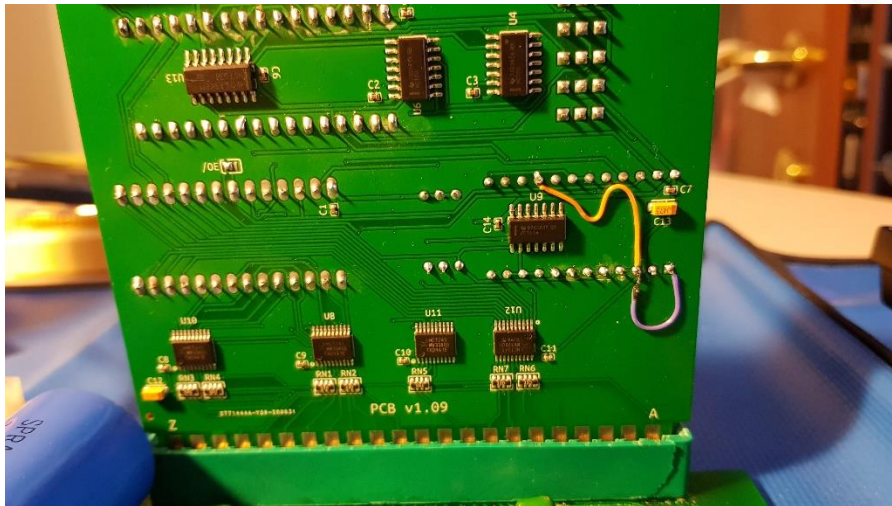


# APPLE-1 JUKE-BOX RAM SUBSTITUTION

v1.09

Your *Apple-1 Juke-Box* can temporarily replace some or all of the RAM on your computer, whether Original or Replica, with small, simple modifications.



This feature can be useful in case of testing, failure or unavailability of components.

*The operations described below should be considered temporary and at your own risk.*

It is mandatory to put in place all the safety procedures against the accumulation of electrostatic charges already described in the main manual.

Apple-1 can have up to 8 kBytes of RAM on the mainboard. They are organised in two 4 kBytes "banks" with eight chips each, for a total of sixteen chips.

According to the "with ACI" configuration described in the Computer Operating Manual, and indicated in the main manual of the Apple-1 Juke-Box, they are divided as follows:

- Bank "O", addresses from 0x0000 to 0x0FFF, 8 chips from position B11 to B18.
- Bank "E", addresses from 0xE000 to 0xEFFF, 8 chips from position A11 to A18.

Follow the instructions in section 1 and 2 (or both, if necessary), depending on the bank you wish to replace.

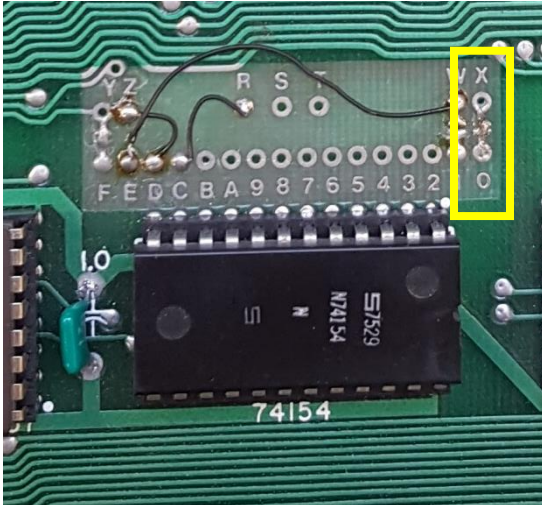
## WARNING

To avoid short circuits and damages to all components: **NEVER** use a modified *Apple-1 Juke-Box* on a motherboard which has not been set up as explained in the following sections.

## 1. Substitution of memory bank "0" (addresses from 0x0000 to 0x0FFF)

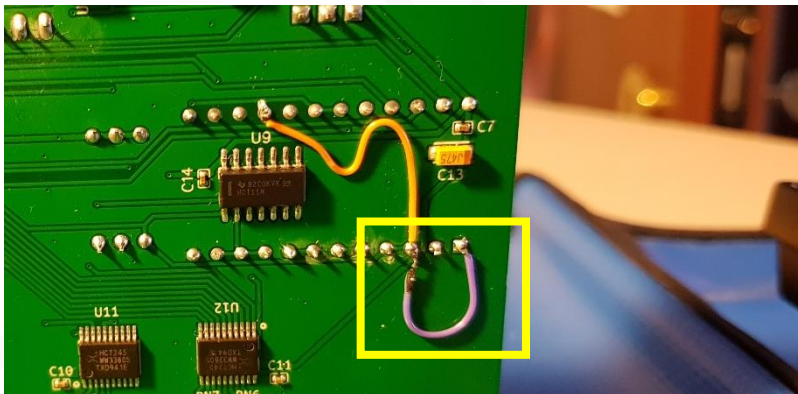
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- 1.1 Open/desolder the connection between the pad "X" and pad "0", as shown in the picture:



There must be no electrical connection between the two pads.

- 1.2 Remove all eight memory chips from position B11 to position B18.
- 1.3 On *Apple-1 Juke-Box* solder a small wire as shown in the yellow box in the picture:



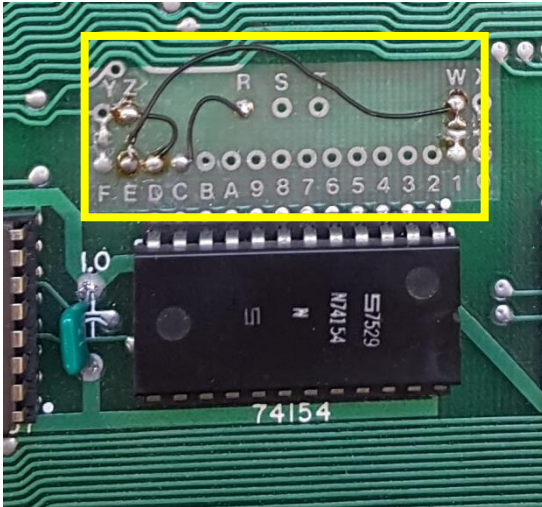
Pin 1 and 3 of Integrated Circuit 74159 must be connected together, like the purple wire in the figure aside.

- 1.4 Switch on the computer and operate normally.

At the end of the test/troubleshoot/etc. restore the original connections, put the memory chips back in place and remove the temporary connection on the *Apple-1 Juke-Box*.

## 2. Substitution of memory bank "E" (addresses from 0xE000 to 0xEFFF)

- 2.1 Open/desolder the connection between the pad "W" and "E" as shown in the picture:



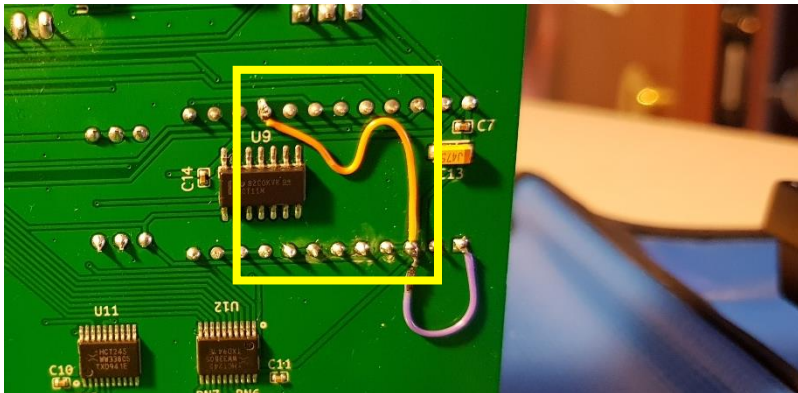
Usually the connection is made by a small wire.

Desolder the wire on the "W" side.

Insulate the freshly desoldered end of the wire to ensure that it does not make accidental contact with other components.

- 2.2 Remove all eight memory chips from position A11 to position A18.

- 2.3 On Apple-1 Juke-Box solder a small wire as shown in the yellow box of the picture:



Pins 16 e 3 of Integrated Circuit 74159 must be connected together, like the orange wire in the figure aside.

- 2.4 Switch on the computer and operate normally.

### PLEASE NOTE.

*In this configuration the memory segment from 0x6000 to 0x6FFF will not be usable. In "RAM 32kB" configuration, therefore, the maximum contiguous memory size will be limited to 24 kBytes (addresses from 0x0000 to 0x5FFF) instead of 32 kBytes. The "RAM 16kB" configuration, instead, will operate normally.*

At the end of the test/troubleshoot/etc. restore the original connections, put the memory chips back in place and remove the temporary connection on the Apple-1 Juke-Box.

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