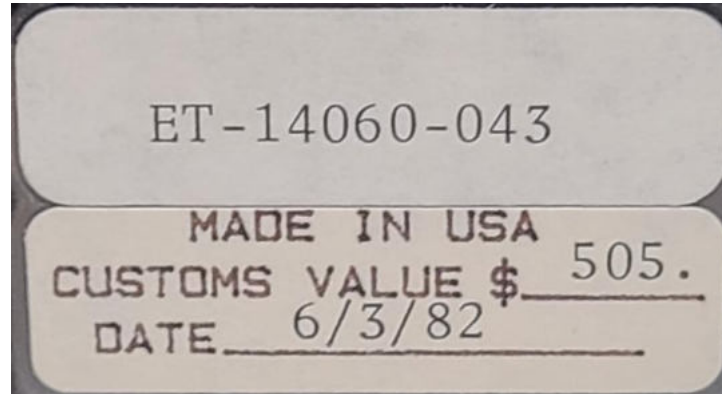


HP-75 S/W Development Prototype



Chuck McCord

Top View





Front View

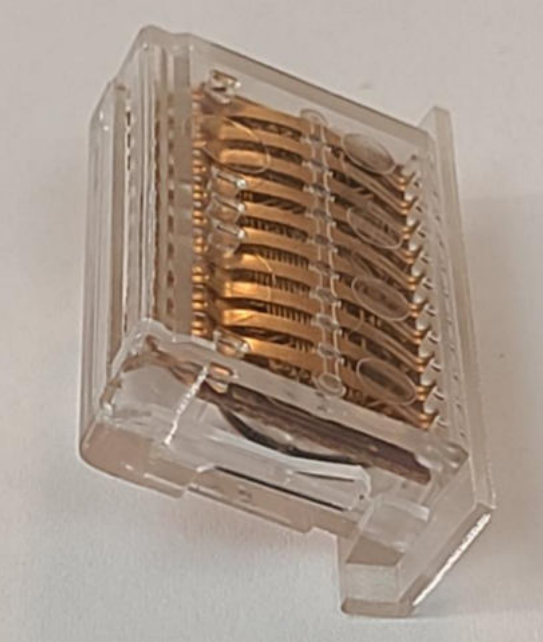
Unit Label

ET-14060-043

MADE IN USA

CUSTOMS VALUE \$ 505.

DATE 6/3/82

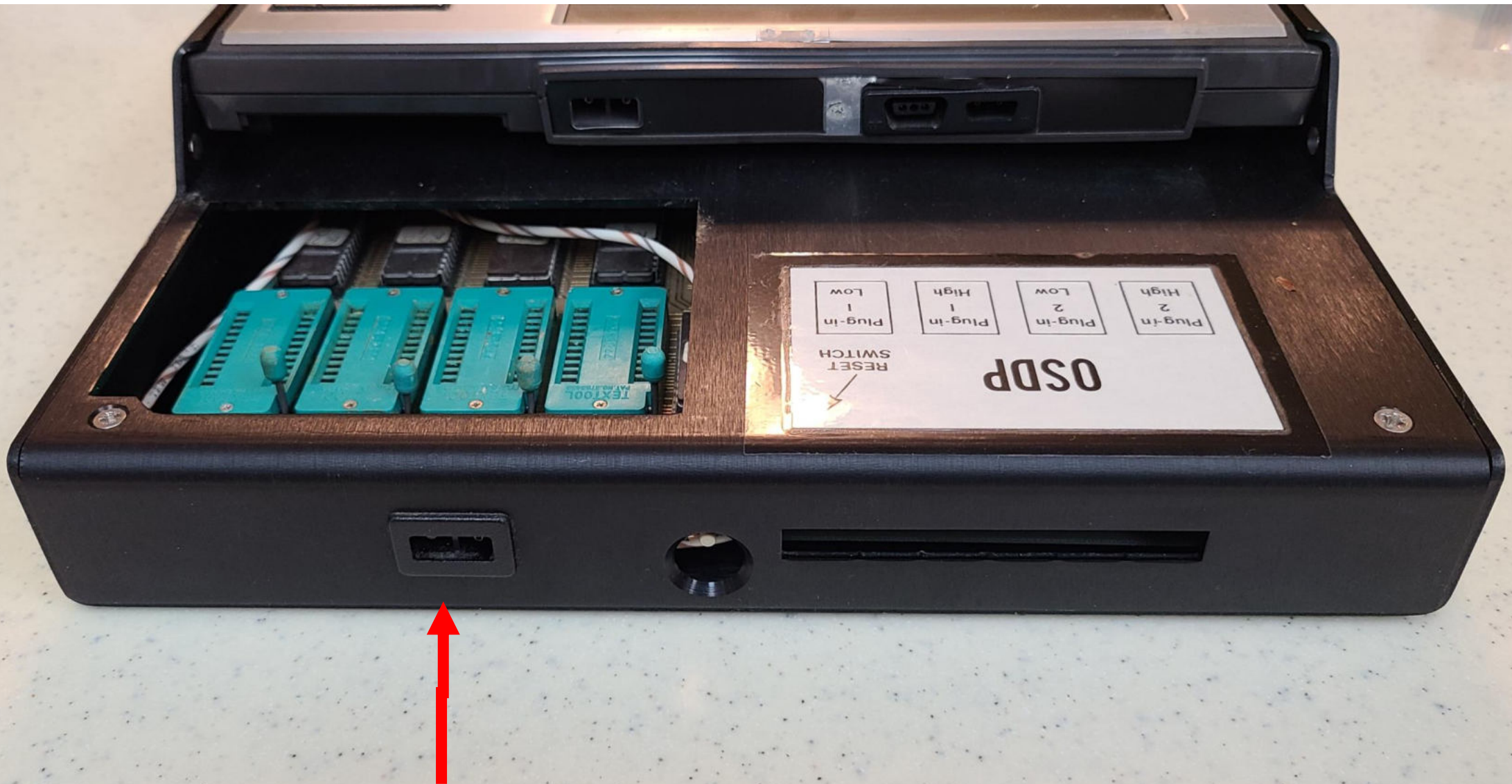


HP75 Plug-in Module



Connected to HP75 with a Plug in module with standard springs and long module PCB





