838-384K MODULE

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838-384k Module

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Version History / Revision

Version	Release Date	Updates
1.0	April 13, 2021	Initial Release

Introduction

The 838-384k Memory Module allows for an easy installation of an additional 384k to the Myarc Geneve 9640 computer without having to worry about piggy-backing SRAM's.

Requirements

- Myarc Geneve 9640
- Soldering iron and solder
- Wire Wrap Solid Kynar Wire 30 Gauge (6 colors will do)
    - Different colors make it easier to identify which goes where!
        - Red, black, blue, yellow, green, white
- De-soldering tool to remove filled solder 'vias' in order to route wires. I recommend a vacuum solder station.
    - This allows for better wire management.
- You will be required to cut one trace on you Geneve!

Disclaimer

I, Chris Schneider will **NOT** be responsible for any damages to your Geneve or any other system device, nor will I be responsible for any stress related issues caused by this procedure.

If you are unsure if you have the ability to do this then please err on the side of caution and contact someone that can.

Preperation

This installation will be from the concept of a standard Geneve 9640 from the factory or an upgraded Geneve with the 32k SRAM modification.

If your Geneve already has the 384k piggy back type upgrade then I suggest locating and purchasing a new sound chip, SN76496 (U14) if you do not want to unsolder everything.

Please be careful! Given the age of our Geneve 9640 computer cards they can tend to become very fragile over the years.

Let's do some preparation first. You will need to cut some wires if they were not already provided.

- 8 wire-wrap wires
    - Cut 1x red, 1x white, 1x green and 1x blue to 10 inches (we will trim later)
    - Cut 1x black, 1x green, 1x yellow to 3 inches
    - Cut 1x black to 5 inches

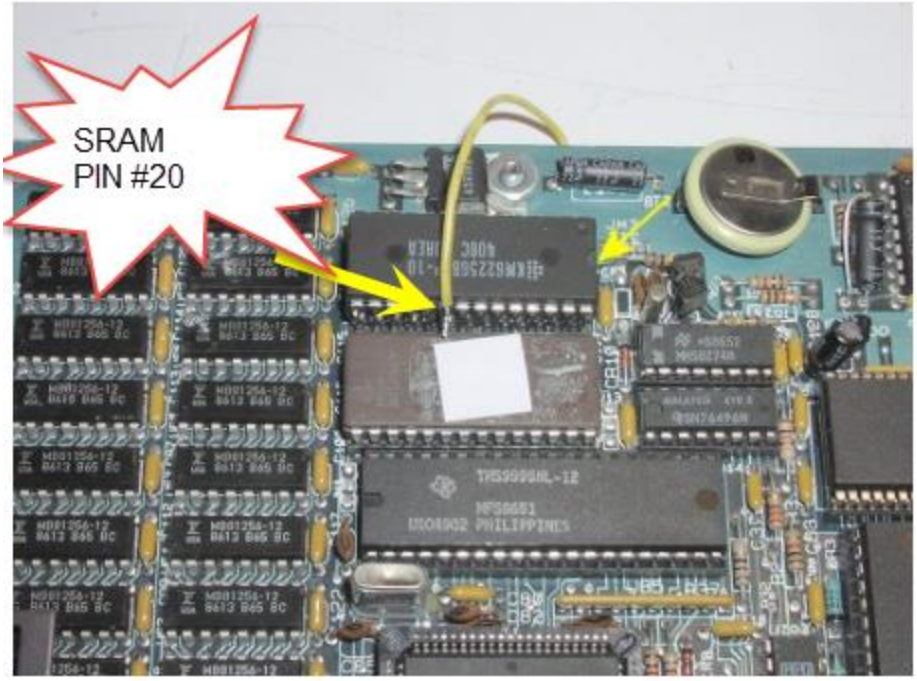
Now let's start.

Take a deep breath and say to yourself… "I can do this!"

