

MSX Diagnostics

**Test your MSX hardware
in the easiest way!**

MSX

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MSX Diagnostics

User manual

(Version 1.2.0)

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1. Running the software

MSX Diagnostics is available in almost all MSX existing formats, like ROM cartridge, floppy and tape as physical formats, and in several digital formats, enabling people to make their own preferred physical copy or run it in emulators or loading devices, such as flashcards or Gotek devices.

Regardless of the format you choose to run the program, you must hear 3 "beeps" at the same time CAPS led blinks. This indicates that the preliminary hardware check has been successful and the program is starting with normality. The program may take a few seconds to perform this first check and depending on the RAM installed in your system it may take up to 5 seconds. This preliminary test and feedback are also helpful in ensuring that the MSX is booting up even without a monitor connected.



MSX Diagnostics boot screen.

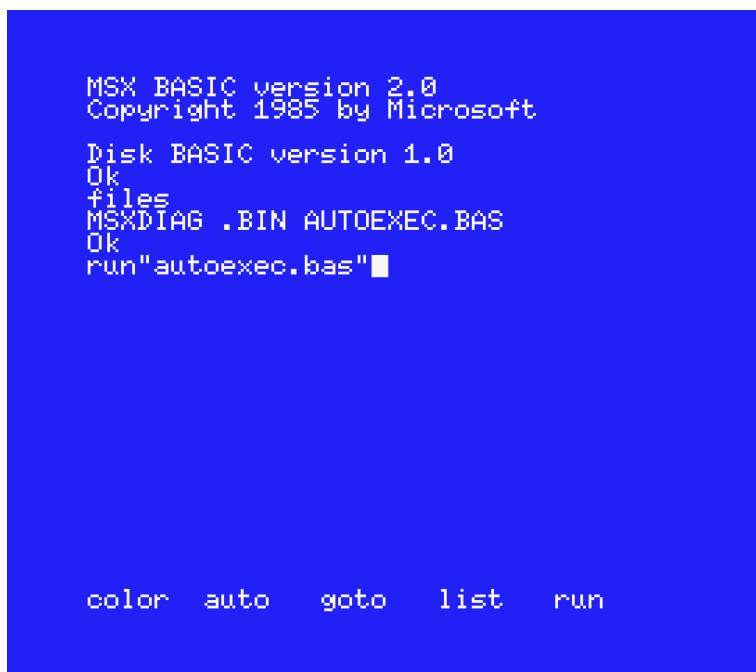
1.1. Running from cartridge

Like all other MSX software in cartridge format, just turn off your computer, insert the cartridge and turn on again. The program will start automatically. Do not remove or insert the cartridge while the computer is turned on.

1.2. Running from floppy disk

To run the program from floppy disk (or from a disk image), insert the disk and turn on the computer. If you put it in the A: drive, it will run **AUTOEXEC.BAS** and start automatically. If you inserted the disk while the computer was turned on, just type **RUN"AUTOEXEC.BAS"** then press **ENTER**.

To run the program from a drive other than A:, just type **BLOAD"B:MSXDIAG.BIN",R** then press **ENTER**. Replace B: for the drive letter where you inserted the disk.



How to load from floppy.

1.3 Running from tape

To run the program from a tape (or tape image) or audio file like WAV, just type **RUN"CAS:"** then press **ENTER**. Press **PLAY** in your cassette player or play the audio file. The **1200 bauds** version will take around **3:53 minutes** to load, and the **2400 bauds** version around **2:10 minutes**.



Floppy/Tape loading screen.

Regardless of the version you are loading, floppy or tape, you will hear 3 "beeps" and see the CAPS led flashing once the program finishes loading.

2. The main menu

After the boot screen, the program will display the main menu. This menu has 2 pages, showing all available tests and options.



These are all the options available.

