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Service Note

99-044 Rev D
16 June, 2008

IDENTIFYING API CPU's

I. PURPOSE:

To guide you through identifying API CPU assemblies, what chips go into each CPU's, and what proms go into the CPU assemblies.

II. SCOPE:

This service note pertains to all STANDARD CPU assemblies used in API analyzers.

III. PARTS:

N/A

IV. TOOLS:

N/A

V. PROCEDURE:

1. There are three basic configurations of the CPU assembly that API has used for the computer controlled analyzers:
   - The first configuration is the old non-AMX (Xinu) CPU assembly.
   - The second configuration is the new non-AMX (Xinu) CPU assembly.
   - The third configuration is the new AMX CPU assembly.
2. Pages 3, 4, and 5 of this note show the EPROM, Smart Watch/ram, and E-prom configurations of the CPU assemblies. They also show the jumper configurations of the CPU assemblies.

   Note: There are a few CPU configurations that were built as specials for customers. These CPUs do not apply to these three CPU configurations. The majority of the CPU assemblies that we have configured are of these three configurations.

3. To determine if your CPU assembly is an AMX CPU assembly, look at page 6 of this service note. If your CPU has these jumpers on the solder side of the CPU assembly then this CPU is an AMX.
4. We also have CE mark (European specification) CPU assemblies that have one more jumper and a capacitor on the processor that requires the cutting of a trace on the CPU assembly (see page 7 of this service note). The CE mark CPU can be either AMX or Xinu operating system.
5. To tell what CPU assembly you need, you are going to have to know what the prom revision is that you are trying to use. Once you know what the prom revision is look on the table (pages 8 through 10) and see what size EPROM you are going to need. Once you have determined the size of EPROM go to the table that is at the very end of the service note and see what CPU configuration you are going to need.
6. Check the diagrams that are on pages 3 – 5 of this service note to see if your CPU is configured correctly. If it is not then you will have to change the CPU assembly to reflect the proper diagram.
7. Assuming that your CPU assembly works the CPU should turn on and fire up. If it does not then you are going to have to assume that there is a broken component on the CPU assembly. To

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figure out what the broken item is you are going to have to put one component at a time into a working CPU assembly until you find the component that does not work.

8. The part numbers that are on all the diagrams in this service note are API part numbers and they should be purchased from API. Some of the components that go onto the CPU assemblies that we use in the API analyzers are not off the shelf components. That is to say that we modify some of the components before they are put into the CPU assemblies so that they will work with the software that we have written for our analyzers.
9. Depending on the software, (we have made many special software versions over the years) the CPU that you have might not work with the standard CPU configurations. For the most part all the CPU assemblies work in one of the three configurations that are outlined in this service note. If your analyzer has a CPU that is configured different than this and it is not working, write down the configuration and then change the configuration to reflect the proper diagram. If you still can't get it to work put the configuration back to the way it was when you began and contact the API service department. We may not be able to fix this via a fax or an email and we might require that you send the CPU assembly to the factory so that we can fix it.
10. One point to note is that API does NOT manufacture the CPU's that we use in our analyzers. We buy them from an outside vendor and modify them for our use. This means that API does NOT stock parts for these CPU's. We do have the basic EPROM's, RAM's, Smart Watches and EPROM's, but not the hardware that is provided on the CPU when we receive them.

If you have questions regarding this procedure or any API equipment, please contact an API Customer Service representative at:

Phone: (858) 657-9800
Fax: (858) 657-9816
Email: API-customerservice@teledyne.com
WWW: http://www.teledyne-api.com/