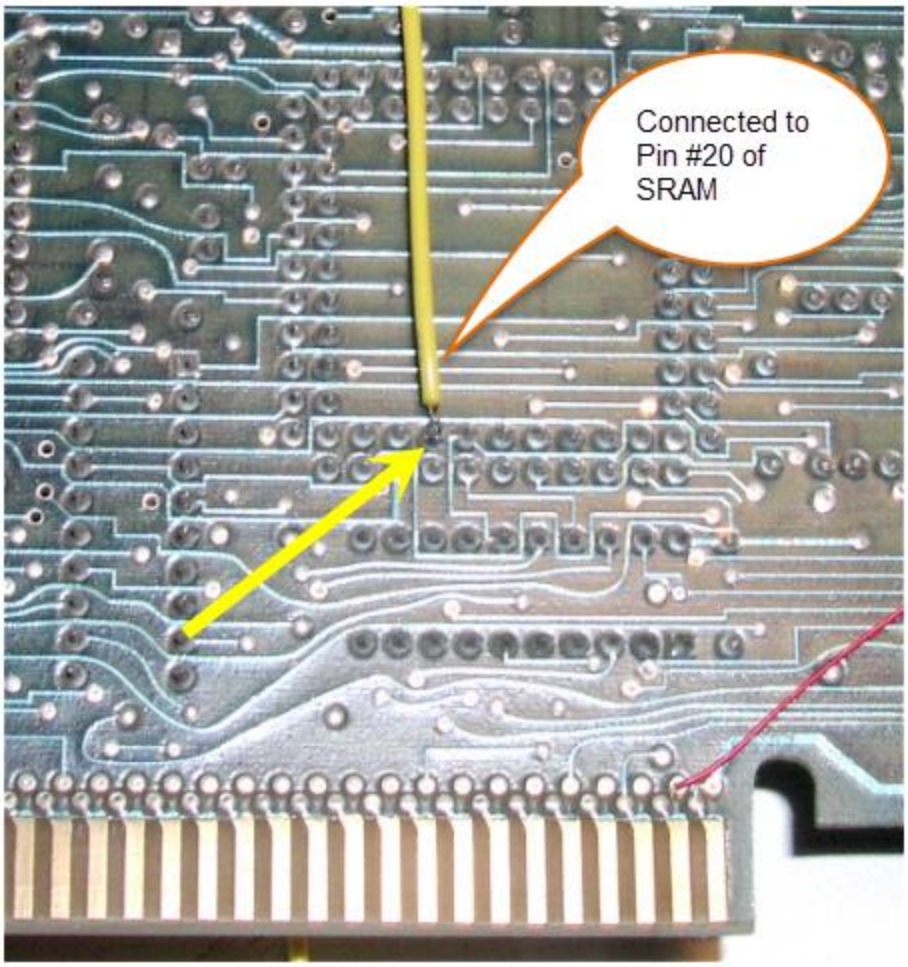
1. If your Geneve is in a PEB Card housing, carefully remove it and place on a static free surface.
2. Remove the lithium cell CR2032 battery.
3. If your Geneve already has a 32k SRAM modification continue below. If your Geneve is standard (no 32k SRAM modification then skip to step #3):

   Take some photos of your current installation for reference if you have to back out your modification.

   a. Turn Geneve over and place on a static free area
   b. Find the wire that runs from pin #20 of the current 32k SRAM to the Gate Array.



i. Unsolder the wire from the Gate Array



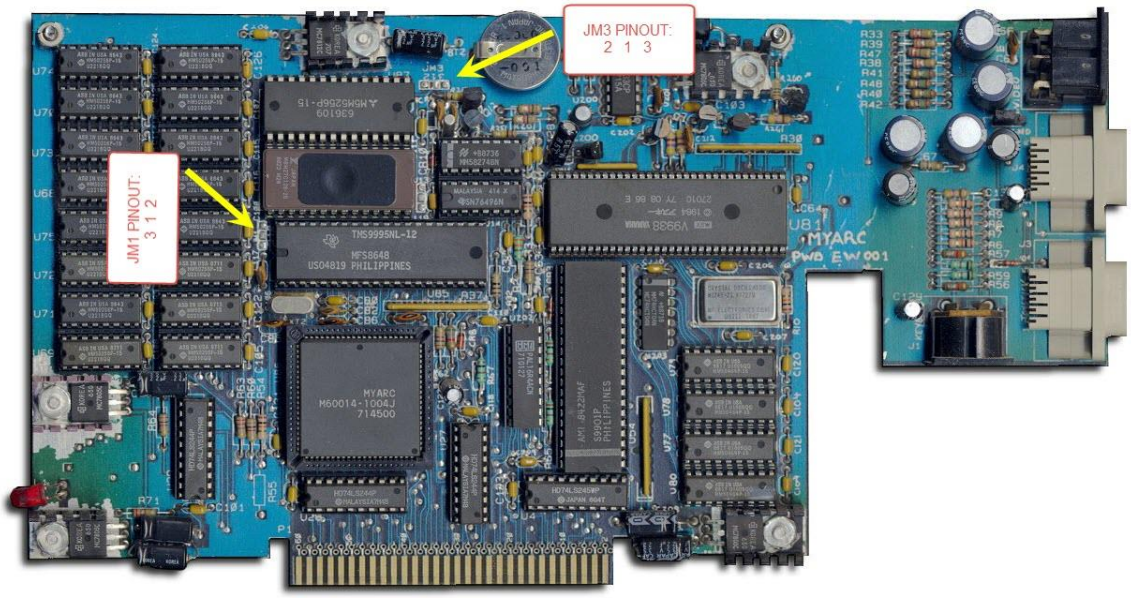
4. Remove the current SRAM from its socket but be careful not to break any pins or scrape the PCB under the SRAM.