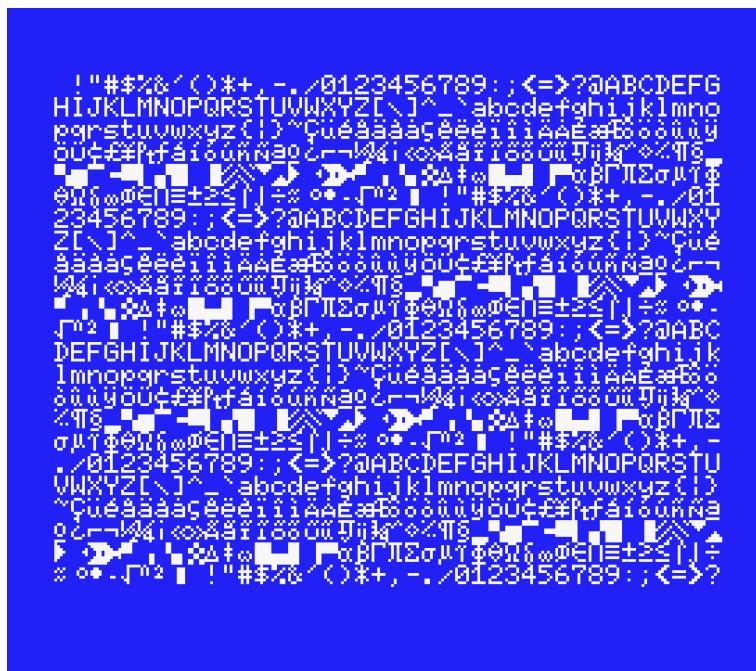
You can move through the options by pressing **UP/DOWN** on the arrow keys or the joystick. To run the selected option, simply press the **SPACE** key or the **joystick* BUTTON 1** (Accept). You can also run a specific option directly by pressing the assigned number key. To change the menu page, use option "0" on both pages or just press **LEFT/RIGHT** on the cursor keys or the joystick. To exit a test or return from an instruction page, press **ESC** key or **BUTTON 2** on the **joystick*** (Cancel).

* Works only with the joystick connected in PORT 1.

3.1. SCREEN 0 test.

This test checks the VDP in the **SCREEN 0** mode. The screen will fill with all printable characters. Check for any corrupted character to make sure the VDP and VRAM work fine in this mode.

By pressing **RIGHT/LEFT** on the arrow keys or the joystick you can change the foreground colour, and by pressing **UP/DOWN** you can change the background colour. Use **SPACE** key or joystick **BUTTON 1** to restore the default colours. Use **ESC** key or joystick **BUTTON 2** to exit the test.

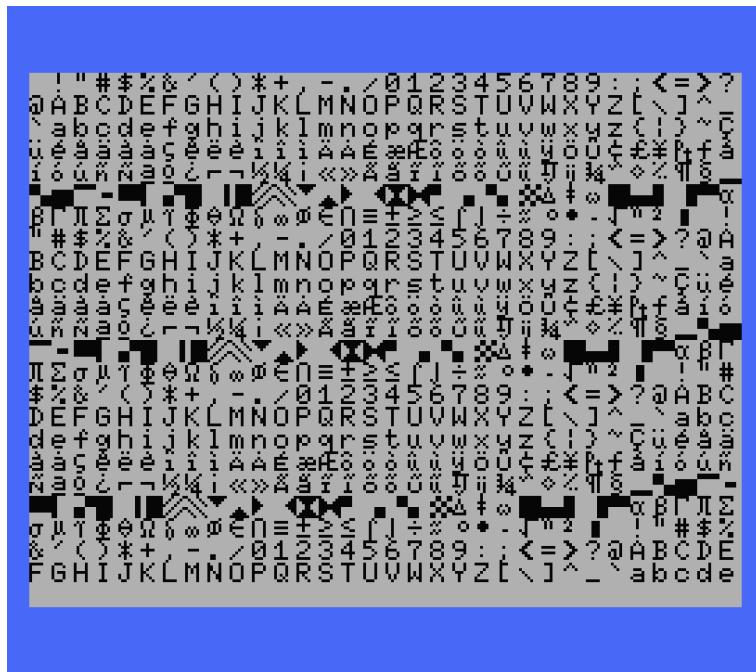


SCREEN 0 test.

3.2. SCREEN 1 test.

This is almost the same test as for SCREEN 0 mode, but for SCREEN 1 mode. The screen will fill with all printable characters. Check for any corrupted character to make sure the VDP and VRAM work fine in this mode.

By pressing **RIGHT/LEFT** on the arrow keys or the joystick you can change the foreground colour, and by pressing **UP/DOWN** you can change the background colour. Use **SPACE** key or joystick **BUTTON 1** to change the border colour. Use **ESC** key or joystick **BUTTON 2** to exit the test.

