musitronics - SY99 Sample RAM-Expansion

Operating and installation manual:

1. About this manual:

Thank you for purchasing the SY99 Sample RAM Expansion which gives you the most flexibility in expanding SY99 internal Sample RAM.

Installation Components:

- SY99 RAM Expansion Board
- 8 Pin Wire
- Mounting Material
- This Manual

If you want to have more than 3 MB Sample Ram in your SY99:

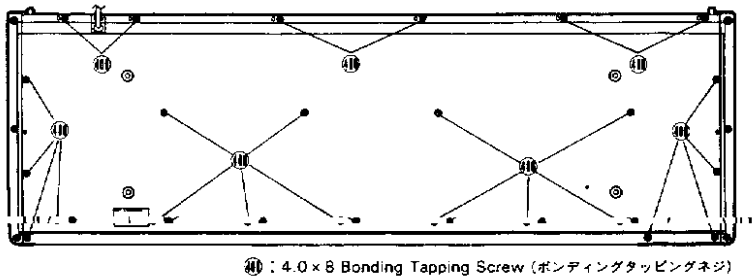
- Upgrade Operating System Version 1.57.EX

It is only possible to Upgrade to the 8MBVersion if you have the latest Operating System Version 1.57, if not please contact us.

You need the following tools and aids for the installation: A cross-head screwdriver, an electronic solder-iron, fine solder.
The installation should be done in a dry and clean room. Please keep in mind that there are delicate components inside your SY99 that might be destroyed by electronic discharge. Ground yourself before installing the board by touching a metal object that is grounded itself.

2. Installation of the SY99 RAM Expansion :

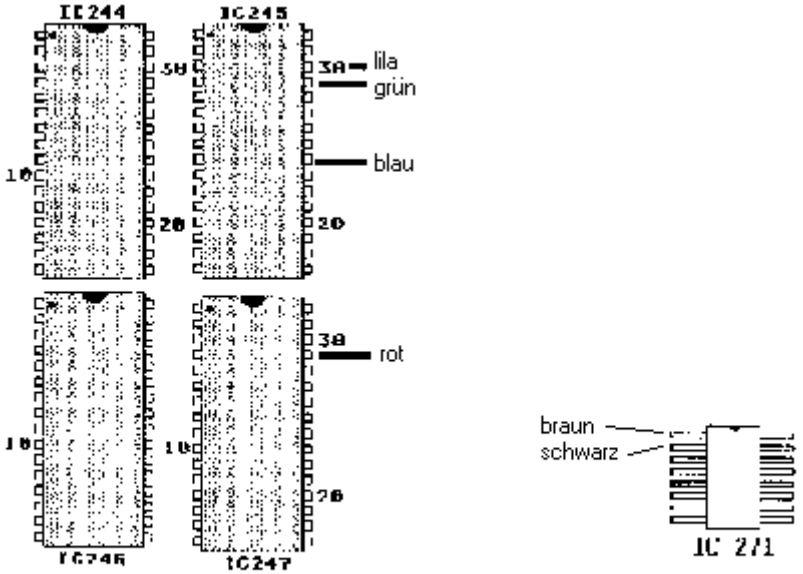
a.) Remove the mains plug from the mains, and also all other connection leads from the SY99. Lay the SY99 on its front (on a soft surface, naturally).
b.) Loosen the 24 screws on the back like the picture describes and lift the casing off.



On the component side you will see 2 green boards. The DM-1 board and the DM-2 board. The DM1 Board controls the switches the keys and the display, the DM2 Board is for the sound synthesis of your keyboard. On the right side (all is described that you see the SY99 from the front side) there is a 40 pin grew flat cable which goes to connector 208, it is responsible for the data and address lines of the PCM waveform memory. Here the **musitronics** SY99 will be connected between. But first you have to solder the control lines.
The control lines has different colours and functions:

Wire 1	(purple)	Reset	on Pin 30 of IC 245
Wire 2	(blue)	Output Enable	on Pin 24 of IC 245
Wire 3	(green)	MSB Write	on Pin 29 of IC 245
Wire 4	(yellow)	Battery Voltage	Optional on R337-R341
Wire 5	Not used		
Wire 6	(red)	LSB Write	on Pin 29 of IC 247
Wire 7	(brown)	Address 20	on Pin 1 of IC 271
Wire 8	(black)	Address 21	on Pin 1 of IC 271