Time to do some prepping!

Wire Management Prep

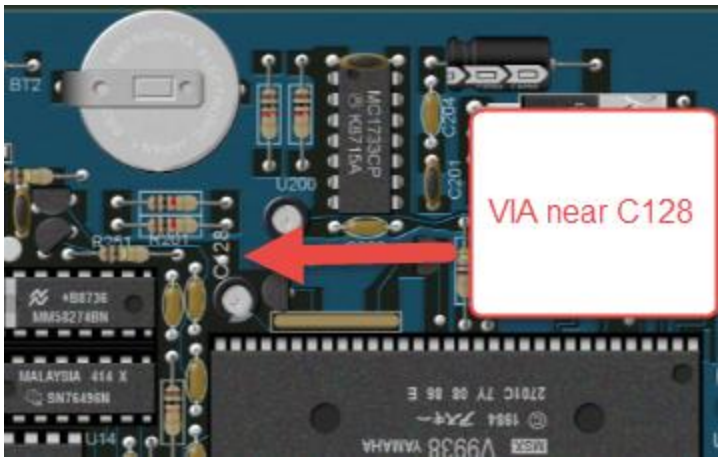
Locate JM1 and JM3 locations as well as the via near C128.

JM1 is located to the left of the TMS9995 IC and JM3 to the right of the SRAM. The via near C128 is above the V9938 IC.


JM3 PINOUT:
2 1 3
JM1 PINOUT:
3 1 2
TMS9995NL-12
MFS8648
US04819 PHILIPPINES
MYARC
M60014-1004J
714500
MYARC
PWB EW001

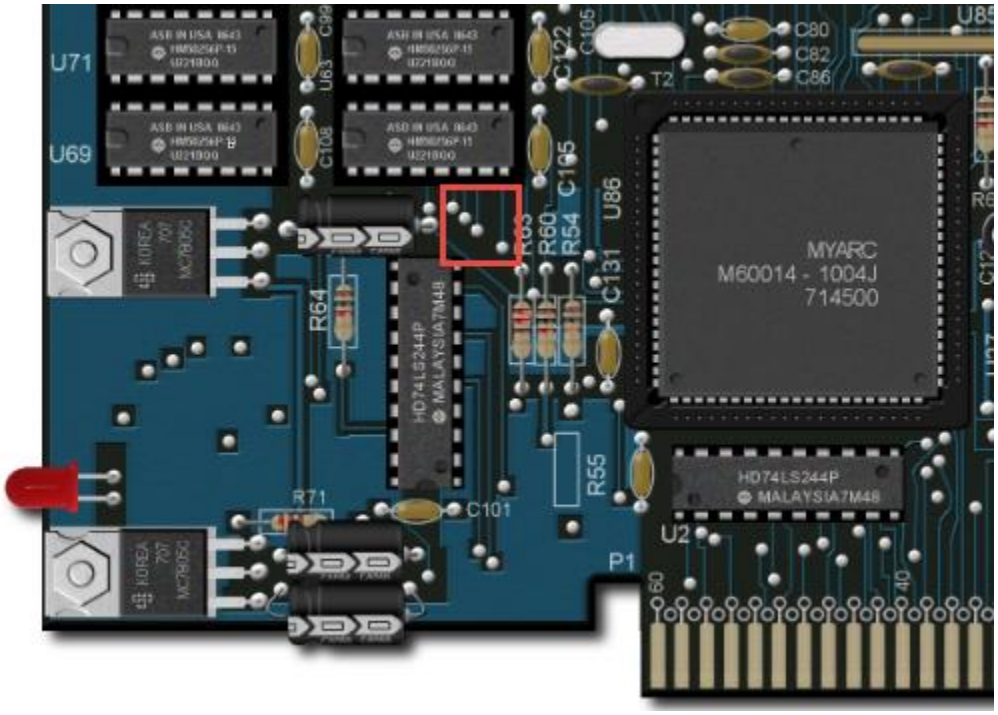
JM1 PINOUT:
3 1 2
TMS9995NL-12
MFS8648
US04819 PHILIPPINES

JM3 PINOUT:
2 1 3



Using your soldering vacuum station to remove the solder from JM1 PIN #3, JM3 PIN #2, #3 and the via near C128 as shown in the above photos.

