MSX AUDIO BIOS & SAMPLE RAM EXPANDER KIT FOR PHILIPS MUSIC MODULE

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MSX Audio Bios & Sample RAM Expander KIT

For Philips Music Module

At first, thanks for purchase the Music Module Expander KIT! This is a DIY (do it yourself) KIT that upgrade the Philips Music Module's sample RAM from 32Kb to 256Kb and implement a BIOS with the original commands for MSX AUDIO and other features. The original project was done by FRS and MSXPro, for more detailed information you may find here: http://www.msxpro.com/hardware/mm_upgrade/msxaudio-BIOS-EN.txt

Before install your upgrade KIT, take in mind that I'm not responsible for any possible damage in your equipment, so **please do it at your own risk**. If you are not very sure to do, try to contacting a trusted electronic technician.

Your KIT comes with the following new components:

- 1x Printed Circuit Board

- 1x 64Kb EPROM BIOS V1.3   (CI1)

- 1x 8Kb SRAM D4364C or compatible   (CI2)

- 1x TTL IC 74139   (CI3)

- 2x DRAM 256*4bits   (CI4 / CI5)

- 1x 100nF ceramic capacitor   (C1)

- 1x 47uF eletrolitic capacitor   (C2)

- 2x 28pin sockets

- 1x 16pin socket

- 28x pins bar   (CN1)

- 1x 16pin dual side socket   (CN2)

- 1x connector 4pins male   (CN3)

- 1x 4color cable wire with female connector

- 1x wire for jumper

For assemble and install your Music Module upgrade kit you will need basically a soldering iron, welding sucker, weld, cutter pliers, and a screwdriver to open your cartridge.
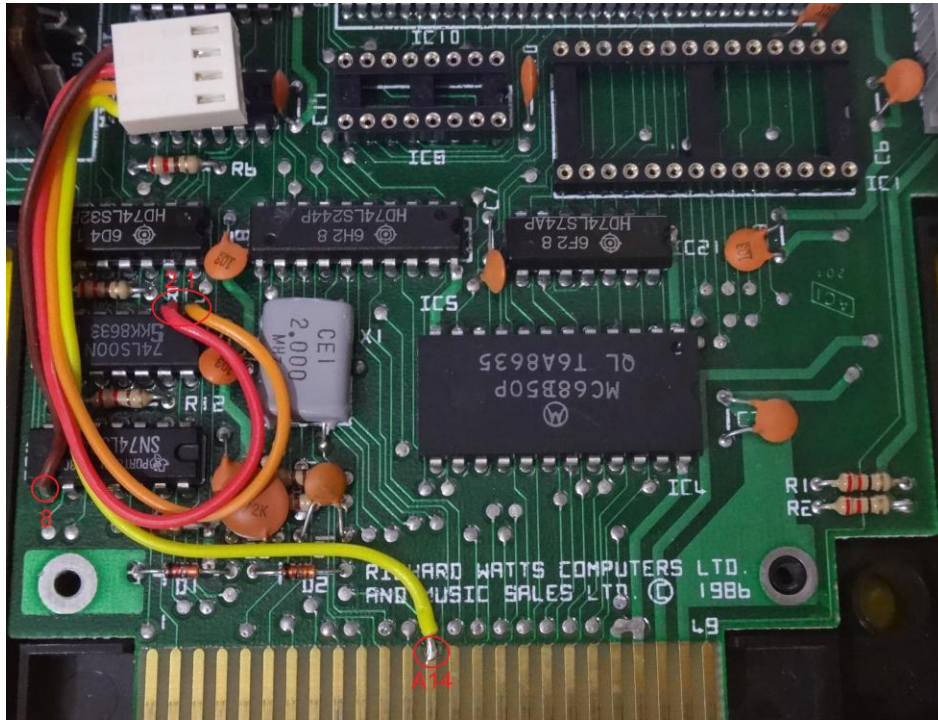
- **Step 1 -** Preparing the Music Module

Open your Philips Music Module and detaching its Printed Circuit Board. Locate the IC1 (EPROM 27256) and the IC8 (memory 41256). Desolde these ICs (or the old socket) and place one of new socket 28 pin for IC1 and 16 pin for IC8 as show at the picture below.