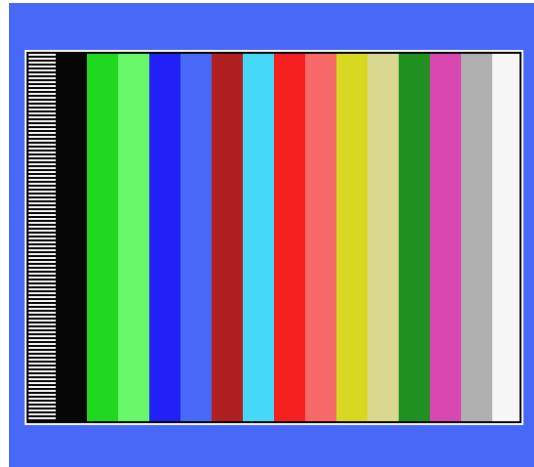
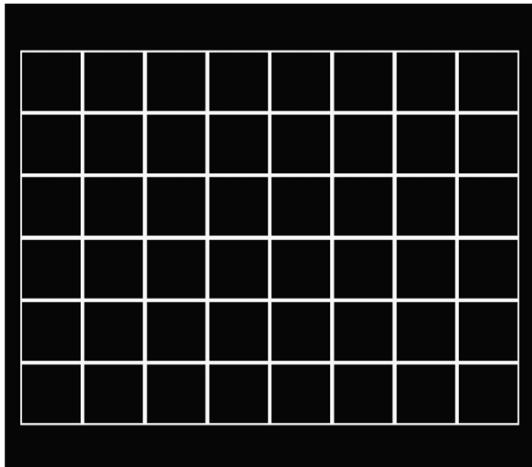


SCREEN 1 test.

3.3. SCREEN 2 test.

Like the previous test, this one will check the VDP in the SCREEN 2 mode. This test will display 4 different images: A pattern with white squares, a pattern with black squares, colours bars and a sample graphic. Check if all images are displayed correctly and without any artefact. You can use the patterns to adjust the geometry of your monitor, centre the screen or adjust the brightness, contrast, etc.

By pressing **RIGHT/LEFT** on the arrow keys or the joystick you can change the image displayed and by pressing **UP/DOWN** you can change the border colour. Use **ESC** key or joystick **BUTTON 2** to exit the test.

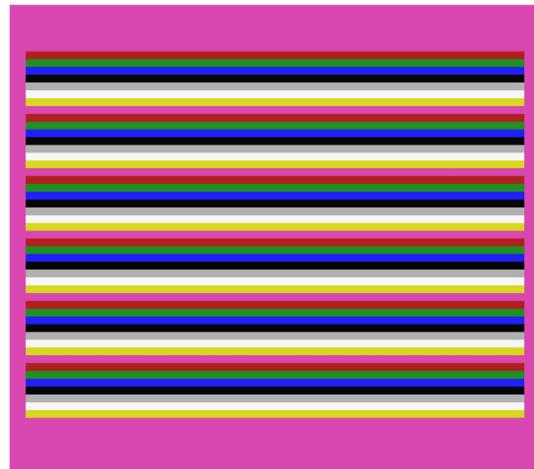
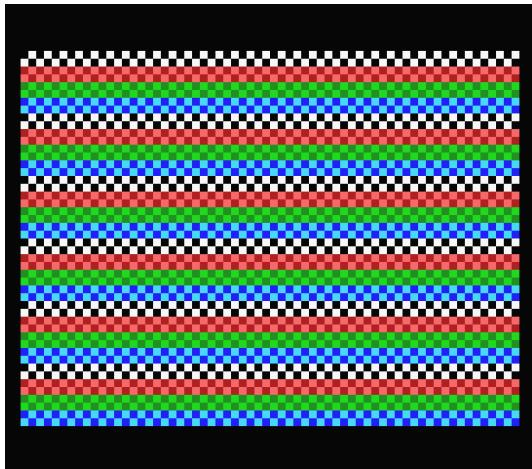


SCREEN 2 test.

3.4. SCREEN 3 test.

This test will check the VDP for the **SCREEN 3** mode and the special features of this mode. This test will display 7 different multi-coloured patterns. Check if every pattern is displayed correctly and without any artefact.

By pressing **RIGHT/LEFT** on the arrow keys or the joystick you can change the pattern displayed and by pressing **UP/DOWN** you can change the border colour. Use **ESC** key or joystick **BUTTON 2** to exit the test.



SCREEN 3 test.