Next there are 4 vias near the GATE ARRAY that need to be vacuumed out so we can route 4 wires there as well.



PCB Connections

PINOUT:

1	2
3	4
5	6
7	8

Figure 1

- Pin #1 = To U29 LS244 Pin #13 (BLUE)
- Pin #2 = To U29 LS244 Pin #15 (GREEN)
- Pin #3 = To JM1 Pin #3 (BLACK)
- Pin #4 = To JM3 Pin #3 (BLACK)
- Pin #5 = To JM3 Pin #2 (GREEN)
- Pin #6 = To Gate Array Pin #42 (RED)
- Pin #7 = To Gate Array Pin #39 (WHITE)
- Pin #8 = To Through Hole above C128 (YELLOW)

Now that we have all the vias vacuumed out let's start.

I suggest inserting the wires through the bottom of the board and solder on the top. This will allow you to cut the wires to length. I typically leave about 2 inches of slack for the long wires that will connect to the LS244 and the Gate Array. Leaving one inch of slack for the wires that will connect to the other locations.

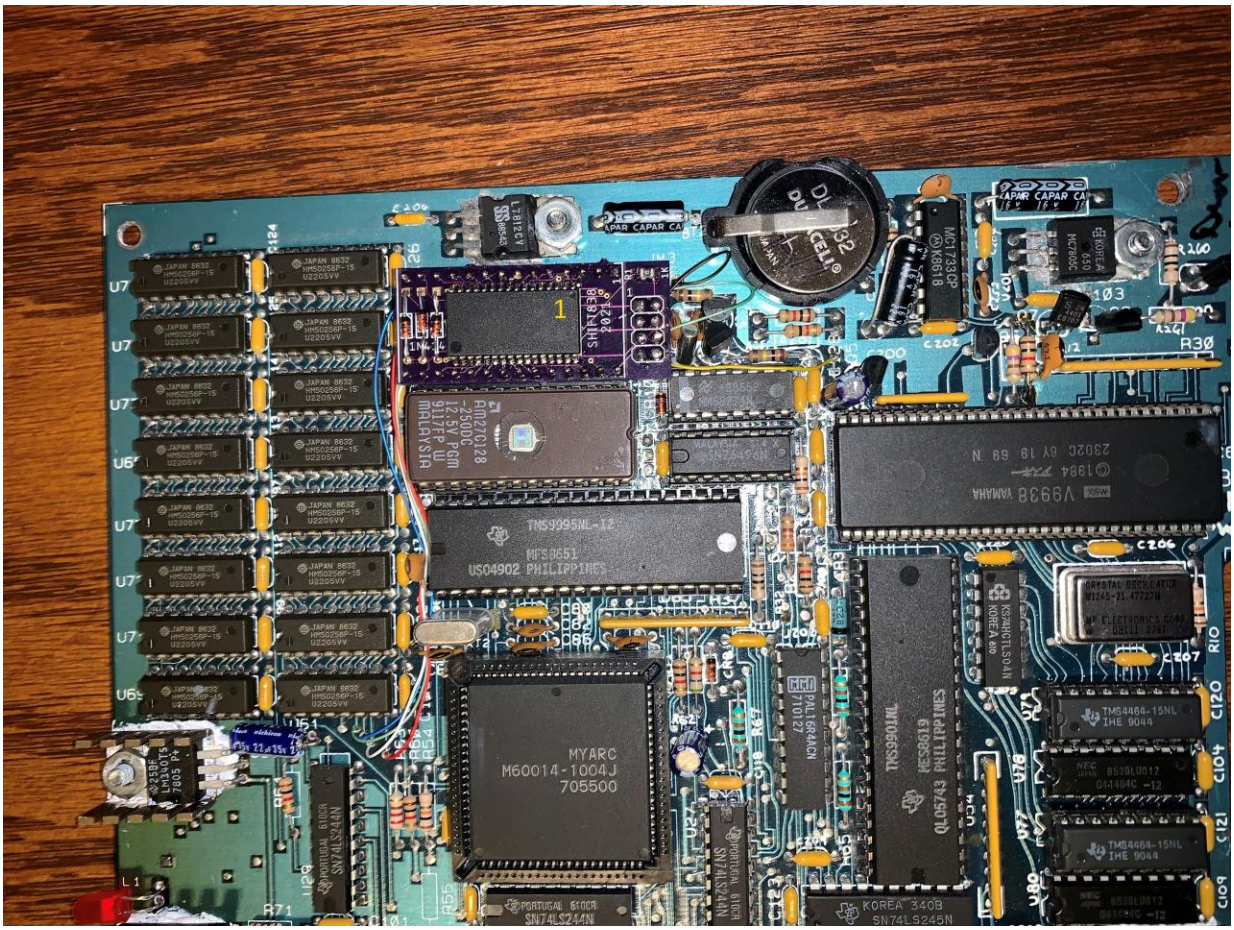
DO NOT cut the wires until you are ready to solder them to ensure proper length.