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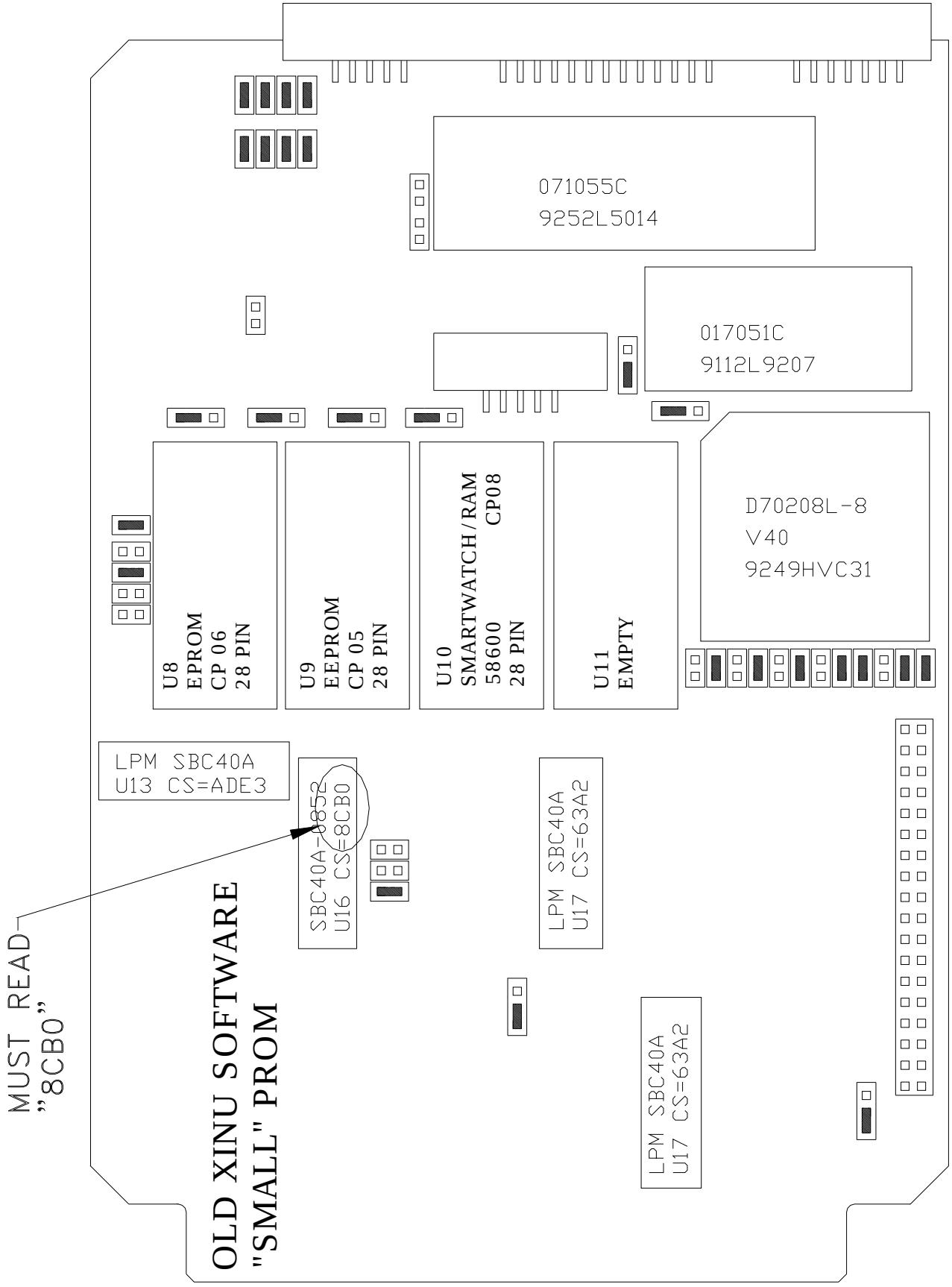