3.5. SPRITES test.

This test puts the screen in mode 2 and shows the 32 available sprites with different attributes, such as colour and position. The sprites use the same shape to make it easy to determine if any of them have a problem.

At the start of the test all sprites will be placed in a grid. Check if all sprites have the same shape and if they are aligned correctly. One of the 15 colours of the MSX1 palette, except black, has been assigned to each sprite on the screen.

Pressing **SPACE** key or joystick **BUTTON 1** will start the sprites bouncing movement. Press again to stop them. You can reset the sprites positions by pressing **UP** on the arrow keys or the joystick. Press **ESC** key or joystick **BUTTON 2** to exit the test.



Sprites test.

3.6. MONITOR COLOR test.

This test fills the screen with a solid colour to check the colour quality or adjust the video output signal. You can choose from **WHITE**, **BLACK**, **RED**, **GREEN** and **BLUE** colours and a **LOOPING** test with the 15 available colours of the MSX1 palette. A text with the colour name will appear briefly when the colour it's selected.

Press **RIGHT/LEFT** on the arrow keys or the joystick to change the colour displayed. In the looping test, press **UP/DOWN** on the arrow keys or the joystick to change the speed. You will hear a "beep" if the speed has changed.

Press **ESC** key or joystick **BUTTON 2** to exit the test.



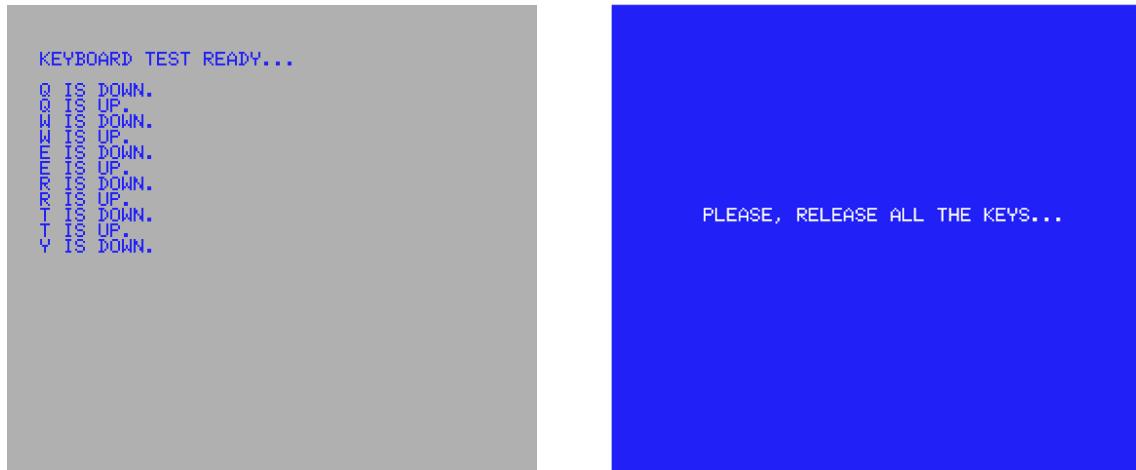
MONITOR COLOR test.

4.1. KEYBOARD test.

This test enables you to check all the keys of the MSX keyboard. Pressing a key will display a confirmation text and the key character (if available), change the foreground and background colour of the screen and make a beep sound. When you release the key, another confirmation text will appear, the screen colours will return to the original ones and another beep sound will be emitted.

The colour change and beep sound allow you to test all the keys without having to look at the screen.

Press "LEFT SHIFT" + "ESC" keys or joystick **BUTTON 2** to exit the test.



KEYBOARD test.