5. Strip one end of your wires to remove about 1/8 inch of insulation. I suggest to solder the wires by inserting them from the bottom of the module. This is so that we can route the wires under the module for cleaner wire management.
    a. Take the 10" BLUE wire and solder it to PIN #1 of the 838-384KM module. See Figure 1 for pinout configuration.
    b. Take the 10" GREEN wire and solder it to PIN #2 of the 838-384KM module
    c. Take the 5" BLACK wire and solder it to PIN #3 of the 838-384KM module
    d. Take the other BLACK wire and solder it to PIN #4 of the 838-384KM module
    e. Take the 3" GREEN wire and solder it to PIN #5 of the 838-384KM module
    f. Take the 10" RED wire and solder it to PIN #6 of the 838-384KM module
    g. Take the 10" WHITE wire and solder it to PIN #7 of the 838-384KM module
    h. Take the YELLOW wire and solder it to PIN #8 OF THE 838-384KM module.

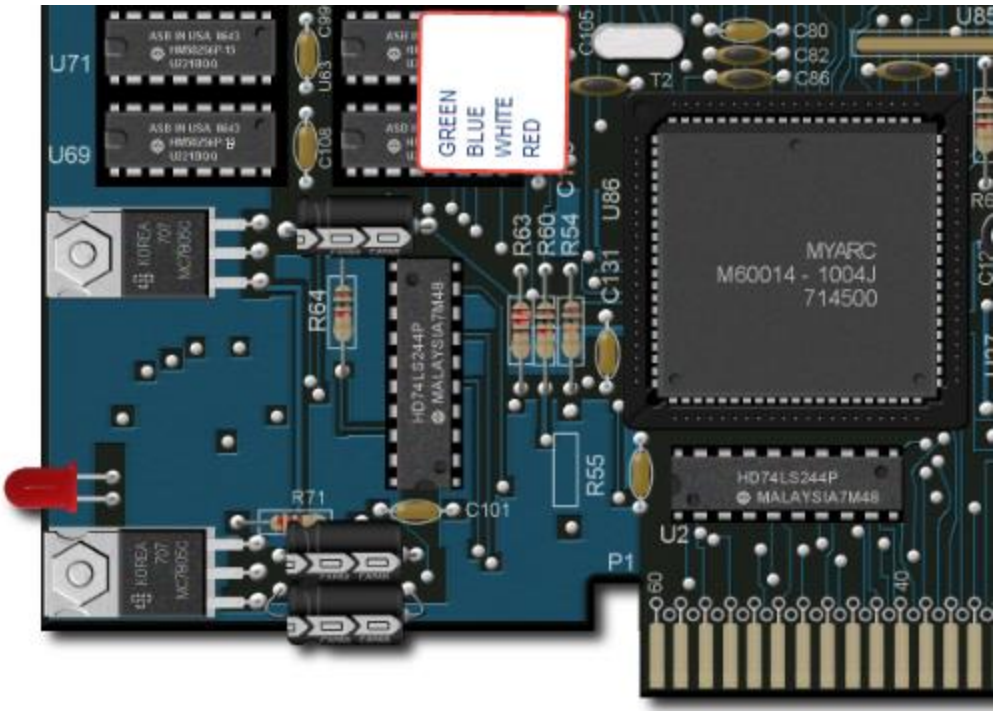
Installing the Module

Before we install the module the easiest way to route the wires is underneath the module as stated above.
Take the 4 x 10-inch wires (RED, WHITE, BLUE and GREEN) and the 5-inch BLACK wire and route under the module on the left side towards the diodes. Take the shorter 3 x 3-inch wires (BLACK, GREEN and YELLOW) and ensure they are routed out of the right side of the module.