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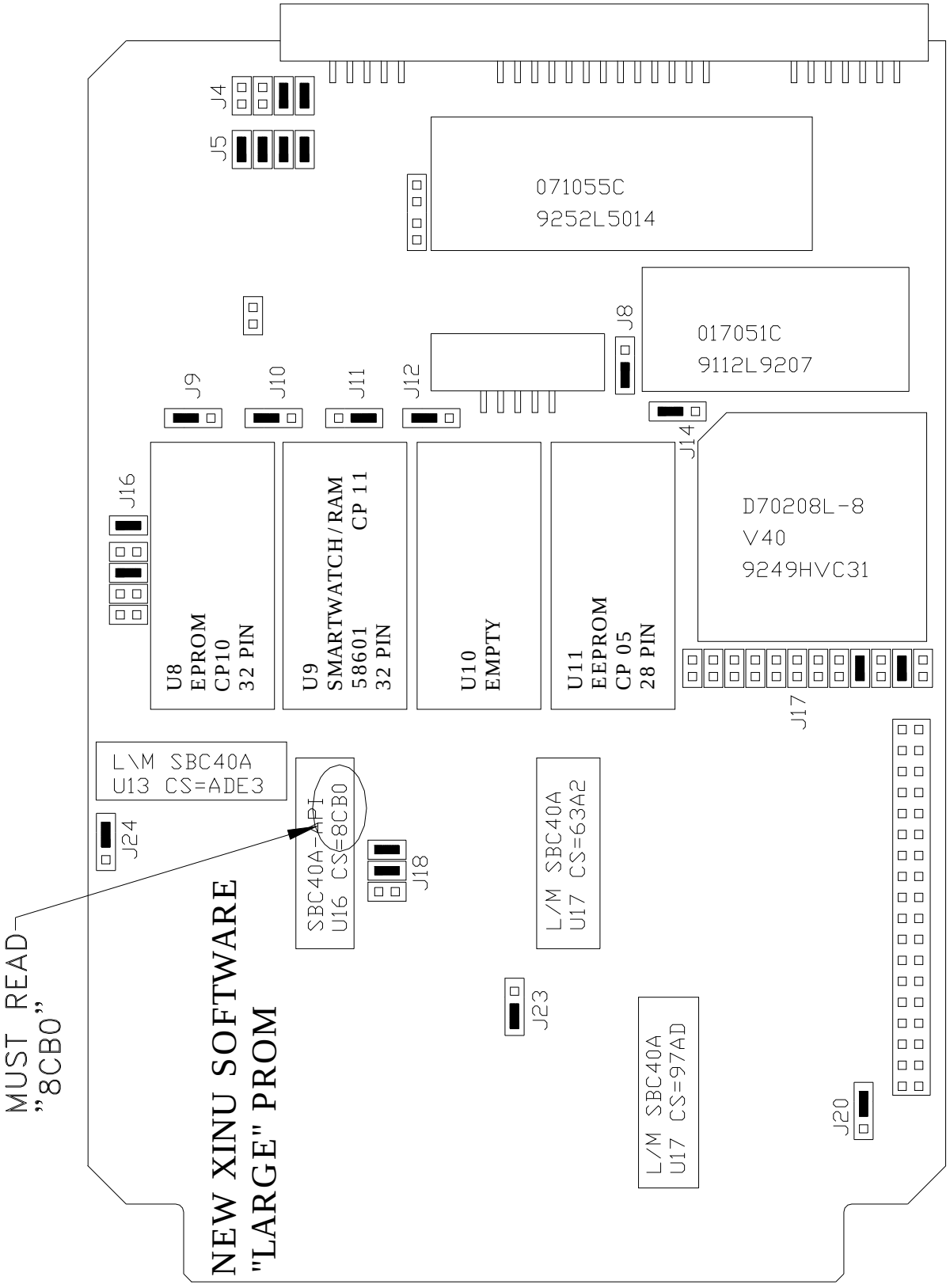