Uses standard HP 75 adapter

Unit Back view



HP 82059B AC adapter



It looks like a stock HP75C

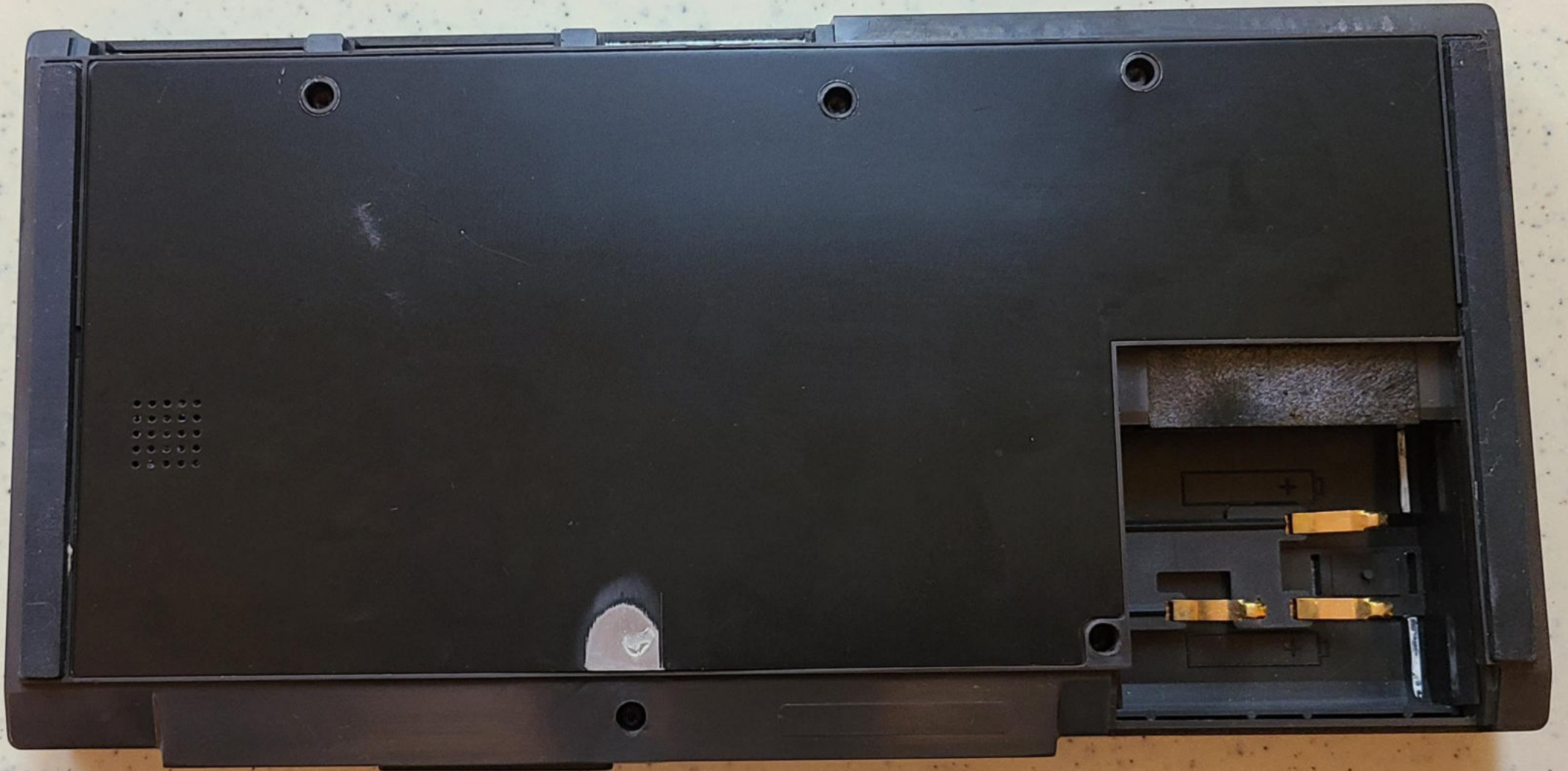


... but it's not ...

