

Toshiba HX-MU900 Music Module Expander

256 kB Sample RAM, MSX-Audio Basic and original rom

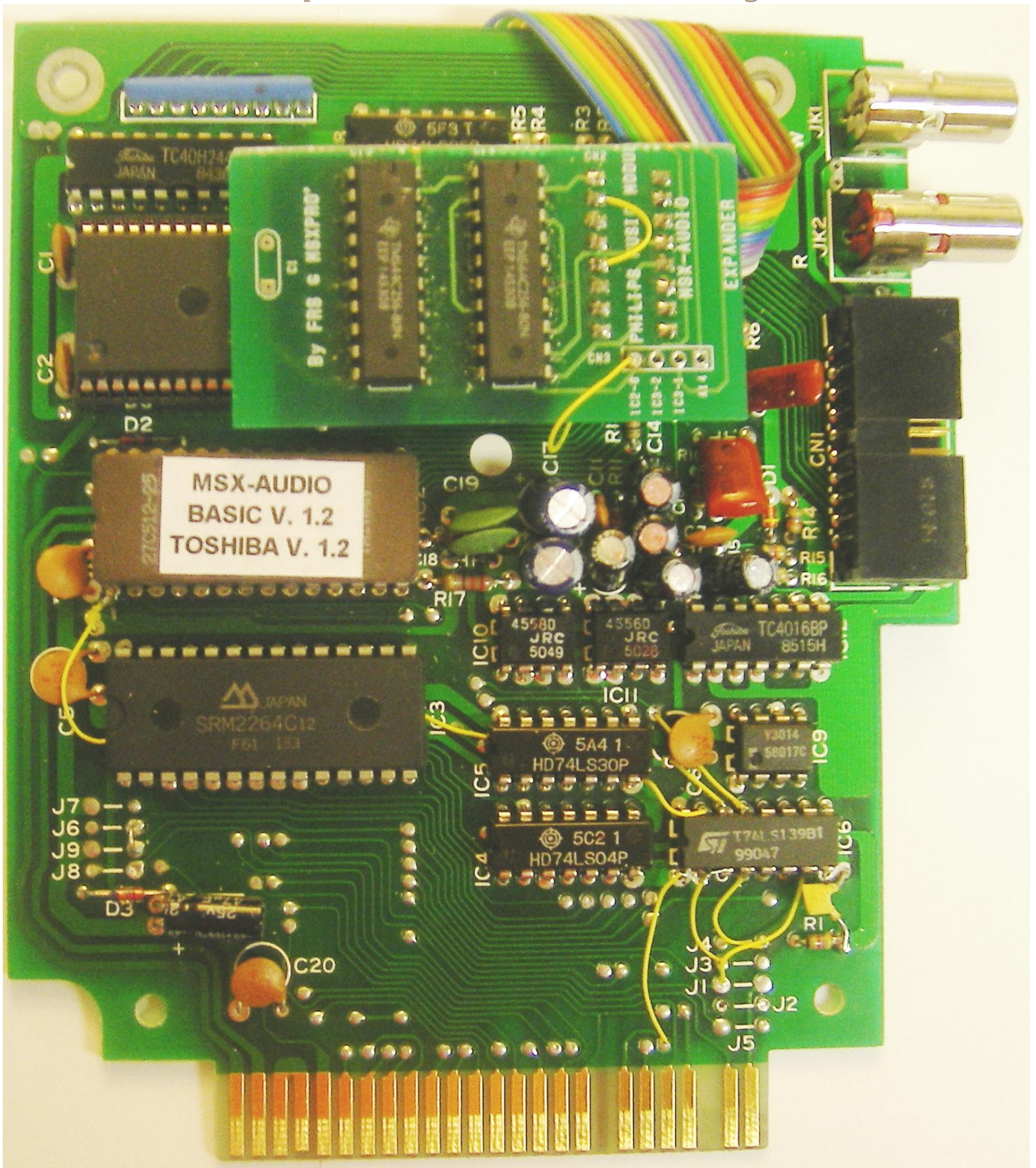


Table of Contents

- Background 3
- About this document..... 3
- After the upgrade 3
- The package consists of the following components..... 4
- Preparation..... 4
- Top circuit board mounting 4
- Mounting bottom circuit board..... 5
- Mounting expander PCB with 256 kB Sample Ram 5
- Create the following connections to the bottom of the printed circuit board..... 5

Background

Back in 2005 Brazilian MSX users Fábio Ricardo Schmidlin (FRS) and Luciano Sturaro (MSXPró) released an expander PCB for the Philips Music Module. This board came with an adjusted Panasonic MSX Audio ROM and with 256KB sample memory. A while ago FRS published his schematics so other MSX users could recreate his upgrade PCB. Because nobody took this challenge while there was still demand SuperSoniqs jumped in. It took us some months to gather all the necessary parts, order the PCB's and then find a partner to assemble the upgrade boards. After some setbacks we finally succeeded. The Toshiba Music Module expander is based on a modified Philips Expander. We would like to thank FRS and MSXPró for their great work. They can be reached through www.MSXpro.com. Please check our site for news and information about our products. Our place on the web can be found at supersoniqs.com. We hope you have great fun with this upgrade!