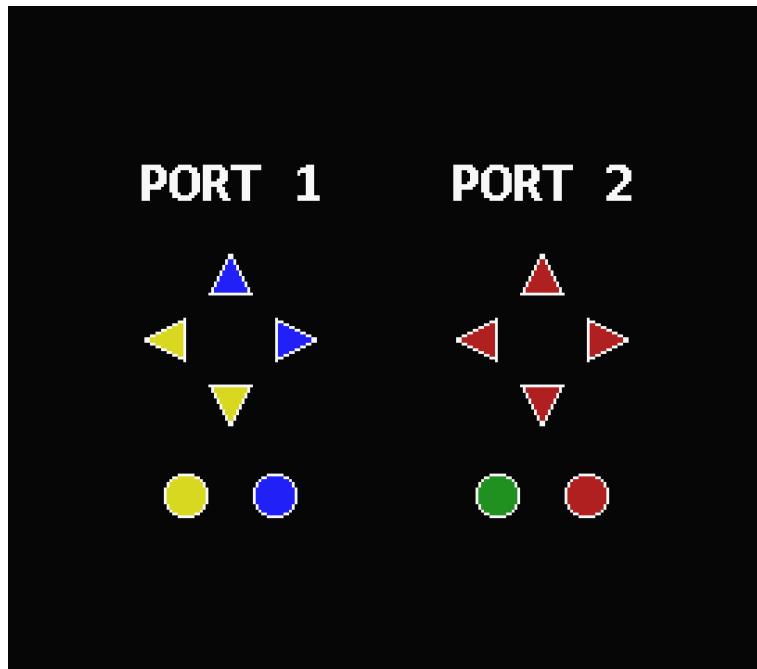
4.2. JOYSTICK test.

You can check any joystick or gamepad connected to both port 1 or 2.

When you move the joystick or the gamepad in any direction or press any button, it will be highlighted in the graphic on the screen, indicating that it works fine. If a specific direction or button is not highlighted it means that the joystick/gamepad has a problem. Please note that this test will also show an error if the port itself has a problem (broken solders, etc.).

Some non-specific MSX joysticks/gamepads (common not at pin 9, GND) will fail the test when pressing BUTTON 2, specially in port 2.

Press **ESC** key or joystick **UP** + **BUTTON 1** to exit the test.



JOYSTICK test.

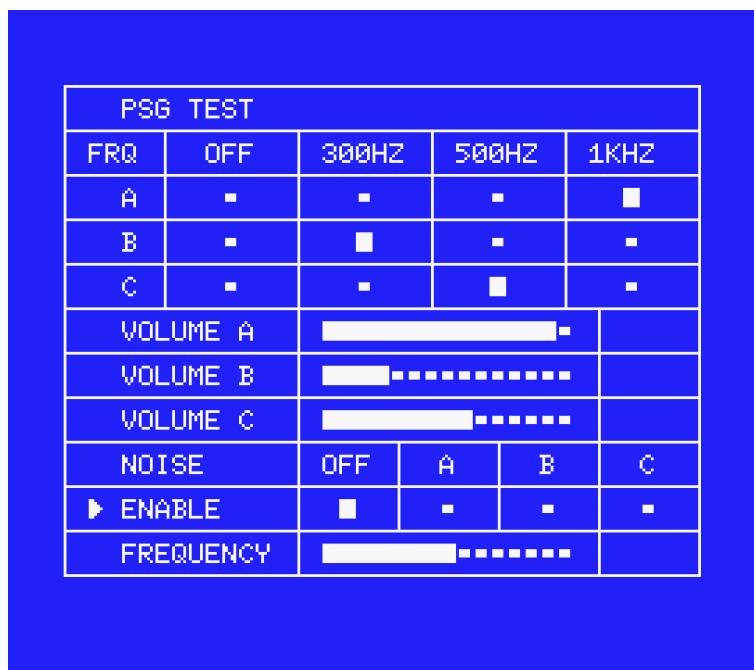
4.3. PSG test.

This is one of the most powerful tests included. With this test you can check in depth the Programmable Sound Generator (PSG) of the MSX.

You can assign to any of the 3 available channels of the PSG a tone with frequencies of 300Hz, 500Hz or 1KHz, change the volume level of each channel or set any channel in noise generation mode, with the possibility of also configuring the frequency of the noise.

Press UP/DOWN on the arrow keys or the joystick to select an option and RIGHT/LEFT to change the value.

Press ESC key or joystick BUTTON 2 to exit the test. Any sound will stop upon exiting the test.



PSG test.