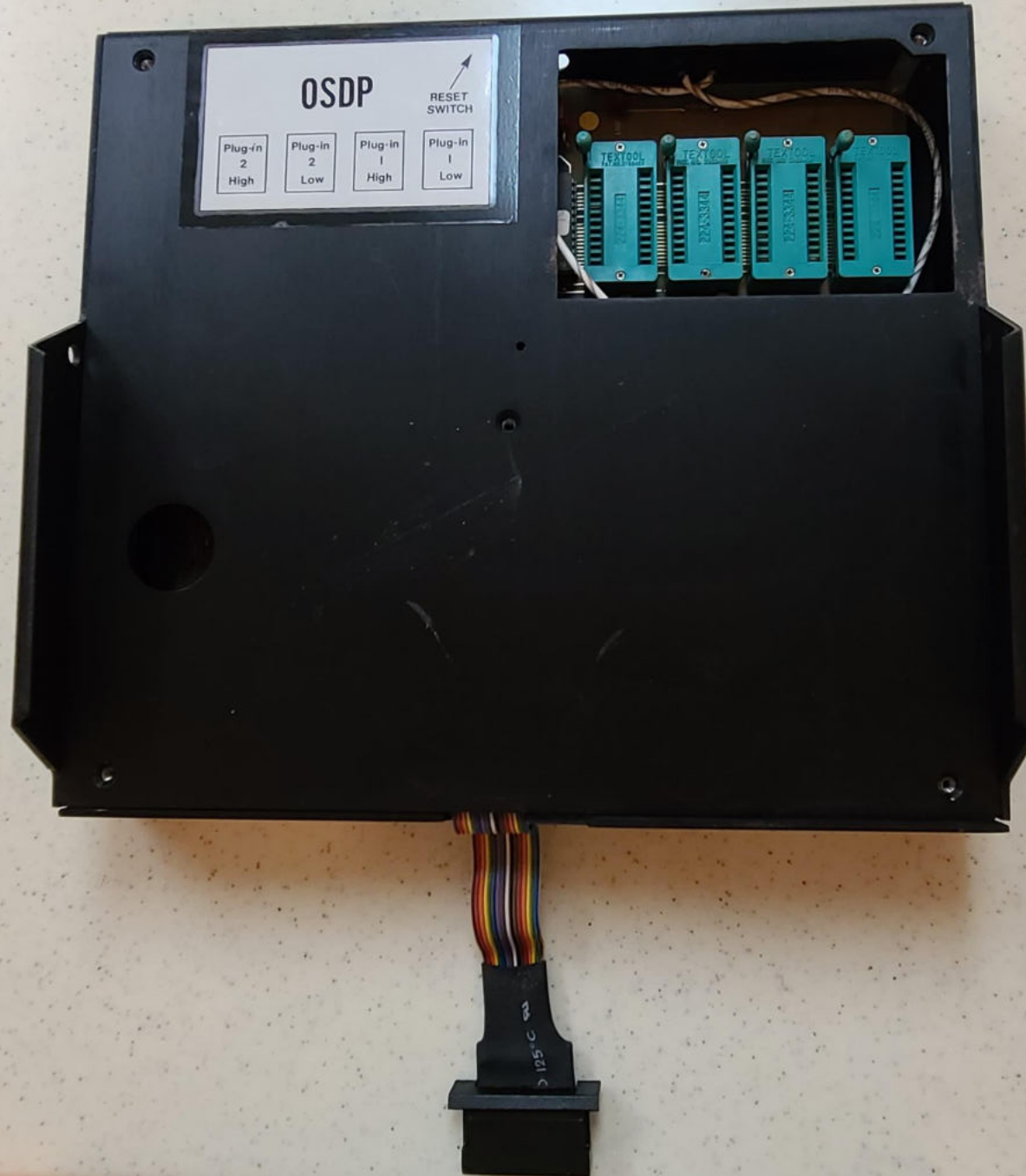


ESD test point

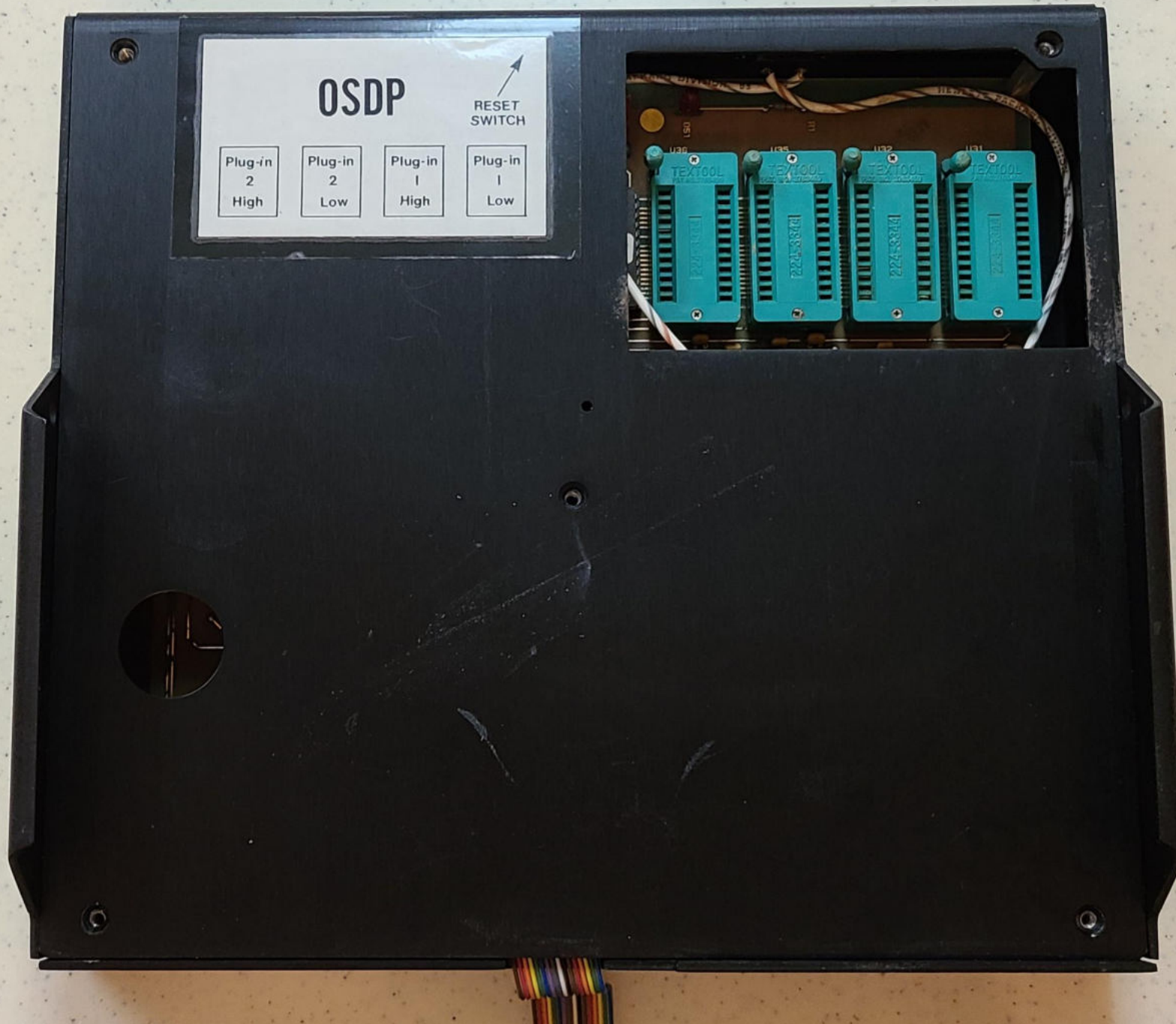
HP75 bottom view

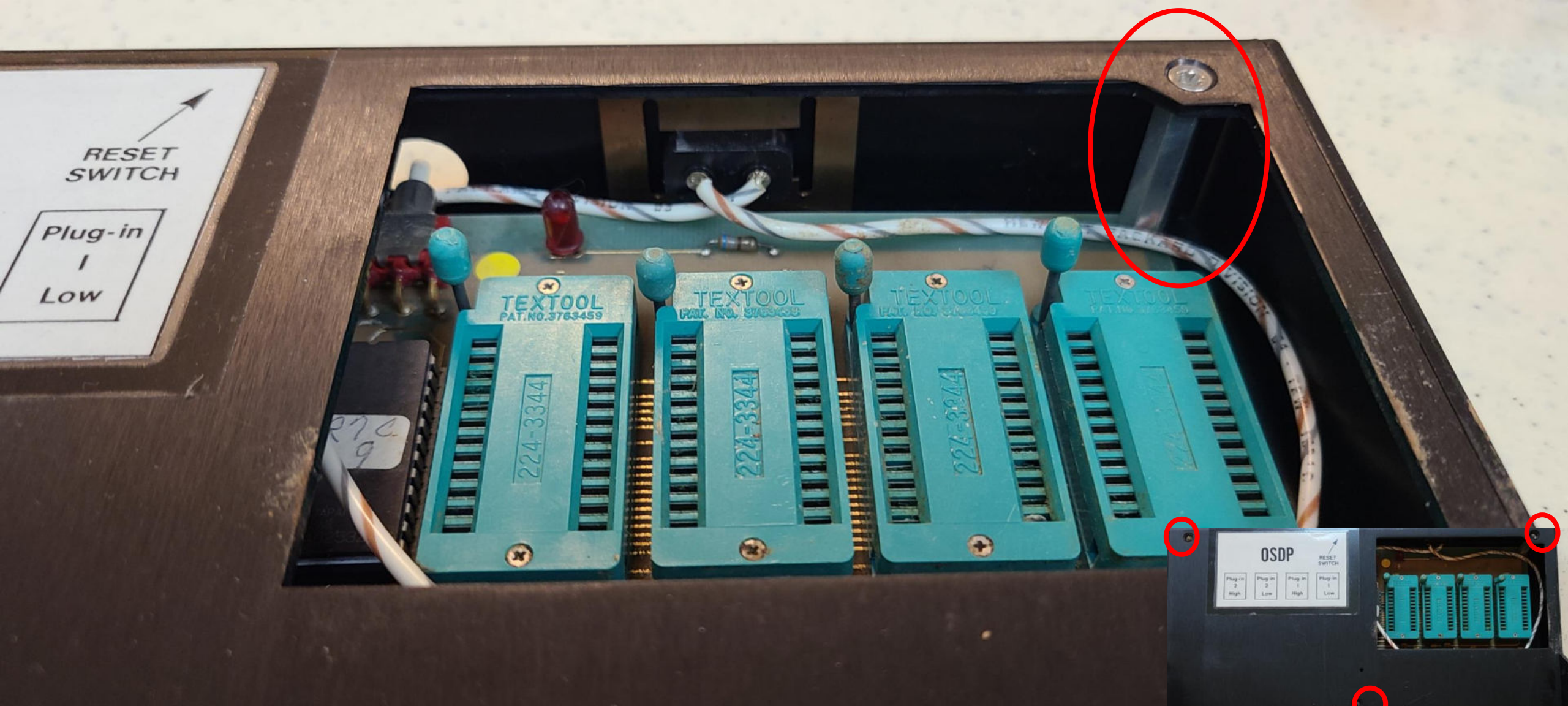


**Top View
After HP75 is
removed**

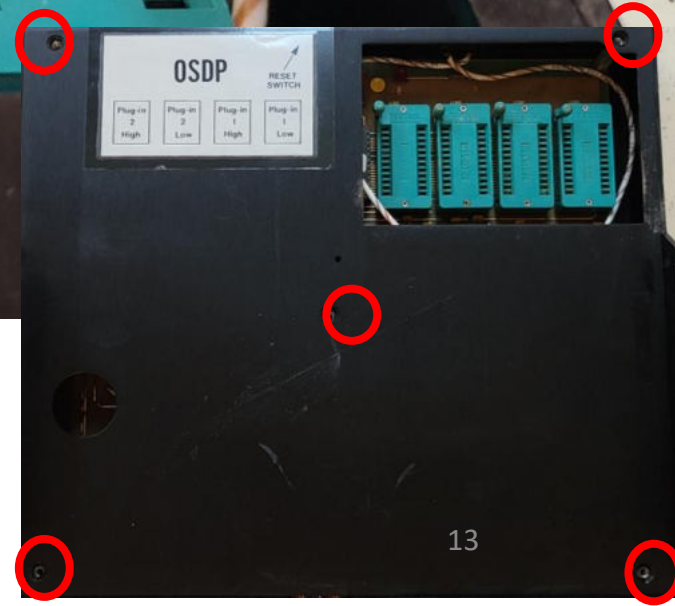


