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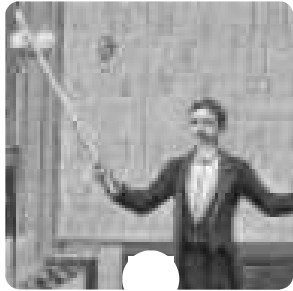
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## How to upgrade Tektronix 4052 or 4054 with latest v5.1 firmware

nikola-wan · Today at 9:43 AM

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**nikola-wan**

Veteran Member

Joined: Mar 6, 2018  
Messages: 1,663  
Location: Texas, USA

Today at 9:43 AM

 #1

Based on [@RolexTM](#) and [@jbstan](#) experience in repairing their non-functional Tektronix 4052 computers in 2025 including replacing the MAS board ROMs with the latest posted v5.1 firmware, this thread summarizes both the 4052-4054 v5.1 firmware update instructions and MAS board modifications suggested by [@daver2](#) and myself and documents why the modifications are required.

**NOTE: These instructions do NOT apply to the 4052A or 4054A computers as they have newer MAS boards with 2764 EPROMs and different firmware (latest is v1.5). They can be upgraded to v1.5 by erasing and reprogramming 2764 EPROMs with the posted v1.5 images:**

**[4052A-MAS-16bit-ROMs-V1.5.zip](#)**

#### **BACKGROUND:**

[@jdreesen](#) posted in his **Diagnostic ROM Pack Remade** thread: <https://forum.vcfed.org/index.php?threads/tektronix-4052-54-diagnostic-rom-pack-remade.63974/post-1315932>

**[threads/tektronix-4052-54-diagnostic-rom-pack-remade.63974/post-1315932](#)**

that the WSI 57C49 EPROMs could be used successfully to replace the 4052 or 4054 clocked

masked ROMs. He attached a file [mas\\_4052\\_57c49-tar-txt](#) to his post with the 4052/4054 v5.1 ROM images transposed to compensate for EPROM address lines A10, A11 and A12 in swapped locations compared to the clocked masked ROM pinout. These WSI 57C49 EPROMs are still available from different suppliers including EBAY auctions and have been tested successfully to replace the 4052/4054 MAS board clocked masked ROMs.

### **Firmware v5.1 Upgrade Instructions for Tektronix 4052 and 4054 vector graphics computers:**

1. Download the v5.1 firmware [mas\\_4052\\_57c49-tar-txt](#) from [@jdreesen](#) post in his **4052 Diagnostic ROM Pack Remade** thread
  - Remove the .txt extension from this file and use WinRar or other utility to extract the tar archive into individual .s19 SREC format files
  - Use HxD or other utility to import each S19 file as Motorola S-Record and then save each one as a .bin BINARY file for programming
2. Program and verify each file into a WSI 57C49B EPROM and write the U# and Tektronix Part No on a label over

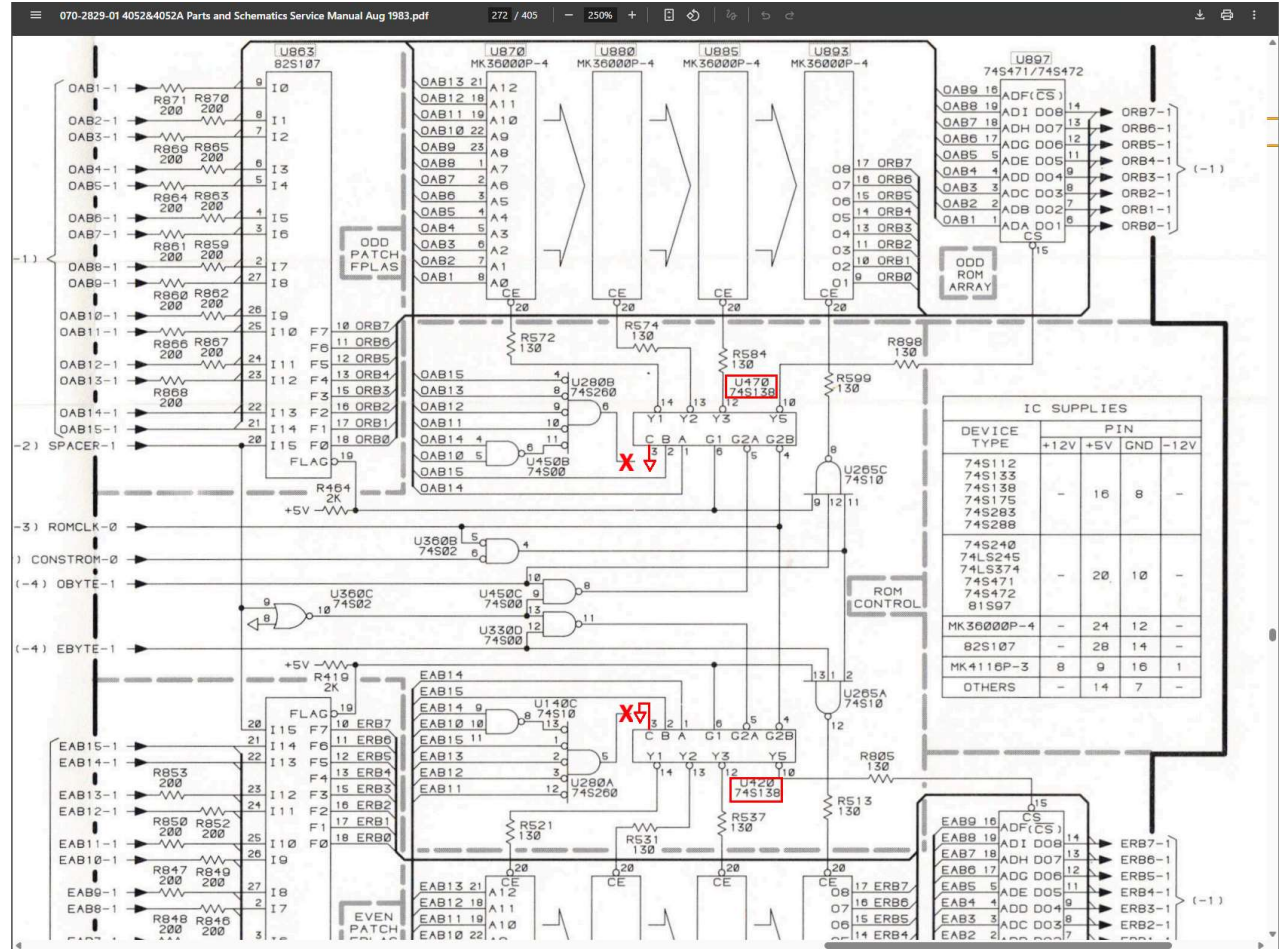
the EPROM window (table below)