Now plug the module into the SRAM socket. Ensure PIN #1 of the module is closest to the CR2030 battery. (to the right) as shown in the photo below.

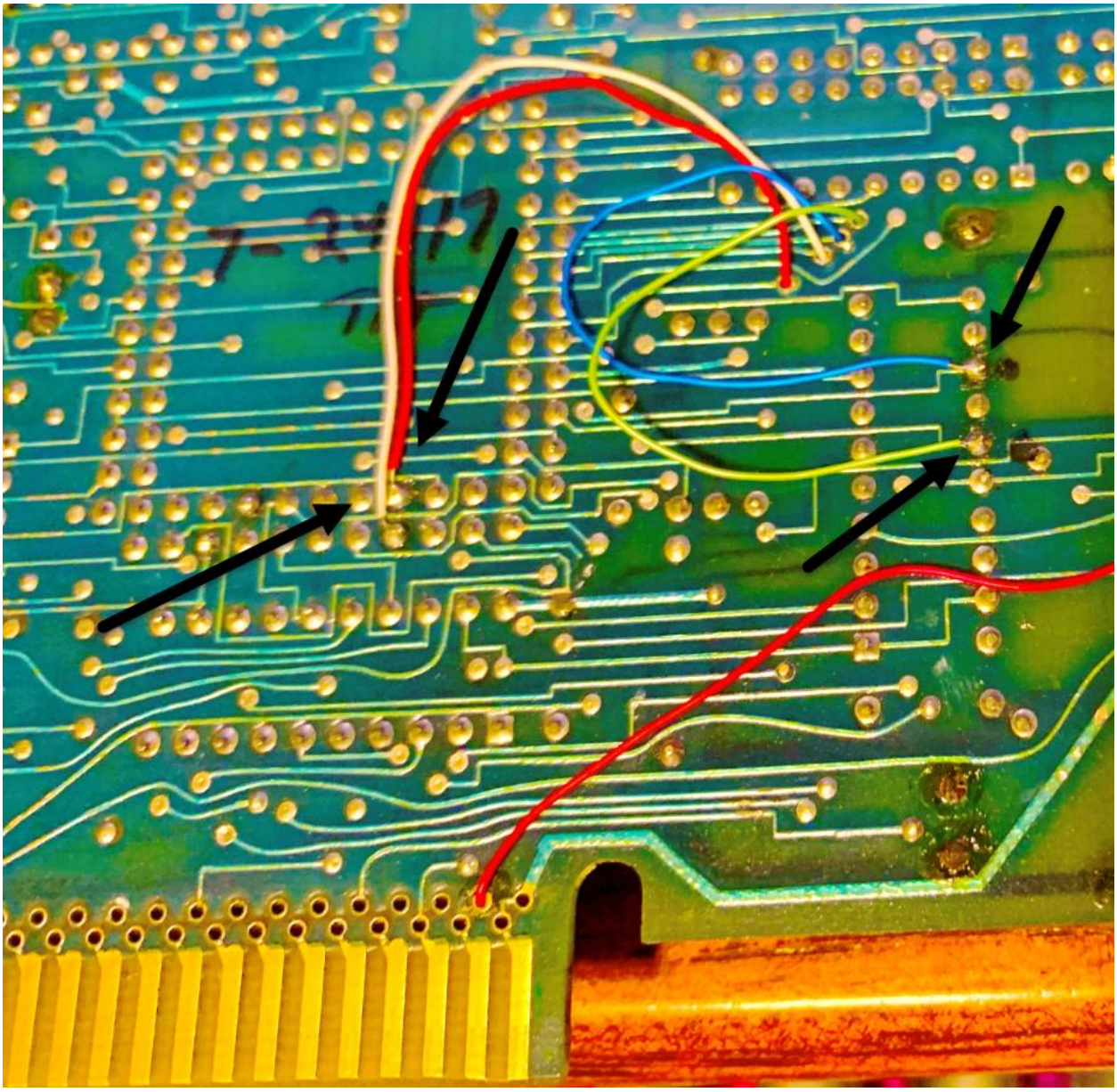


Now let's start routing and soldering!
Remember where we vacuumed some vias. This is where we are routing the wires.
Locate JM1 Pin #3 and solder the 5-inch black wire to it. Now before soldering it measure the wire up and cut off enough to leave 1 inch of slack and solder it to JM1 Pin #3.
Locate JM3 Pin #3 and solder the other BLACK wire there leaving about 1 inch slack.
Solder the short GREEN wire to JM3 Pin #2 leaving about 1 inch slack.
Solder the yellow wire via near C128 leaving about 1 inch slack.