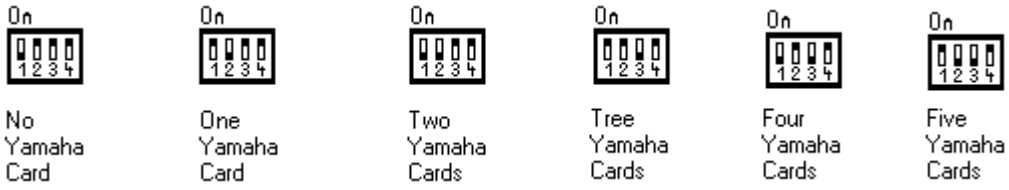
The Group of IC 244,245,246,247 is the internal RAM waveform memory. Here solder 4 wires like described on the picture below:
IC 271 is located downwards it is a small SMD Chip here you have to solder the two wires very carefully, don't make any contact between an pins of IC 271.



If you have soldered all control wires, now you can insert the **Sample RAM-EX** Board. First remove the 40 pin flat cable of connector 208 and loosen the screw on the corner near of the flat cable. Now insert the **Sample RAM-EX** board carefully on the main board and put the plastic holder between the two boards. Fasten the expansion board with the supplied screw.
Finally put the 40pin grew flat cable on the **Sample RAM-EX** board, and the connector with the control wires too.

3. Adjust the memory configuration:

On our **Sample RAM-EX** board there is a 4 pole dip switch. Here you must adjust the position of the switches if you have some memory expansions in one or more of the 5 memory slots:



Put the switches in the right positions like the picture above demonstrates.

4. Checking the Battery Voltage of the Sample Ram-EX board:

If you not have Yamaha Cards in all five Slots you can use the battery voltage check of the slots to check the battery off the **Sample RAM-EX**. It's optional you needn't to do it, but than you have to ignore the message: „WARNING: Change Wave bat"
If you don't want to use the battery check, just cut the yellow cable behind its connector. Otherwise solder the yellow cable to the 220K resistors (colour-code red red yellow) at the corner near the hole for the screw like shown in the schematics underneath:

5. Change the Operating System EPROM:

If you want to have more than 3MB internal sampling RAM space you have to change the operating system. First Check your Software Version. You can display the software Version if you press simultaneously the VOICE and then the INTERNAL and then the 1 switch below the INTERNAL switch. If you do not have Version 1.5X you also have to exchange the Main CPU because Some software code is on that chip. (see point 6.)
In the right upper corner of the DM1 board the 3 operating system EPROMS are placed in 32pin IC-Sockets. The lower one is the MAIN ROM it is IC 111. Replace IC 111 with the delivered 32-Pin EPROM 1.57-EX. Make sure of the IC polarity).

6. Replacing the Main CPU (if you not have Version 1.5X):

Important: To do this point is only necessary if you not have the latest Version 1.5X.
First replace IC113 like described in point 5. After that you have to exchange the Main CPU
The main CPU is inserted in a 84 pin PLCC Socket in the right upper corner. It is IC no 128. (This is written on the upper side).
Touch carefully with the supplied tool the corners of the CPU and take it out. If you insert the new CPU it is very very important that you put it in the right way. There is a point on the CPU which marks pin number 1. In the near of Pin on there is a quartz and an arrow.
On of the side of the chip is a little bit slope and also on of the side in the socket. Naturally put this sides together. If the chip is in its right position press carefully on it to insert the main CPU.

7. Test Run of the SY99 Sample RAM Expansion:

First you have to initialise the SY99 Sample RAM Expansion: After you switch on your SY99 press the „UTILITY“ switch. Now go to the „SYSTEM UTILITY“ menu and select „MEMORY ALLOCATE“ .
Press INIT and confirm the „Are you sure ?“ message with „YES !“ After some seconds „COMPLETED“ should be written on the display and the memory space is shown. All Sample Ram memory will be erased if you init the Sample Ram, so if you have some important data save it first. The following table shows the values that the „ALL MEMORY“ parameter displays:

0.5 MB	→ 512K
1 MB	→ 1024K
1.5 MB	→ 1536K
2 MB	→ 2048K
2.5 MB	→ 2560K
3.0 MB	→ 3072K
3.5 MB	→ 3584K
4.0 MB	→ 4096K
4.5 MB	→ 4608K
5.0 MB	→ 5120K
5.5 MB	→ 5632K
6.0 MB	→ 6144K
6.5 MB	→ 6656K
7.0 MB	→ 7168K
7.5 MB	→ 7680K
8.0 MB	→ 8192K