Enlarged View

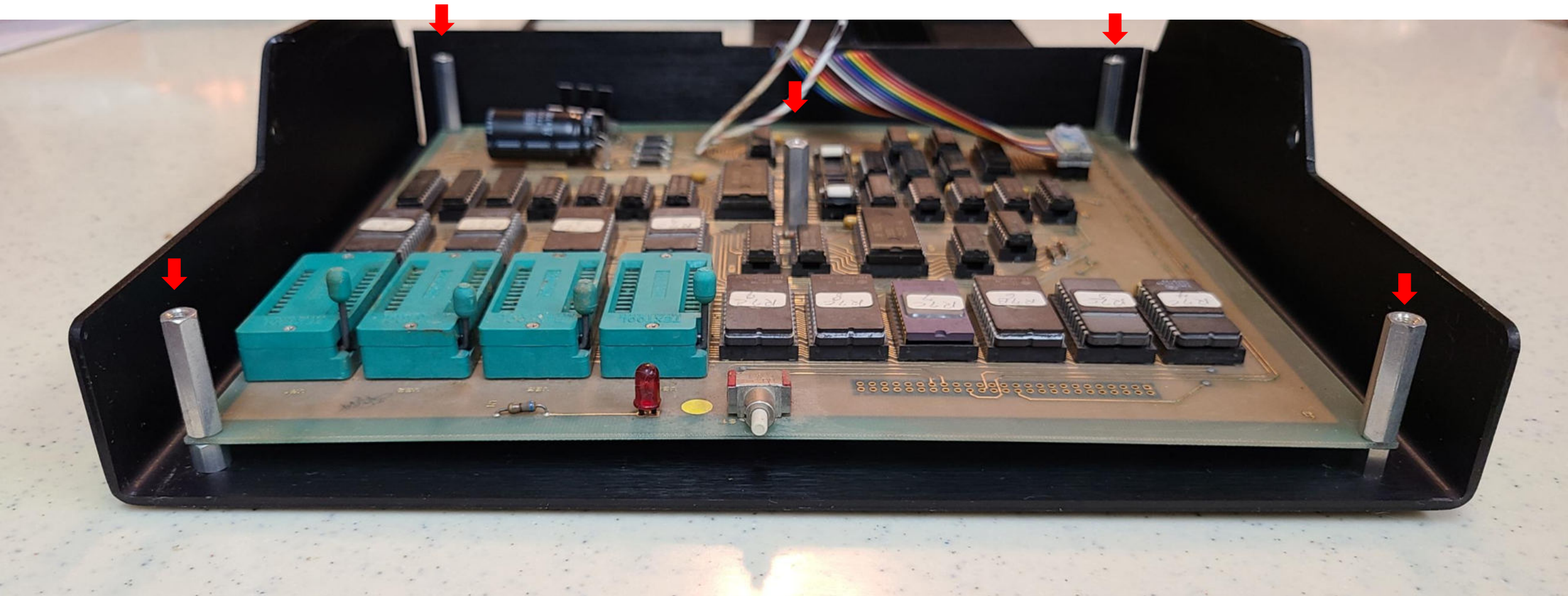




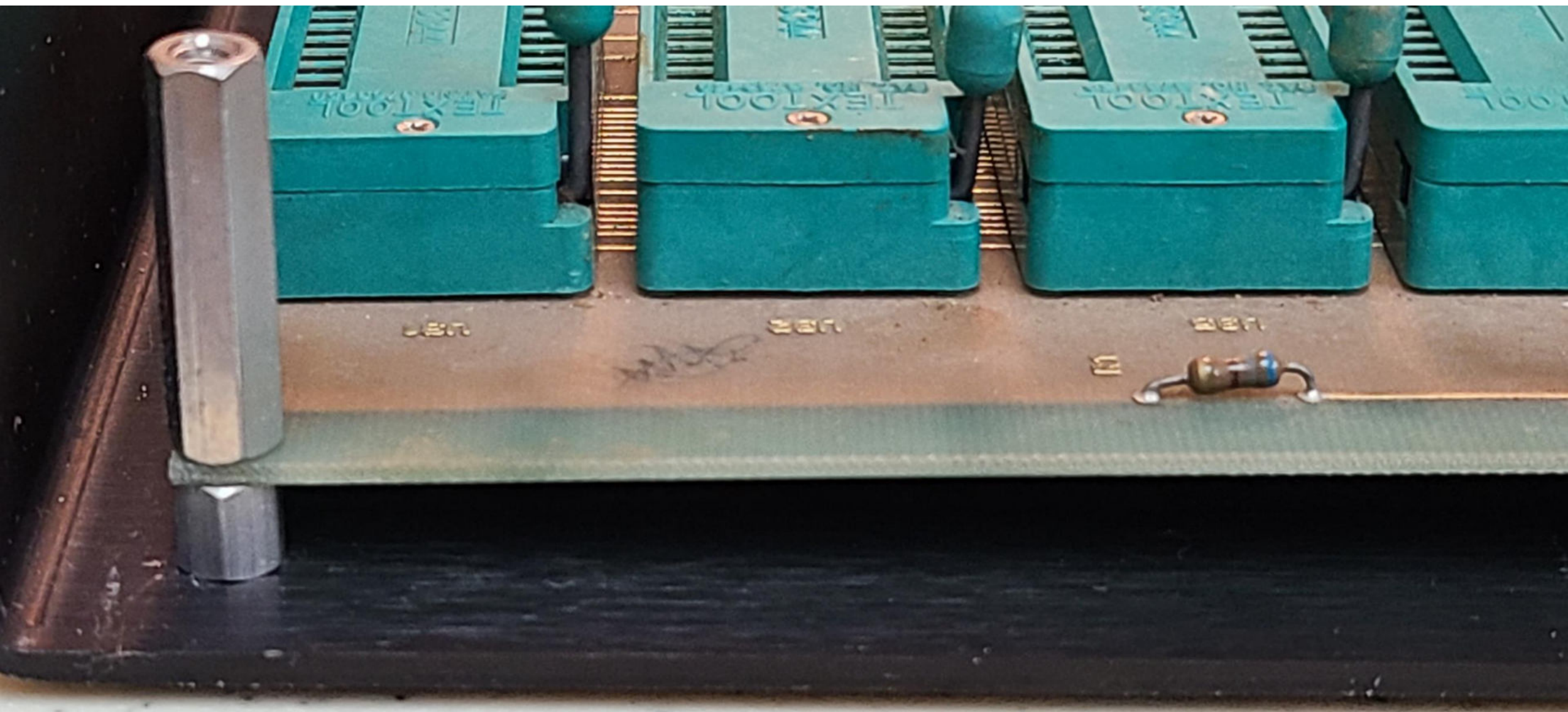
Unit is built with 5 stacked stand-offs



Front



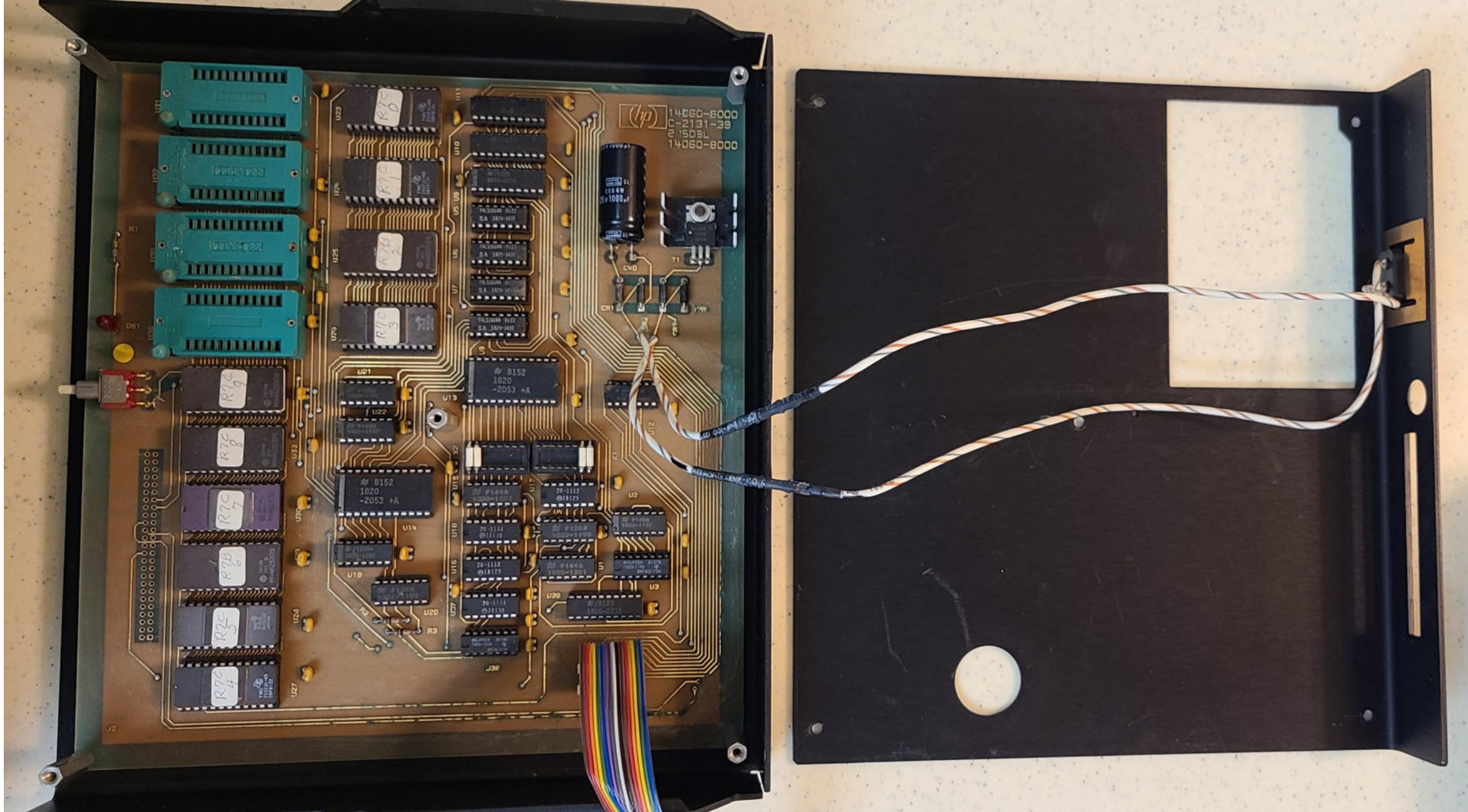
Back