3. Remove the U845 and U863 FPLA ROMs if present on your MAS board
4. Remove the U805 and U897 PATCH ROMs if present on your MAS board
5. Replace all eight ROMs - one at a time with your 57C49 EPROM based on the EPROM with the same U# as the ROM you are replacing
6. Carefully cut U420 (74S138) PIN 3 from the PCB and solder a jumper wire from U420 PIN 3 to U470 PIN 8 to ground PIN 3 as shown in schematic below the table.
7. Carefully cut U470 (74S138) PIN 3 from the PCB and solder a jumper wire from U470 PIN 3 to U470 PIN 8 to ground PIN 3 as shown in schematic below the table.

	<b>Tektronix Part No for v5.1 firmware</b>	<b>Jos' MAS_4052_57c49 EPROM HEX Motorola S- Record filename</b>	<b>MAS board address range</b>
U810	160-0260-03	57c49-0260-03.S19	E000-FFFF in RAM space - EVEN ROM

U820	160-0261-03	57c49-0261-03.S19	4000-7FFF in ROM space - EVEN ROM
U825	160-0262-03	57c49-0262-03.S19	8000-BFFF in ROM space - EVEN ROM
U835	160-0263-04	57c49-0263-04.S19	C000-FFFF in ROM space - EVEN ROM
U870	160-0264-03	57c49-0264-03.S19	4000-7FFF in ROM space - ODD ROM
U880	160-0265-03	57c49-0265-03.S19	8000-BFFF in ROM space - ODD ROM
U885	160-0266-04	57c49-0266-04.S19	C000-FFFF in ROM space - ODD ROM
U893	160-0267-03	57c49-0267-03.S19	E000-FFFF in RAM space - ODD ROM

The schematic is marked in RED X for the cut and the GROUND is a RED TRIANGLE for the mod at U420 and U470. These are both 16-pin 74S138 with the PIN 8 ground on the same side as the cut on PIN 3.



This modification is needed on the MAS board for v5.1 firmware upgrade because v5.1 firmware is the ONLY 4052-4054 version with code in the 4400-47FF PATCH ROM address range as I discovered in my post 132 in the tektronix-4052-repair thread authored by [@RolexTM](#)

"Looking at the 4052 JUMP TABLE I see the following entries

into the 4400-47FF range with the 4052 Assembler manual note for that JUMP Table address:"

Code:

```
;41B9: 7E 46 08 Reaval - READ a Value<br>  
;41B6: 7E 46 1C Reastg - READ a String<br>  
;422E: 7E 46 97 Wristg - WRITE a String<br>  
;4231: 7E 46 C7 Wrival - WRITE a Value<br>  
;4036: 7E 46 E3 Datin - READ from a DATA statement
```

Both [@RolexTM](#) and [@jbstan](#) encountered SYSTEM ERRORS on their MAS boards with v5.1 firmware upgrades after they only grounded the C inputs of U420 and U470.

After also cutting the U280 PINs 5 and 6 - they had no SYSTEM ERRORS running BASIC programs including DATA statements and running the Diagnostic ROM Pack from [@jdreesen](#) they both got the exact same results as Jos reported in his first post on his 4052 Diagnostic ROM Pack Remade thread - which also duplicated the Tektronix service note on 4052-4054 ROM CRCs:  
**[4052-4054 FW Info July 1983](#)**

### Credits:

Thanks to [@jdreesen](#), [@RolexTM](#), [@jbstan](#), [@daver2](#) and myself perseverance over a couple of months of helping [@RolexTM](#) and [@jbstan](#) repair their 4052 computers and finding bad ROMs and deciding to replace all eight ROMs with

v5.1 firmware in EPROMs.

31 minutes ago

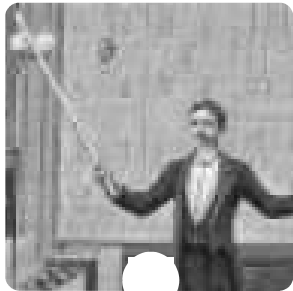
Last edited: Today at 11:14 AM #2

Cut and paste error in my step 6 instruction above. I can't edit that post now - line 6 needs to look like this:

6. Carefully cut U420 (74S138) PIN 3 from the PCB and solder a jumper wire from U420 PIN 3 to [U420](#) PIN 8 to ground PIN 3 as shown in schematic below the table.

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**nikola-wan**

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**B** *I*





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