About this document

This document describes how to mount the recreated MSX Audio Extension Expander for the Toshiba HX-MU900 Music Module Expander. This manual assumes that you have extensive skills when it comes to handling and soldering electronic parts. If you don't know how to solder electronics or you are not sure about your skills, please contact Bas Kornalijnslijper (www.bas-ditta.info) to do the upgrade for you, or find someone in your network that can. SuperSoniqs cannot be held responsible for damage to your Toshiba Music Module when you do the upgrade yourself. Also keep in mind that the Toshiba Music Module is a 25 year old device and making adjustments to such old electronics need the greatest care possible.

After the upgrade

When you insert the Music Module in your MSX, holding <ESC> key during boot will start the internal Toshiba software. Pressing <TAB> will disable the MSX Audio Basic ROM. For normal operation no keys have to be pressed.

Warning: The most important part in the Toshiba Music Module is the circuit board. Parts can be replaced, however the circuit board can not. Do not try to desolder the parts, but just cut them loose and remove the remaining PINS.

The package consists of the following components

- Complete pre-assembled expander PCB with 256 kB Sample Ram
- Eprom with MSX-Audio Basic and custom original software
- SRAM memory chip (SRM2264C)
- 74LS139 2 resistors of 1K Ω
- Capacitor of 47 μ F
- Capacitor of 0,1 μ F
- Wiring

Preparation

- Remove IC2 (Eprom in IC-socket)
- Remove the solderdrops on empty spots of IC3 at the circuit board.
- Remove the solderdrops on empty spots of IC6 at the circuit board
- Remove the solderdrops on empty spots of C21 at the circuit board
- Remove wire bridge J2
- Remove wire bridge J8

Top circuit board mounting

- New Eprom, trim (shorten) pin 1
- Place the new Eprom with the remaining pins in the empty I.C. Socket (IC2)
- Place the SRAM memory chip (SRM2264C) in the empty place of IC3
- IC374LS139, trim pin number 1, 2, 3, 13, 14 and 15
- Place the 74LS139 with the remaining pins in the empty place of IC6
- Place the capacitor of 47 μ F in the empty place of C21
- Solder the capacitor of 0,1 μ F between IC6 (74LS139) pin 8 and the right side of R1
- Create a connection between the right side of J6 and the right side of J9
- Create a connection between IC6 (74LS139) pin 1 and the slotconnector pin 14
- Create a connection between IC6 (74LS139) pin 2, IC6 (74LS139) pin 3 and the left side of J3
- Create a connection between IC6 (74LS139) pin 4 and the right side of J4
- Create a connection between IC6 (74LS139) pin 7 and the left side of J1
- Create a connection between IC6 (74LS139) pin 13 and IC3 (SRM2264C) pin 26
- Create a connection between IC6 (74LS139) pin 14 and IC3 's pin 2 (SRM2264C)
- Create a connection between IC6 (74LS139) pin 15 and IC2 (Eprom) pin 1 and IC1 (Y8950) pin 9
- Create a connection between the right side of J7 and IC1 (Y8950) pin 26

Mounting bottom circuit board

- Create a connection between IC8 (74LS05) pin 3 and IC1 (Y8950) pin 36
- Solder a resistor of 1K Ω between IC 1 (Y8950) pin 9 and GND of C1 or C2
- Solder a resistor of 1K Ω between IC8 (74LS05) pin 4 and IC8 (74LS05) pin 14

Mounting expander PCB with 256 kB Sample Ram

- The print has sticky tape on one side and needs to be placed on IC1 (Y8950). The ribbon cable is on the right side and fits exactly between the resistors
- Cut the ribbon cable of sufficient length, then all colored leads can be stripped and get a little soldering at the end of the wire. The white lead is not used.
- The outer brown lead is lead 1 and the outer purple lead is lead 17

Create the following connections to the bottom of the printed circuit board

- • - Green (1)- lead 4 - IC1 (Y8950) pin 29
- • - Blue (1)- lead 5 - IC1 (Y8950) pin 30
- • - Brown (1)- lead 1 - IC1 (Y8950) pin 32
- • - Yellow (1)- lead 4 - IC1 (Y8950) pin 37
- • - Purple (1)- lead 7 - IC1 (Y8950) pin 38
- • - Orange (1)- lead 3 - IC1 (Y8950) pin 39
- • - Gray - lead 8 - IC1 (Y8950) pin 41
- • - Black - lead 10 - IC1 (Y8950) pin 42
- • - Red (2)- lead 12 - IC1 (Y8950) pin 43
- • - Yellow (2)- lead 14 - IC1 (Y8950) pin 44
- • - Blue (2)- lead 16 - IC1 (Y8950) pin 45
- • - Orange (2)- lead 13 - IC1 (Y8950) pin 46
- • - Brown (2) - lead 11 - IC1 (Y8950) pin 47
- • - Purple (2)- lead 17 - IC8 (74LS05) pin 4
- • - Red (1)- lead 2- - IC8 (74LS05) pin 7
- • - Green (2)- lead 15 - IC8 (74LS05) pin 14