSING)



DATA RECORD FORMAT (24 BIT ADDRESSING)



END OF FILE FORMAT (16 BITS ADDRESSING)



END OF FILE FORMAT (24 BITS ADDRESSING)

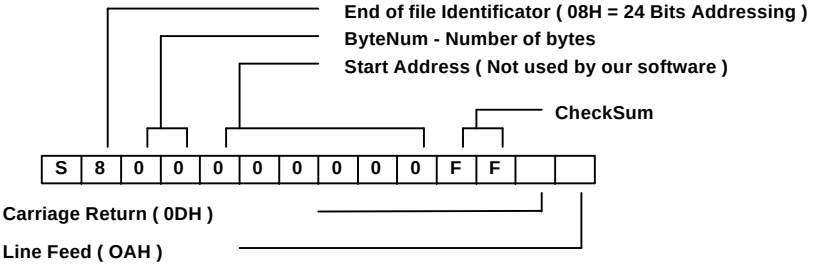
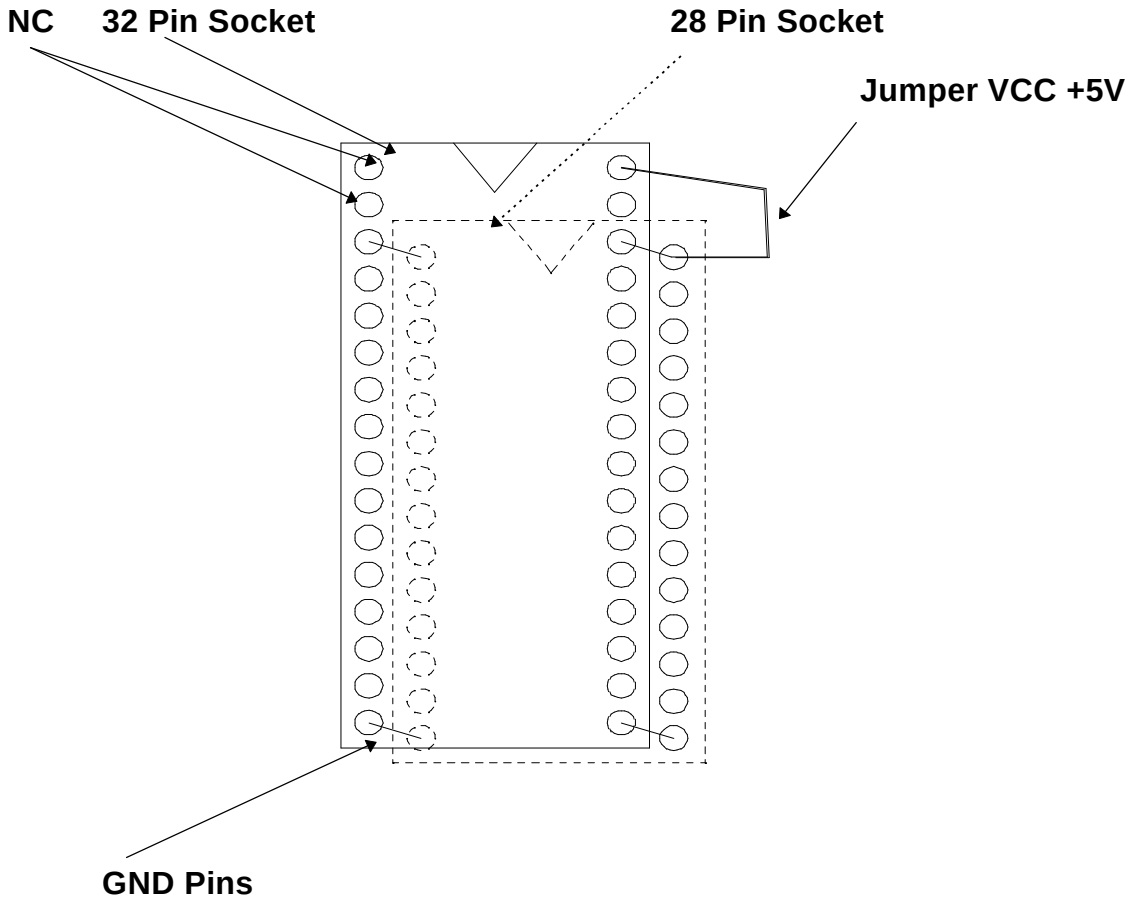


Figure 15- The Motorola SFormat

APPENDIX E
BUILD A 32 PIN - 28 PIN ADAPTER



Building retails

The adapter is formed by a 32 Pin socket and a 28 Pin socket.
The 28 Pin socket must be plugged below the 32 PIN socket with his PIN 14 plugged in the PIN 16 of the 32 PIN socket (EPROM GND). At this point it's sufficent to make a link between the PIN 32 of the 32 PIN socket and the PIN 28 of the other socket (This resolves the power supply connection).
The resulting adapter is now ready to be placed in the POD socket.
For this adapter it is best to use lathed sockets.