Now in back side of PCB make a jumper wire from pin 9 of IC2 (7404) to pin 36 of IC10 (Y8950) as show at the picture below. Take care for soldering the wire to Y8950 since the pins are closer than others.
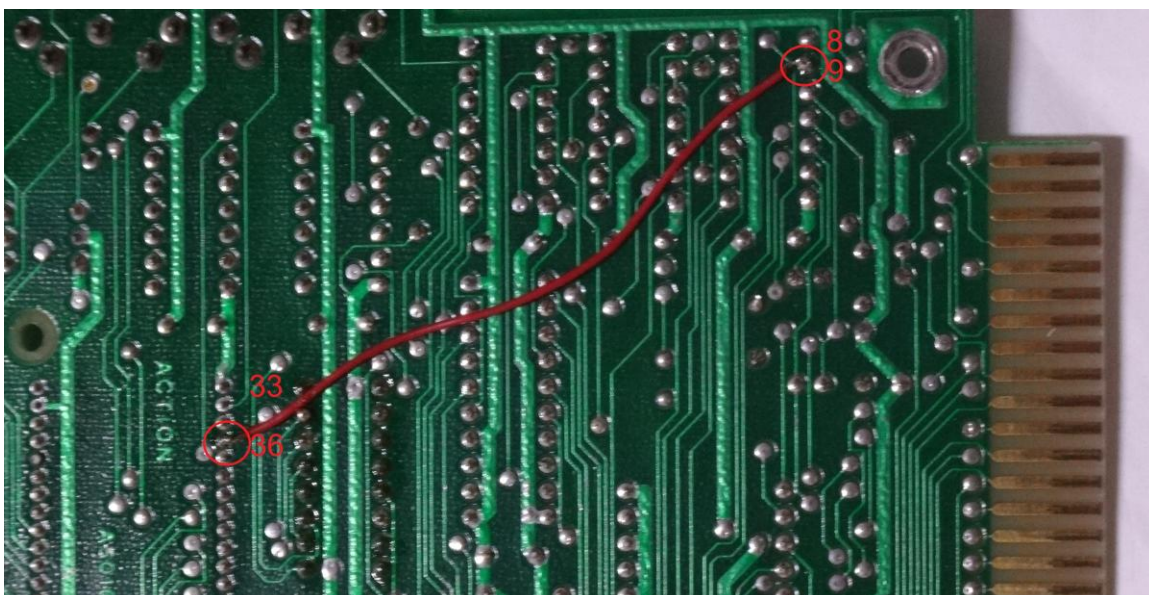
Take the color cable with connector and solder the **brown** wire to pin 8 of IC2 (7404), the **red** wire to pin 2 of IC3 (7400), the **orange** wire to pin 1 of IC3 and the **yellow** wire to A14 signal as show at the follow picture.