4.4. MIXED MODE test.

This test checks if the VDP of your MSX is fully compatible with the undocumented mode by Texas Instruments.

https://en.wikipedia.org/wiki/Texas_Instruments_TMS9918#Undocumented

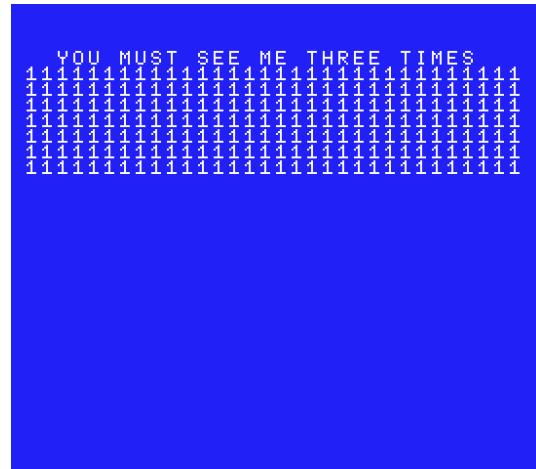
Some MSX models have a "clone" of the official VDP and may not support this undocumented feature. One of the most known models with this issue it's the HX-20 from TOSHIBA.

Just run the test and check if the screen is full of text. If only the upper part fills up, the VDP it's not compatible.

Press **ESC** key or joystick **BUTTON 2** to exit de test.



VDP compatible



VDP not compatible

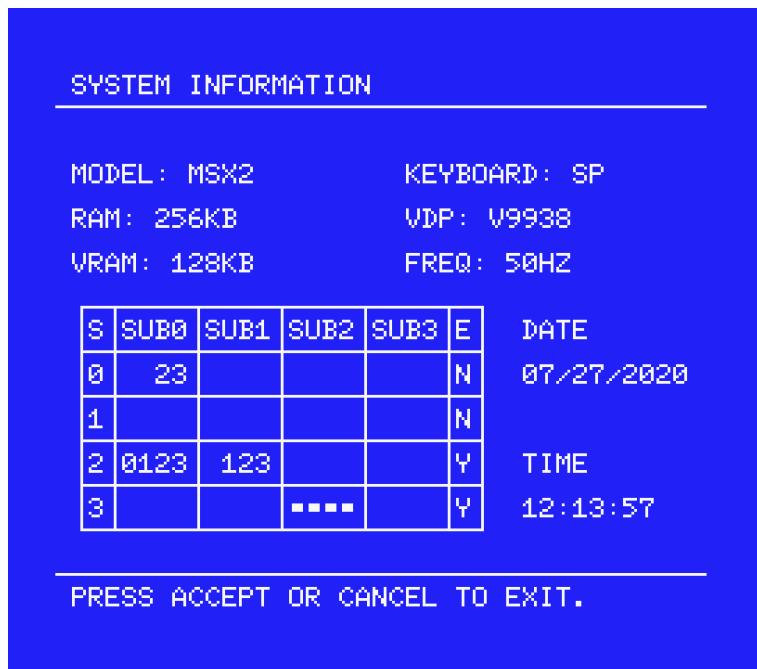
4.5. SYSTEM INFORMATION.

This option generates a report with basic information about your MSX, such the MSX generation, the keyboard language, the amount of RAM and VRAM detected, the VDP installed in your system and the current refresh rate, also indicating with a warning sign if it is not running at the original frequency.

In MSX2 and later models with RTC, it will display the current date & time. If not properly displayed, check if your settings are correct.

This report also shows a table with the current detected RAM layout in SLOTS/SUBSLOTS and if they are expanded or not. It also indicates which page the RAM is placed on (numbers) or if it's MAPPED (squares).

Press SPACE/ESC key or any joystick BUTTON to exit the report.



System information report.

4.6. RAM LAYOUT.

This option generates a more accurate report of the RAM installed and detected in your MSX computer.

This report indicates which slot, sub-slot and page is the RAM placed in and the amount. If the RAM is MAPPED, the report also indicates the number of pages detected.

This report is useful when checking to see if a RAM upgrade is working or if an external RAM expansion is detected.

Press SPACE/ESC key or any joystick BUTTON to exit the report.