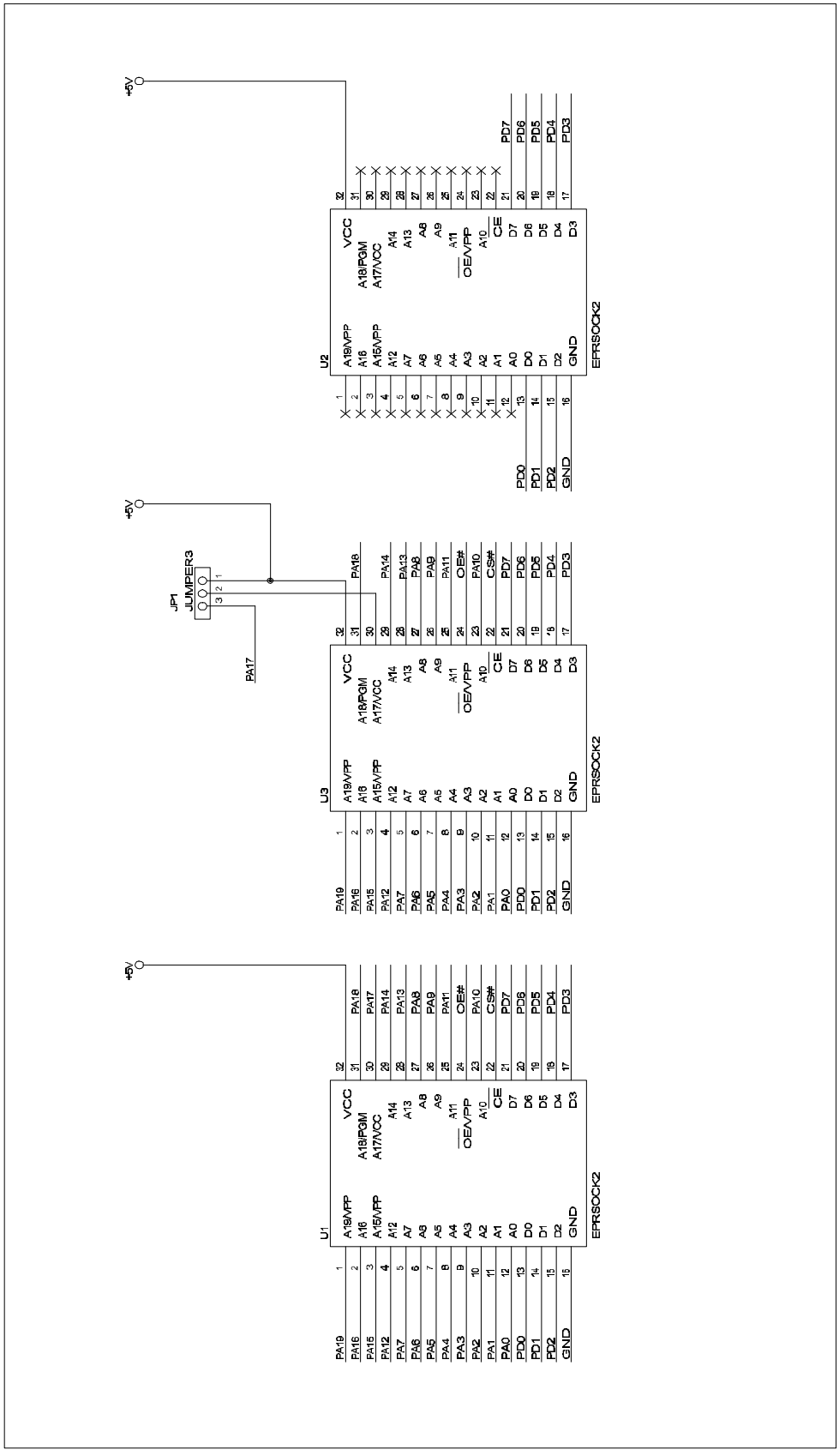


Figure 16 - ADP-LARGE28-32 SCHEMATIC