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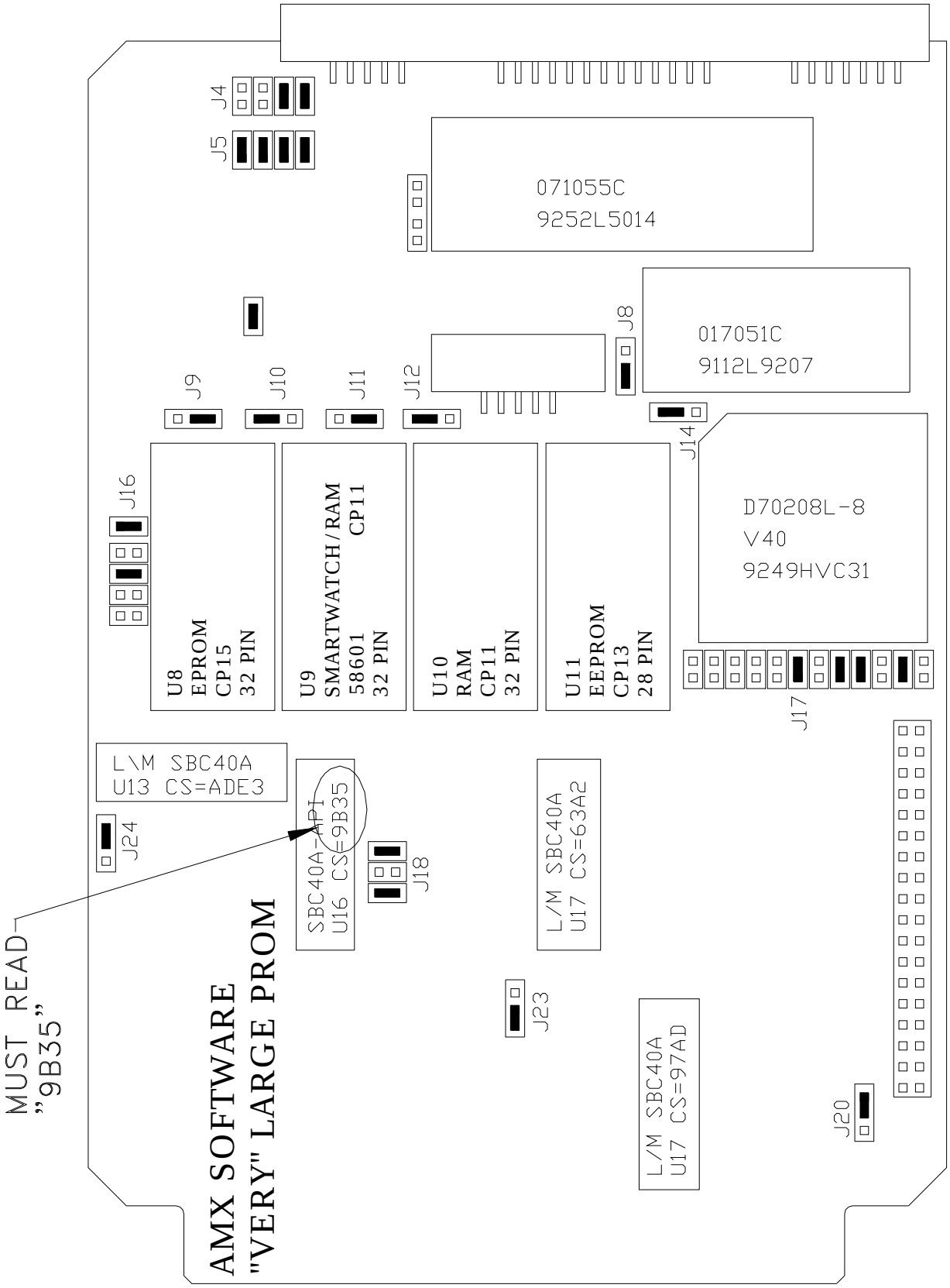