Take the RED, WHITE, BLUE and GREEN wires and run them under the 2 ceramic capacitors near the TMS9995 and the GATE ARRAY. This allows for the wires to be more secure.
Rout them according to the below photo reference:



1. Once routed through the holes and all the wires are neatly tucked on the top of the board go ahead and flip it over.

2. See photo referenced with the black arrows:



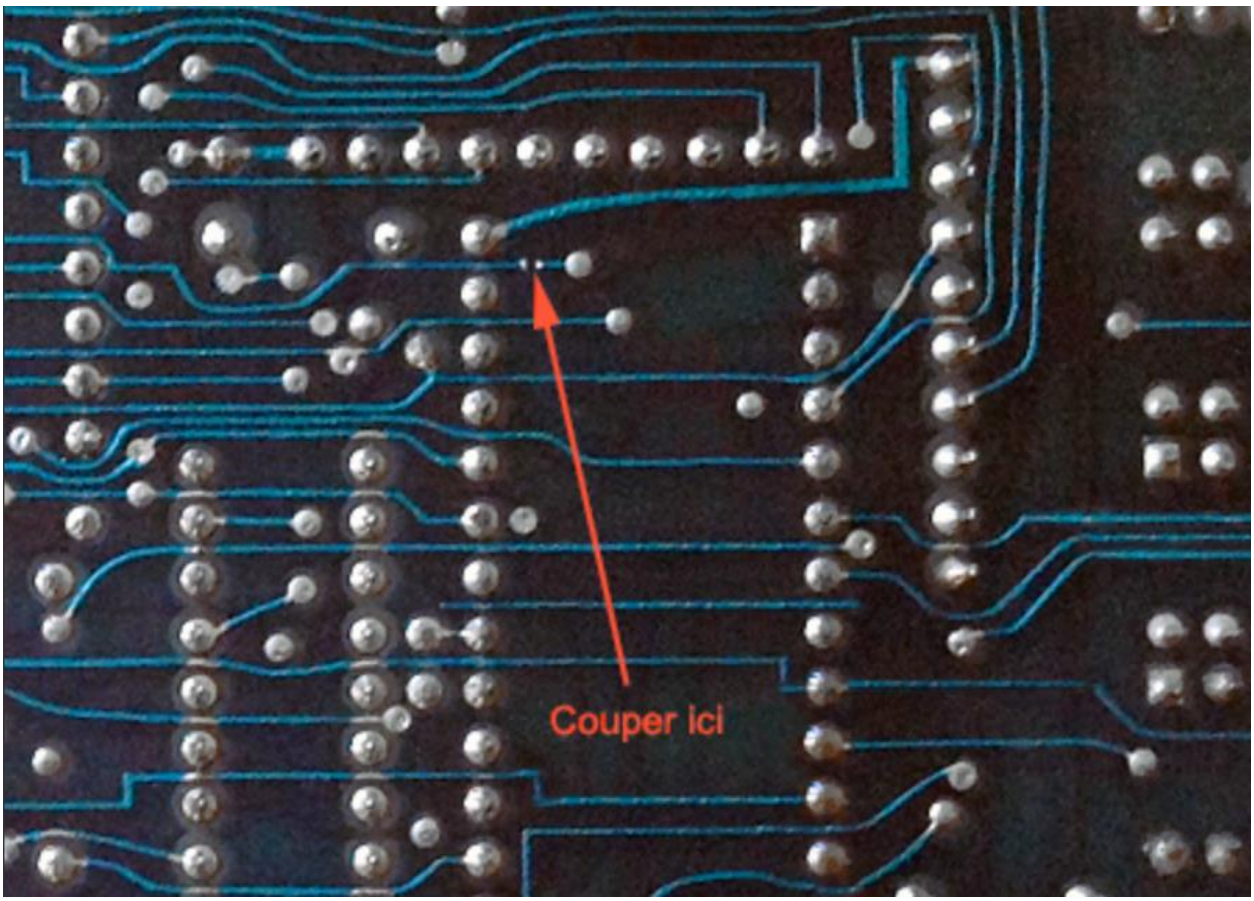
a. Solder the RED wire to pin #42 of the GATE ARRAY
b. Solder the WHITE wire to pin #39 of the GATE ARRAY
c. Solder the BLUE wire to pin #13 of the 74LS244
d. Solder the GREEN wire to Pin #15 of the 74LS244