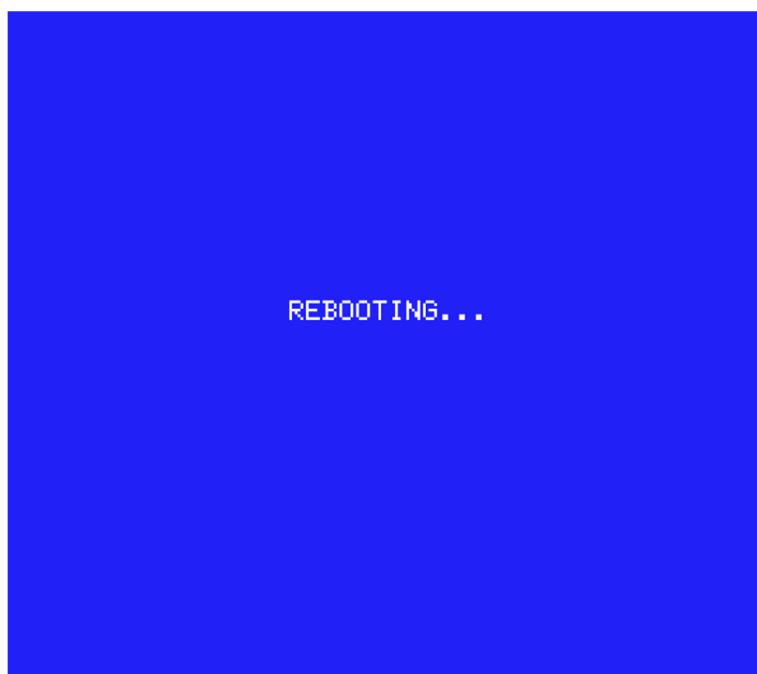
RAM LAYOUT				
SLOT	PAGE 0	PAGE 1	PAGE 2	PAGE 3
0-0			16KB	16KB
0-1				
0-2				
0-3				
1-0				
1-1				
1-2				
1-3				
2-0	16KB	16KB	16KB	16KB
2-1		16KB	8KB	8KB
2-2				
2-3				
3-0				
3-1				
3-2	128KB	MAPPED	IN 8	PAGES
3-3				

PRESS ACCEPT OR CANCEL TO EXIT.

RAM layout report.

4.7. REBOOT.

On both page 1 and page 2 of the main menu, you will find the REBOOT option. When you run this option, your computer will perform a warm reset, erasing the program from the RAM. If you're using the cartridge version, the program will start again automatically.



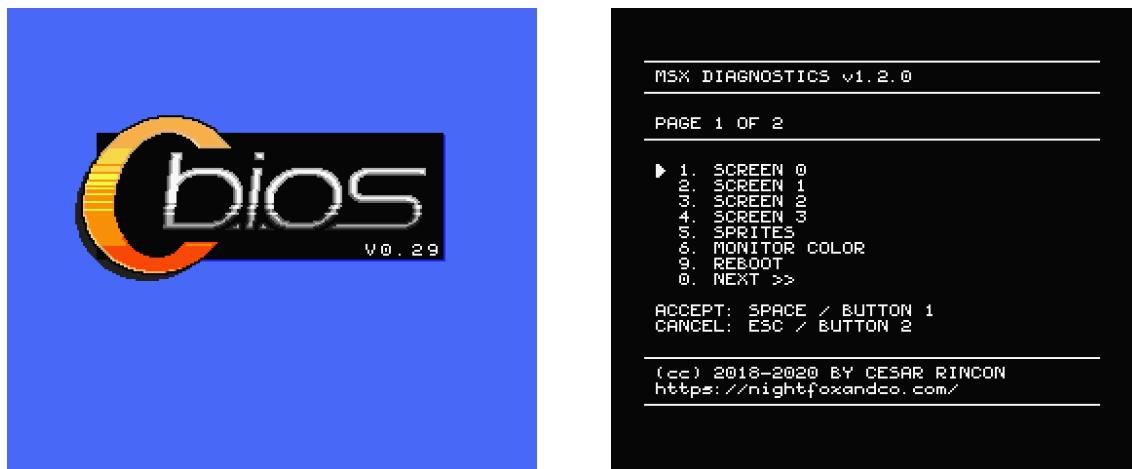
Text at reboot procedure.

5. Known issues.

As of the publication date of this manual, one of the known issues of MSX Diagnostics is a minor incompatibility with systems using C-BIOS.

These systems will not correctly display the background colour in some tests and menus, which makes the MONITOR COLOR test useless.

The rest of the tests works as expected and no other issues are known at this time with C-BIOS.



Known issues using MSX Diagnostics with C-BIOS systems.

Some users using ROM loader devices, such as Carnivore2 with ROM loading software, have reported that the ROM version does not boot correctly on those devices. This is not an issue of MSX Diagnostics itself. In such cases, try running the DISK version of the program.

Text revised and corrected by Aura Rincon

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Compatible with

MSX

MSX₂

MSX₂₊

MSX turbo R

Minimum system requirements
32KB RAM / 16KB VRAM