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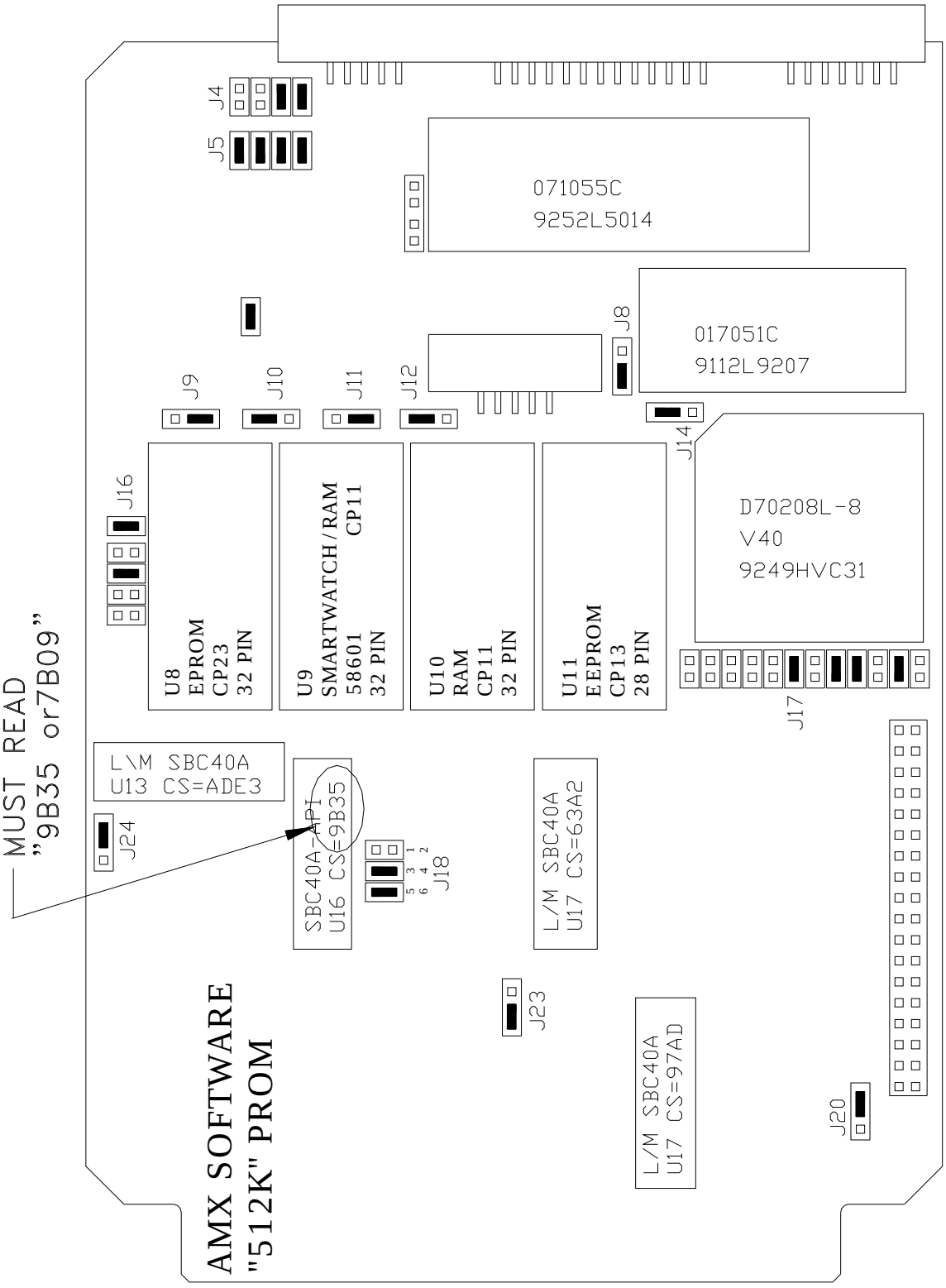