**Bottom stand-off to elevate board above bottom case
Top stand-off to support top case**

B
a
c
k

F
r
o
n
t

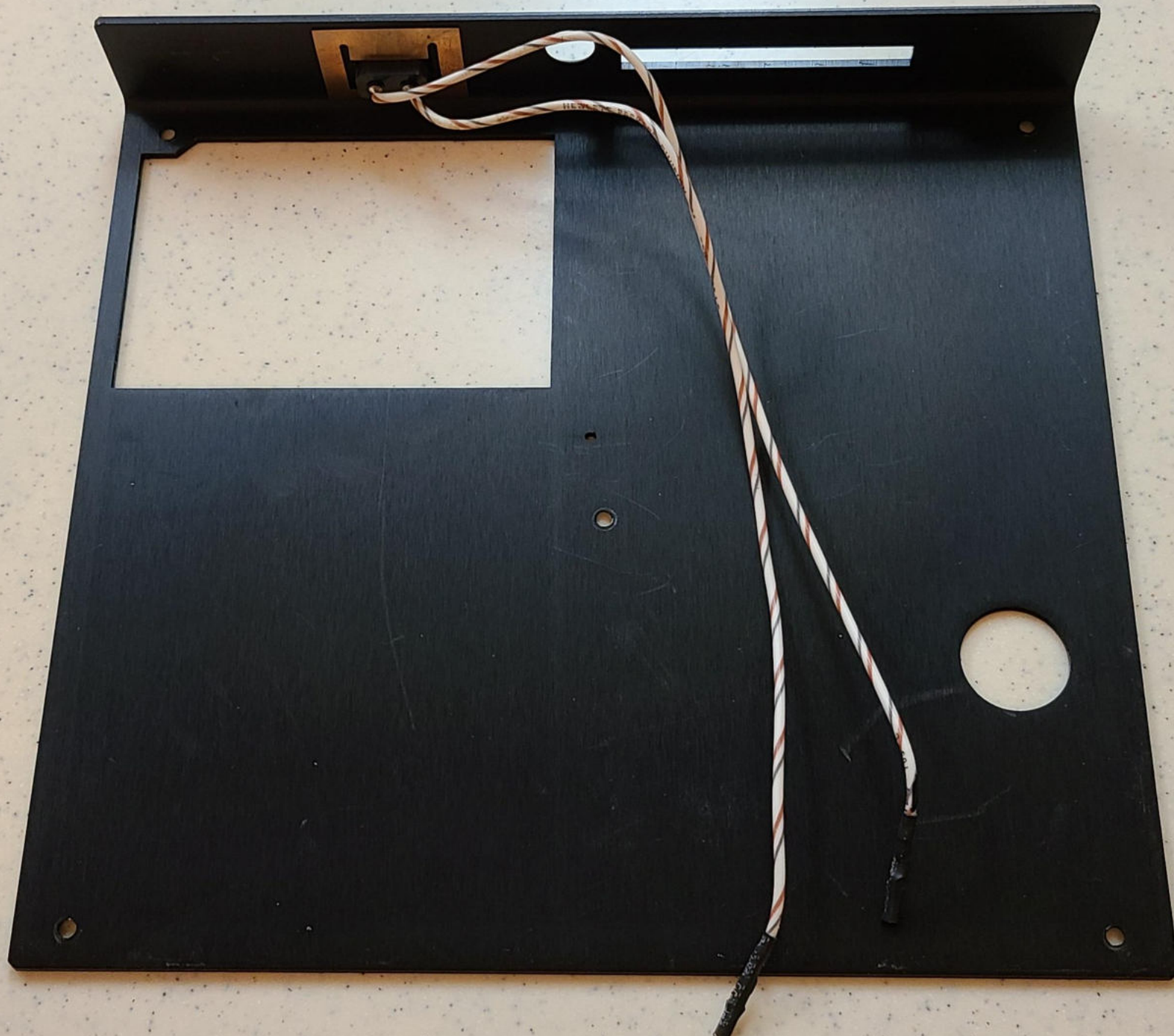


Bottom

Unit folded open

Top

Top Case

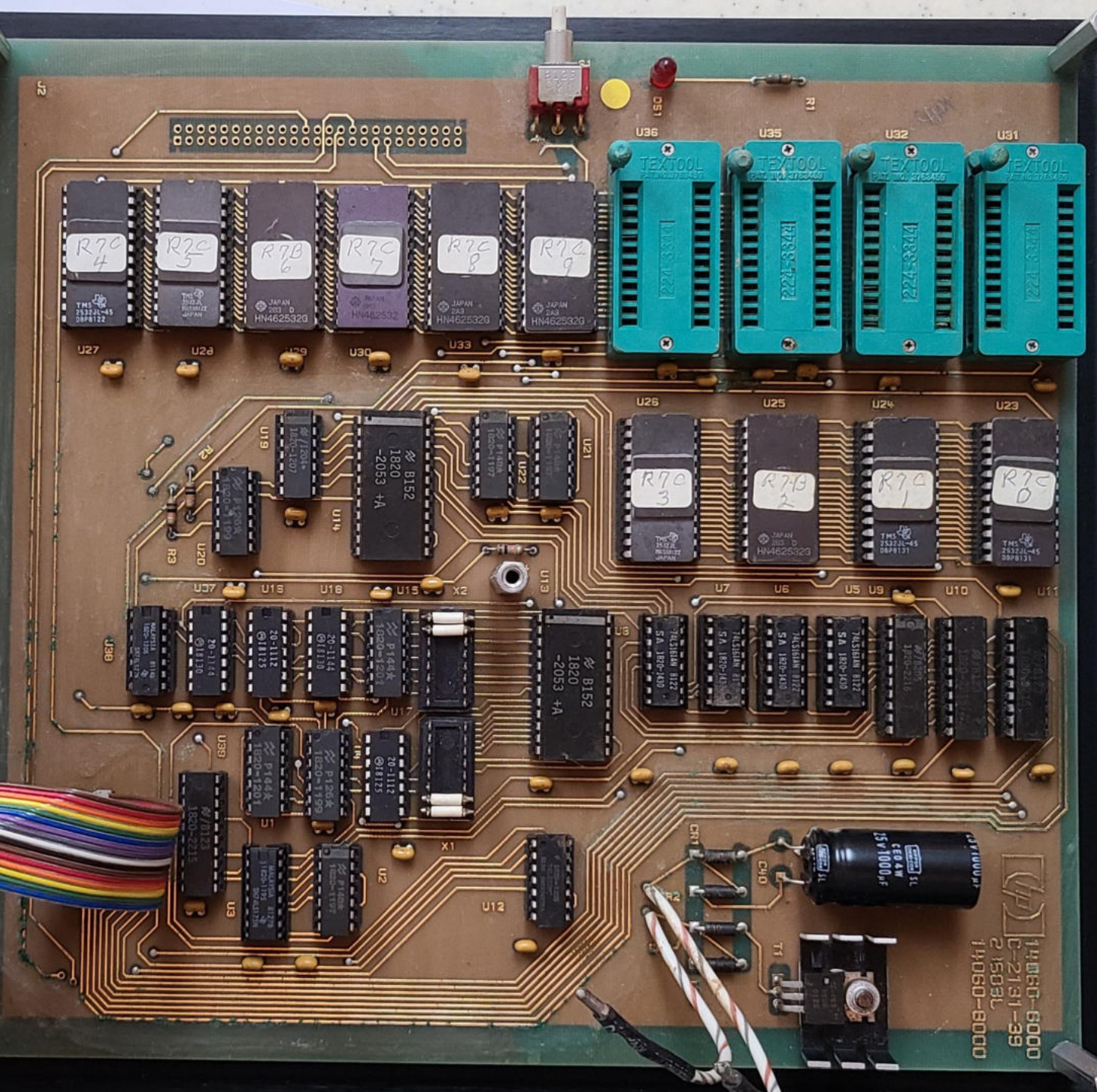


Back