Cutting Trace

The final step for wiring the new memory module up is a trace needs to cut on your Geneve in order for this to function but you will have a lot more memory when done.

The trace that needs to be cut is the CS line (pin #49) of the GATE ARRAY. The CS line for the memory upgrade will now be supplied by the onboard 74LS138 chip on the 838-384k memory module.

The trace is located on the bottom side of the Geneve under the TMS9901.



Final Steps

Now we are ready to put everything back together.

Triple-check everything!

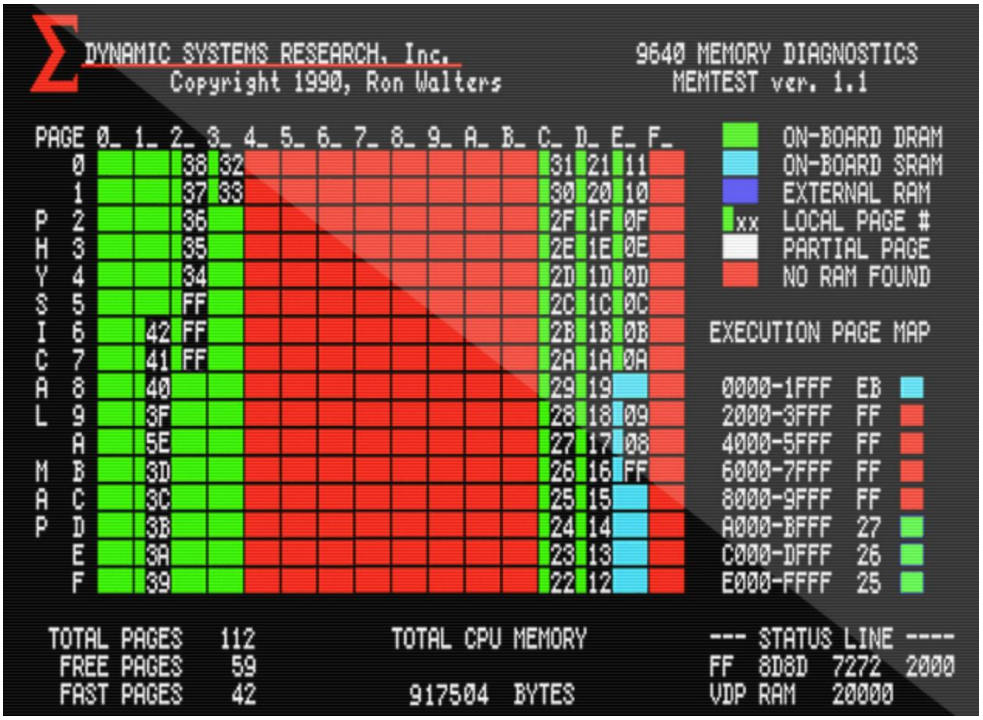
- Check all the referenced connections with a multimeter in continuity mode.
- Verify that none of your soldering has resulted in runover to pins on either side.
- Reinstall the CR2032 battery
- Reinstall the Geneve into its clamshell if it was in one.

Testing

- Insert the Geneve back into the PEB
- Connect your video and keyboard cables
- Remove any other memory card(s) installed in the PEB
- Power on the PEB and ensure the system boots to MDOS.
- Type "CHKDSK" at the command prompt and press ENTER

Under MDOS 6.50 as well as MDOS 7.30, the total memory should read "917504 bytes of total memory".

If you run the "MEMTEST" program the on-board SRAM from >C0 and >EF will now be available. This will give you 48 banks of memory at 8kb each.



Based on the concept by Don Walden from Cecure Electronics (1997).
Based on initial documentation by Tim Tesch (2006)
Documentation cross referenced by Fabrice Montupet (www.ti99.com).
This board developed and tested by Chris Schneider.

Congratulations you have successfully modified your Geneve, it is now equipped with 384k of RAM!