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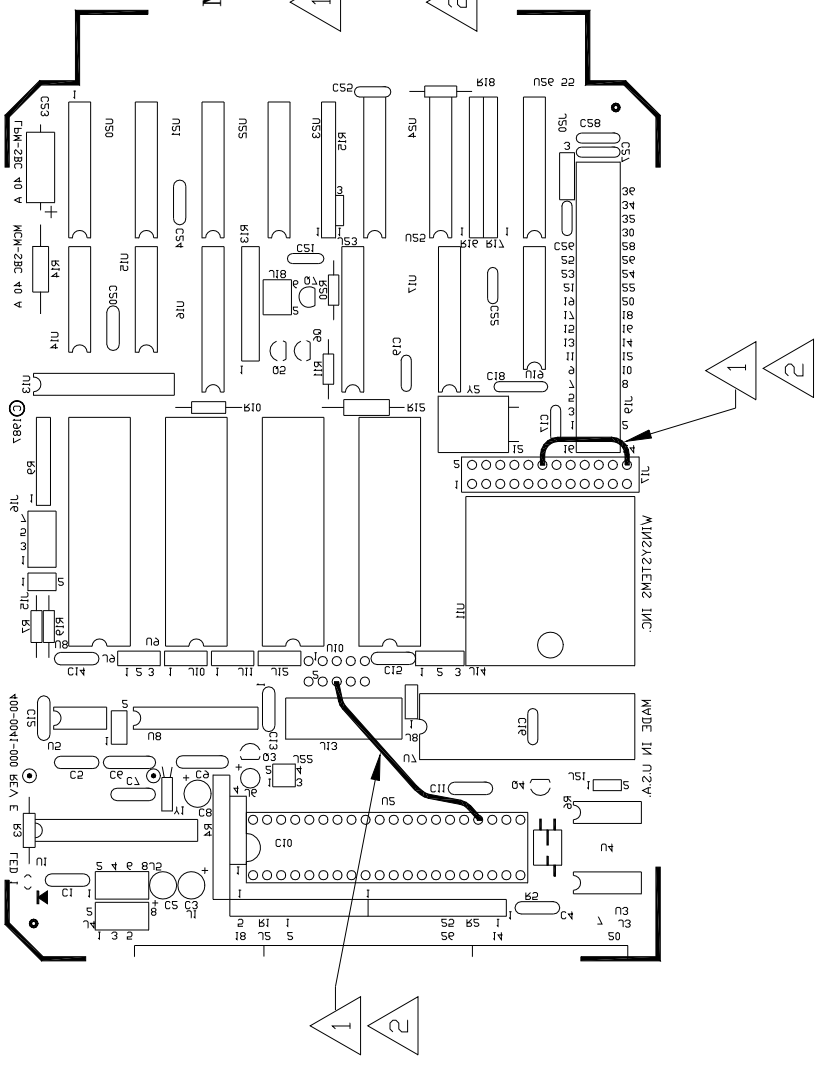
MODIFICATIONS OF CPU FOR AMX SOFTWARE