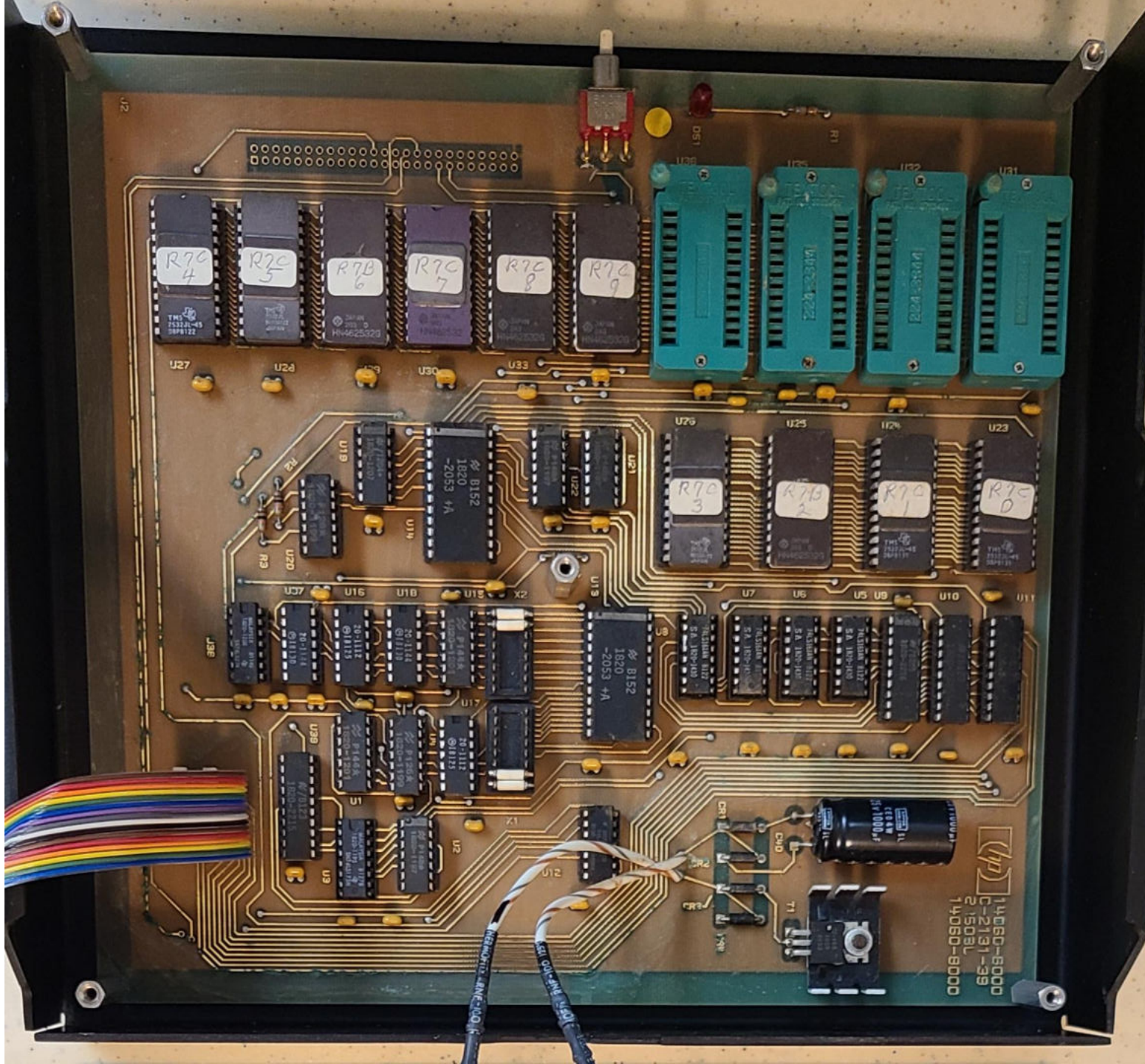
Bottom Case



Front



Enlarged view of Full PCB



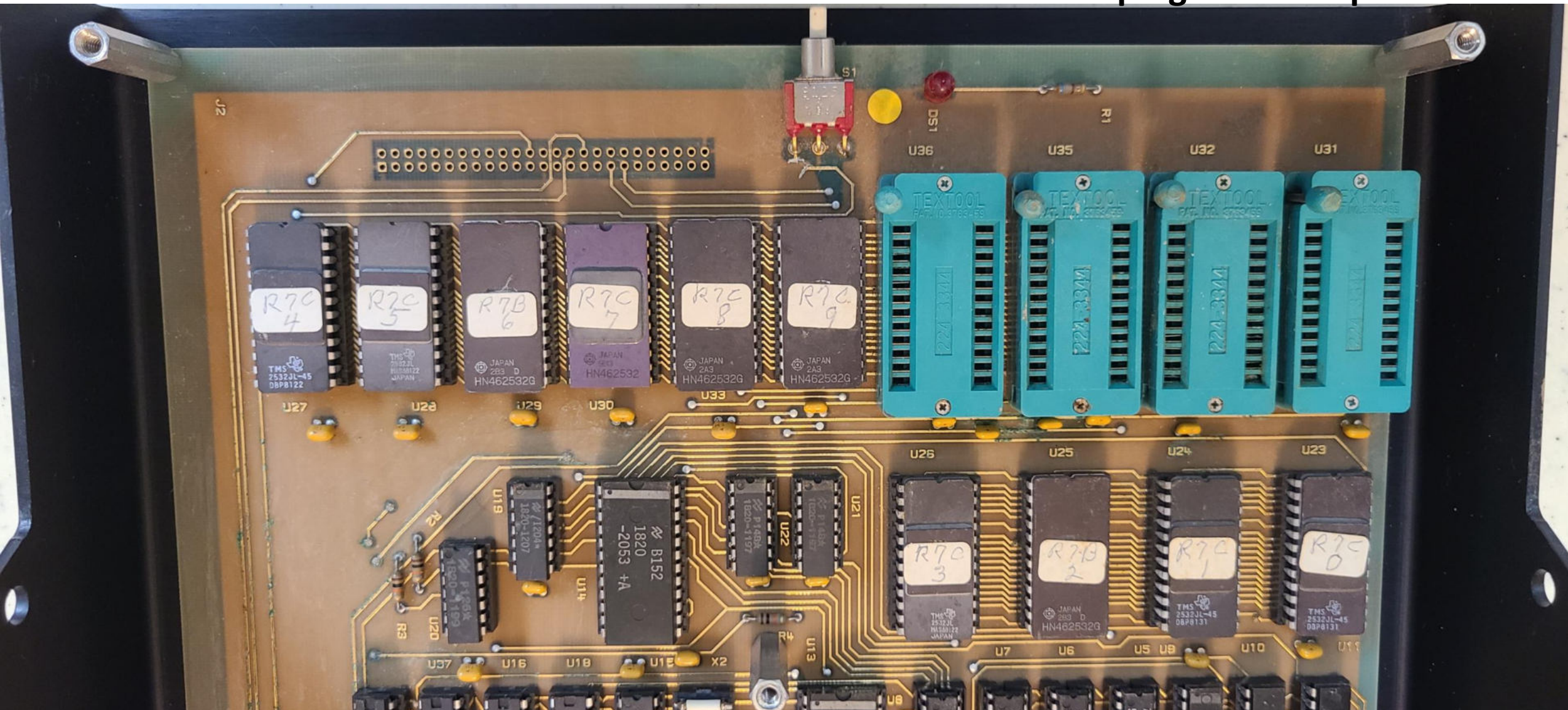
Back

Front

Zooming in on back of PCB...

Back

ZIF sockets for plug-in ROM Eproms and ...