- **Step 2 -** Preparing the upgrade board

Before soldering the 28 pin socket for EPROM, you must soldering the bars for piggyback. At this step, a tip is connect the bars (the thin pin side) to IC1 and IC8 sockets at Music Module and then place the PCB kit to take a better alignment for soldering. After soldering the pins bars and before soldering the 28 pin socket, cut-off the exceed of pins as pictured. Take care with those pins bars, they are fragile and may break easy. Anyway I have sent one or two pins for replacement if necessary.
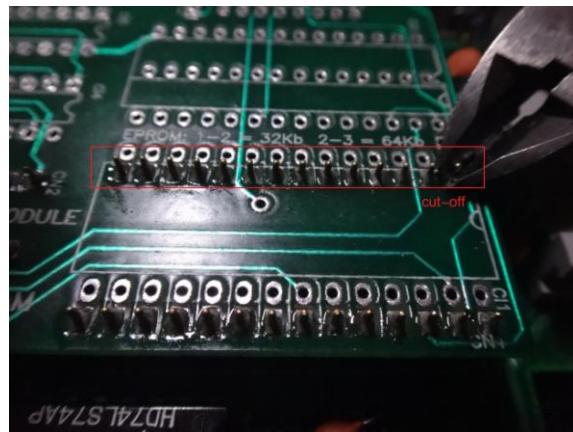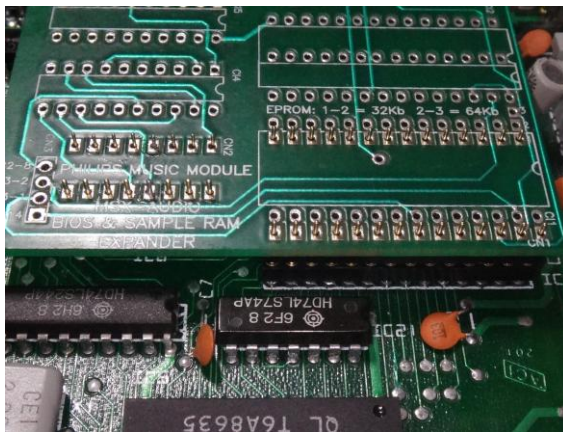
Now populate the PCB as indicated by picture, soldering all components.

Since this latest BIOS version 1.3 is 48Kb size and use a 64Kb EPROM, please make a jump to pins 2-3 for two positions as indicated at pictures. It is a BIOS only, there is no original Philips Music software.
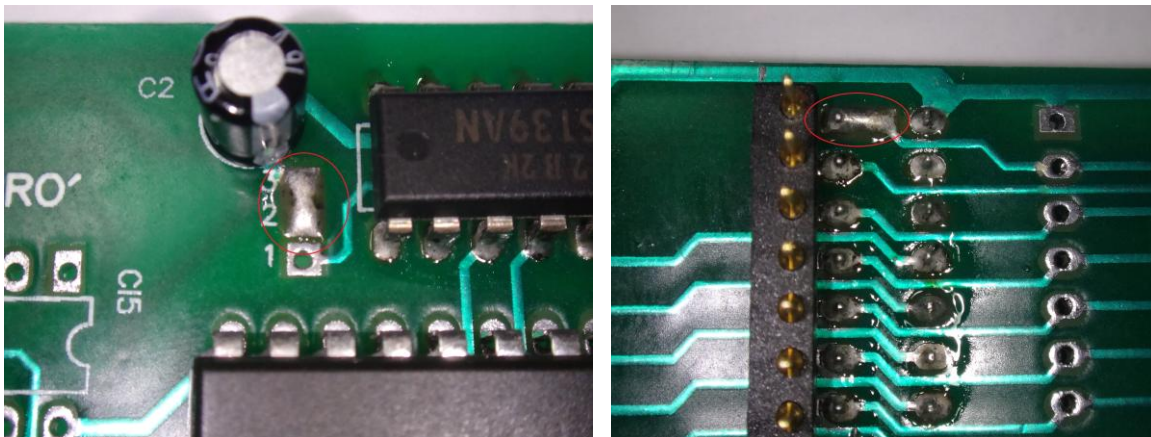
After soldering all components, place the EPROM and connect the 4pin color cable to PCB kit and check all before use. If you get a black screen, turn off immediately and check all connections, mainly if the A14 signal is not short circuited with another point.

For tests you may try to use in BASIC the command "CALL AUDIO". For more specific tests you may run the "Xevious" game, it will access the MSX Audio sound direct with no any extra poke command. For memory test you may run the "Unknown Reality" demo to see at the sample memory count 256Kbytes.

If those tests are ok, so congratulations, your expansion KIT for Music Module was successfully installed!

Enjoy it! For any questions feel free to contact me at fractal2000@gmail.com