1 JUMPERS GO ON THE SOLDER SIDE OF THE CPU
J17 PIN 12 TO J17 PIN 24
U2 PIN 17 TO J13 PIN 6

2 ATTACH JUMPERS TO CPU WITH HOT GLUE



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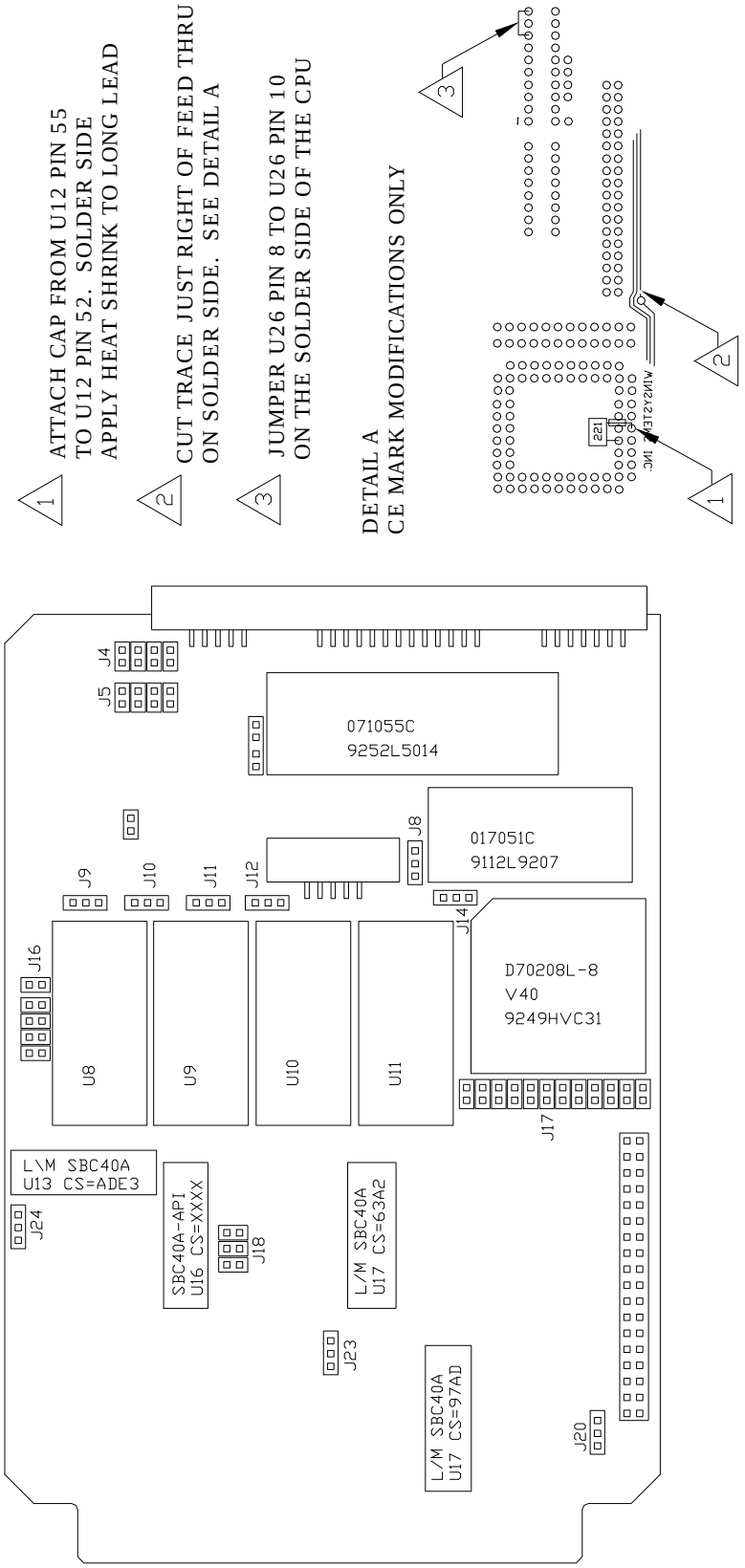

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PROM File Naming Convention

PROM File Name Fields MMMVVCCC.X_Y	
Field	**Description**
MMM	Machine type. Denotes type of gas measured, display type, series (e.g. "A"), operating system platform.
VV or VVV	Firmware revision. A letter, followed by a number, as in "A6". Or a letter, followed by a number, followed by a letter, as in "A6C". If three characters, then the firmware configuration is two characters.
CCC or CC	Firmware configuration. Denotes capabilities of firmware, such as special options, communications protocols, etc.
X_Y	PROM number, in case there is more than one PROM. There has never been more than one PROM, so this feature has never been used.

		Firmware Summary
Machine Type (MMM)	**Description**	**PROM Size[2] (K-bytes)**
M100 AND DERIVATIVES		
100	Old display[1]	Rev. A0-C6: 64 Rev. C7+: 128
102	Old display, TRS	Rev. A0-C6: 64 Rev. C7+: 128
110	New display[1]	Rev. A0-C6: 64 Rev. C7+: 128
111	New display, H2S	Rev. A0-C6: 64 Rev. C7+: 128
112	New display, TRS	Rev. A0-C6: 64 Rev. C7+: 128
M100A AND DERIVATIVES		
110	New display	Rev. H0+: 128
1A0	New display	Rev. H5+: 128
M100A-AMX AND DERIVATIVES		
1AA	New display, AMX	Rev. A0+: 256
1AF	New display, AMX, fast response	Rev. C8+: 256
1AH	New display, AMX, high-level	Rev. A7+: 256
M101A AND DERIVATIVES		
1A1	New display, H2S	Rev. A0+: 128
1A2	New display, TRS	Rev. A0+: 128
M101A-AMX AND DERIVATIVES		
11A	New display, AMX, H2S	Rev. A0+: 256
12A	New display, AMX, TRS	Rev. A0+: 256
M200 AND DERIVATIVES		
200	Old display	Rev. A0-F3: 64 Rev. F3+: 128
210	New display	Rev. A0-F3: 64 Rev. F3+: 128
211	New display, NH3	Rev. A0-F3: 64