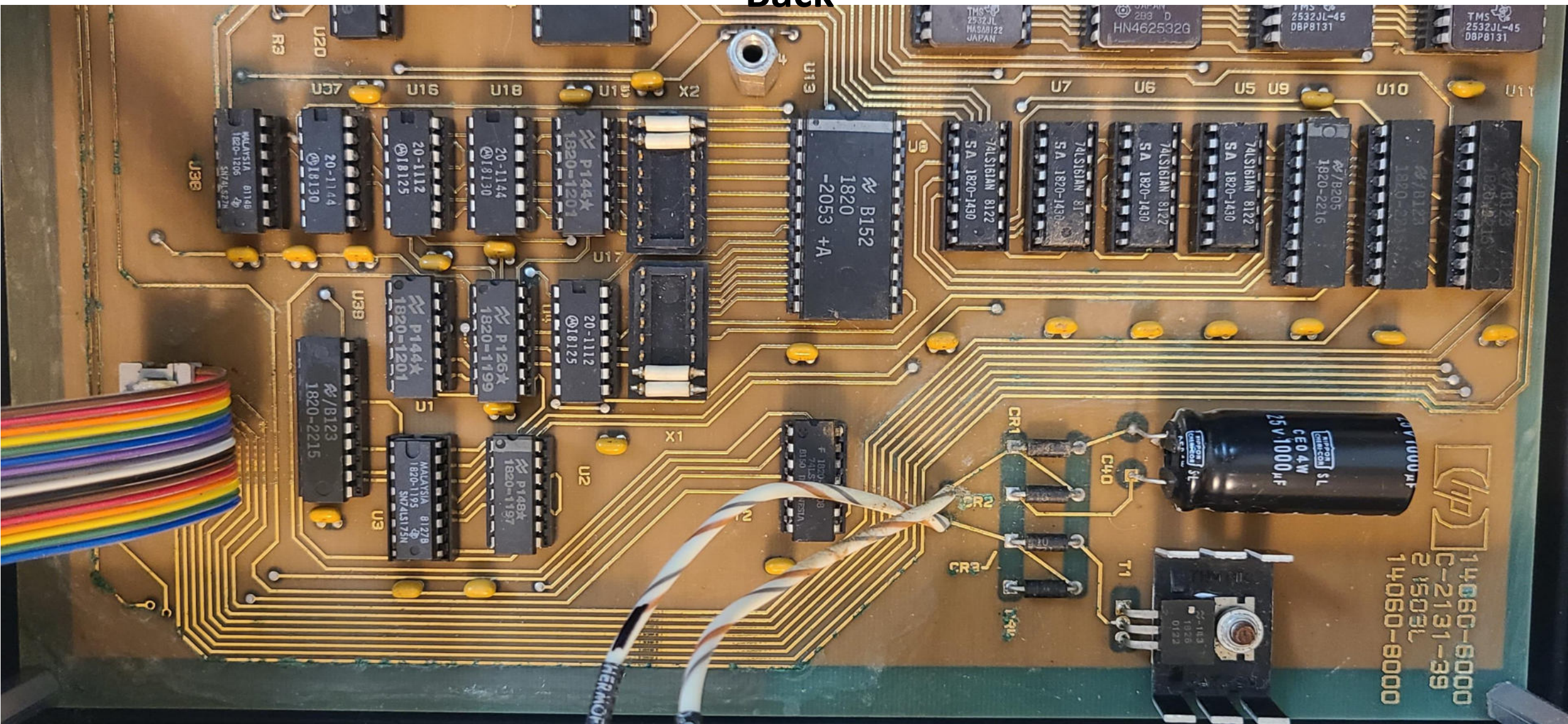


Front

System ROM EPROMS in sockets—
the HP75 does not have ROMS inside

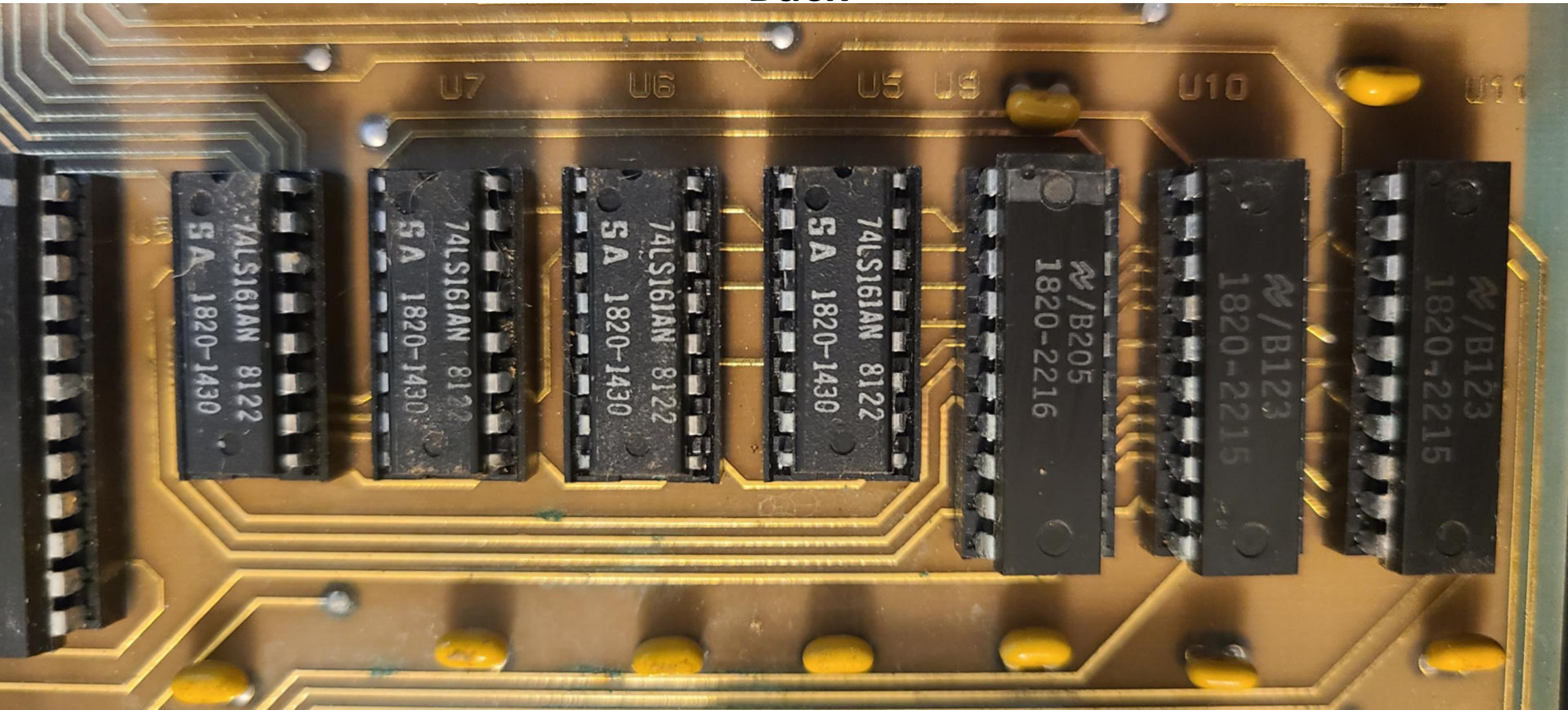
20

Back



Front

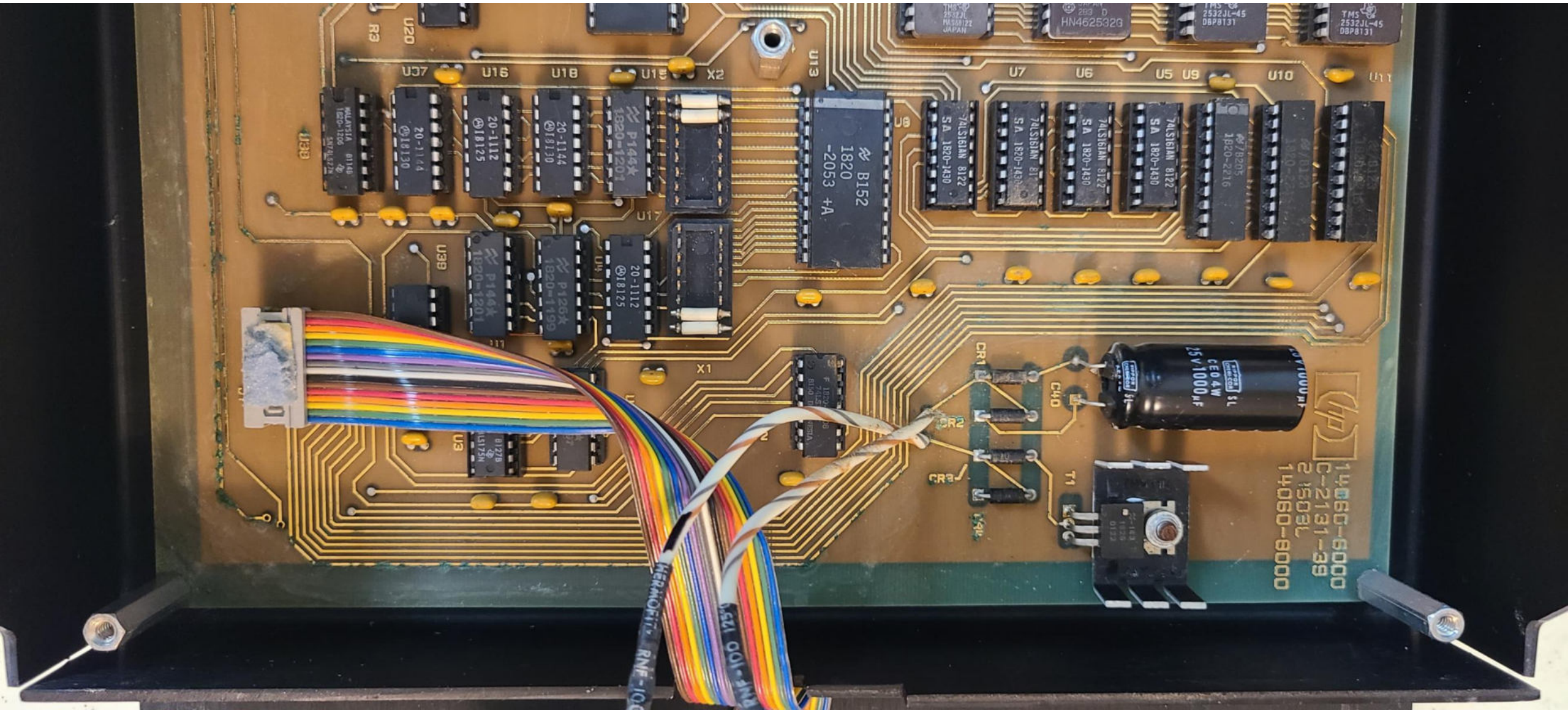
Back



Front

[illegible]