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		Rev. F3+: 128
M200A AND DERIVATIVES		
21A	New display	Rev. H0+: 128
2A0	New display	Rev. J0+: 128
M200A-AMX AND DERIVATIVES		
2AA	New display, AMX	Rev. A0+: 256
2AF	New display, AMX, fast response	Rev. E7+: 256
2AH	New display, AMX, high-level	Rev. A0+: 256
2AM	New display, AMX, high-level, medical	Rev. B7+: 256
2AU	New display, AMX, ultra quiet	Rev. C5+: 256
21A	New display, AMX, NH3	Rev. D9+: 256
M300 AND DERIVATIVES		
31X	New display, preliminary	Rev. 00-03: 64 Rev. 04+: 128
310	New display	Rev. A0+: 128
M300-AMX AND DERIVATIVES		
31A	New display, AMX	Rev. A0+: 256
31H	New display, AMX, high-level	Rev. C1+: 256
31S	New display, AMX, high-stability	Rev. D0+: 256
32A	New display, AMX, N2O	Rev. B8+: 256
60A	New display, AMX, CO2	Rev. C5+: 256
M400 AND DERIVATIVES		
400	Old display	Rev. 00-B7: 64 Rev. B8+: 128
40X	Old display, experimental	Rev. 00-B7: 64 Rev. B8+: 128
410	New display	Rev. 00-B7: 64 Rev. B8+: 128
41X	New display, experimental	Rev. 00-B7: 64 Rev. B8+: 128
M400-AMX AND DERIVATIVES		
41A	New display, AMX	Rev. A0+: 256
M400A-AMX AND DERIVATIVES		
4AA	New display, AMX	Rev. A0+: 256
4AH	New display, AMX, high-level	Rev. A6+: 256
M401 AND DERIVATIVES		
401	New display	Rev. A1+: 128
411	New display	Rev. 03+: 128
M450-AMX AND DERIVATIVES		
450	New display, AMX	Rev. A0+: 256
45H	New display, AMX, high-level, experimental	Rev. B8+: 256
M450H-AMX AND DERIVATIVES		
45H	New display, AMX, high-level	Rev. A0+: 256
M552A-AMX AND DERIVATIVES		
552	New display, DOS, AMX	DOS .EXE file
850	New display, DOS, AMX, preliminary name	DOS .EXE file
M700-AMX AND DERIVATIVES		
700	New display, AMX	Rev. A0+: 256

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RI1000-AMX AND DERIVATIVES		
RIA	New display, AMX	Rev. A0+: 256

[1] "Old" display is Noritake S20; "new" display is Noritake T20.
[2] Generally, firmware that uses 64K PROMs also uses 32K RAM's and 8K EEPROM's.
Firmware that uses 128K PROMs uses 128K RAM's and 8K EEPROMs.
All AMX firmware uses 256K PROMs and 2x128K RAM's and 32K EEPROMs.

64K EPROM CP 06
128K EPROM CP 10
256K EPROM CP 15
512K EPROM CP 23

32K RAM CP 08
128K RAM CP 11

SMARTWATCH 586 (GOES WITH CP 08)
SMARTWATCH 58601 (GOES WITH CP 11)

8K EEPROM CP 05
32K EEPROM CP 13

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