40th Anniversary
HPCC
22, 23 Oct 2022



PCB IC Components

PCB label	HP Part #	Part Label	Look-up
U1	1820-1201	Nat'l P144	SN74LS08N
U2	1820-1197	Nat'l P148	SN74LSOON
U3	1820-1195	74ls175n	SN74LS175N
U4	1820-1199	Nat'l P126	SN74LSOhN
U5	1820-1430	74LS161AN	SN74LS161AN
U6	1820-1430	74LS161AN	SN74LS161AN
U7	1820-1430	74LS161AN	SN74LS161AN
U8	1820-1430	74LS161AN	SN74LS161AN
U9	1820-2215	Nat'l B123	MM74C373N
U10	1820-2215	Nat'l B123	MM74C373N
U11	1820-2215	Nat'l B123	MM74C373N
U12	1820-1208	74ls32pc	SN74LS32N
U13	1820-2053	Nat'l B152	DM74LS154N
U14	1820-2053	Nat'l B152	DM74LS154N
U15	1820-1201	Nat'l P144	SN74LS08N
U16	1820-1112	Motl8125	SN74LS74AN
U17	1820-1112	Motl8125	SN74LS74AN
U18	1820-1144	Motl8130	SN74LS02N
U19	1820-1207	Nat'l I204	SN74LS30N
U20	1820-1199	Nat'l P126	SN74LSOhN

PCB label	HP Part #	Part Label	Look-up
U21	1820-1197	Nat'l P148	SN74LSOON
U22	1820-1197	Nat'l P148	SN74LSOON
U23	PROM	HN462532G	tms 2532jl-45
U24	PROM	HN462532G	
U25	PROM	HN462532G	
U26	PROM	HN462532G	
U27	PROM	HN462532G	
U28	PROM	HN462532G	
U29	PROM	HN462532G	
U30	PROM	HN462532G	
U31	Prom socket		
U32	Prom socket		
U33	PROM	HN462532G	
U34	PROM	HN462532G	
U35	Prom socket		
U36	Prom socket		
U37	1820-1144	Motl8130	SN74LS02N
U38	1820-1206	74ls27N	SN74LS27N
U39	1820-2215	Nat'l B123	MM74C373N

- HP part number reference list:

http://hparchive.com/Bench_Briefs/HP-Bench-Briefs-1987-10-12.pdf

Digital-to-Analog (DAC) Conversion

When a number is expressed in binary or binary-coded decimal and an analog voltage is to be produced to represent the number, the most practical way to perform this conversion is to add the currents having values proportional to the weights of the binary bits. Figure 1 represents a simplified binary weighted D/A converter. Switches S1 to SN represent the binary bits and connect either to ground or a reference voltage. Figure 1 shows switch S1 connecting R to the reference voltage and all other switches connected to ground; but since point A is a virtual ground, there is no current through 2R, 4R, up to 2N-1R. The amplifier has, therefore, a gain of $-\frac{5K}{10K} = -0.5$. If the reference voltage is -16V, the output voltages will be: R = 8V, 2R = 4V, 4R = 2V and for 8R = 1V. If S1 and S2 connect to the reference (the other switches to ground), the gain is $-\frac{5K}{6.66K} = -0.75$ and the output voltage 12V. The output is inversely proportional to the value of R.

The disadvantage of the circuit is high-value resistors representing low-weight bits. A better solution is a ladder configuration for groups of four bits as shown in Figure 2. Between each group of four resistors that represent weights of 1-2-4-8, there is a resistor that reduces the gain of the amplifier by 16 for binary and by 10 for BCD weights. This eliminates the need for high value resistors.

The D/A conversion is further simplified with the ladder circuit shown in Figure 3. Note that only values R and 2R are required.

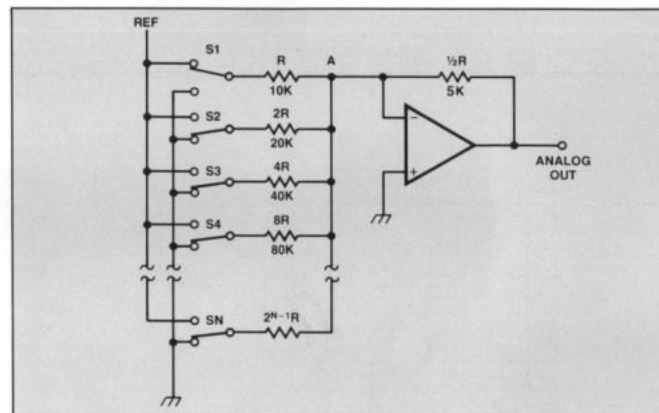


Figure 1. Simplified DAC

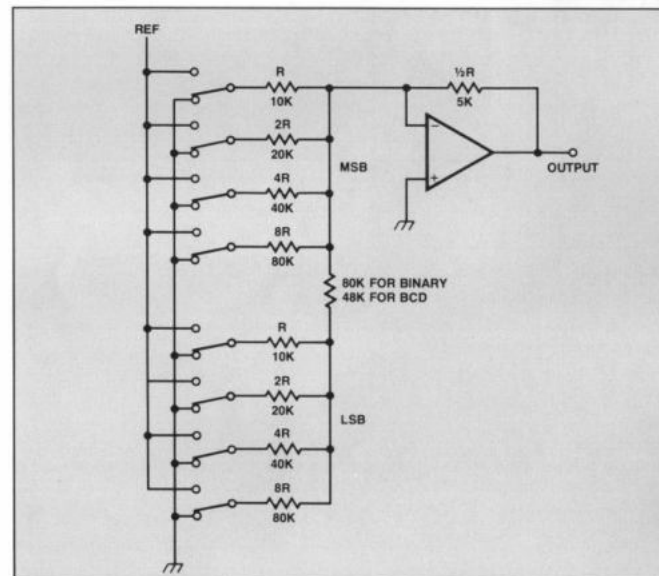


Figure 2. Ladder configuration DAC

Replacement Part Cross Reference

When selecting replacement parts for your HP products, you may notice that many manuals list only an HP part number for the part, even though it appears that this part is manufactured by one of the large semiconductor manufacturers. Service personnel often ask why only HP part numbers are listed.

It is recommended that HP replacement parts be used to ensure that the original performance of the product will be obtained. While some parts used in HP instruments are identical to that which can be purchased at a local electronics distributor, many times parts will be selected for certain characteristics, such as gain, bandwidth, capacitance, etc. There may also be slight mechanical differences, such as the shaping or length of leads, and in

some cases special quality checks are employed to ensure that only the highest reliability parts are used.

Therefore, we suggest obtaining replacement parts from HP to maintain the quality that you have paid for in your instrument. There may be situations however, where HP replacement parts are not in stock and substituting parts will allow you to return the product to service immediately. In these cases it may be worthwhile to see if a substitute part will work in the circuit. Perhaps an HP part could be ordered and installed at some later date.

To help you in these situations, here is a cross-reference of HP integrated circuit part numbers to manufacturers "generic type" part numbers (whom in most cases is the originator

of the part). Even though the cross-reference only lists one manufacturer, there may actually be several approved sources for an HP part. While every attempt was made to ensure the accuracy of the list, it is advisable to compare the description of the device being replaced with the description of the substituted part. For example, if the service manual describes the device being replaced as a "dual J-K flip-flop", check this against the description of the replacement part.

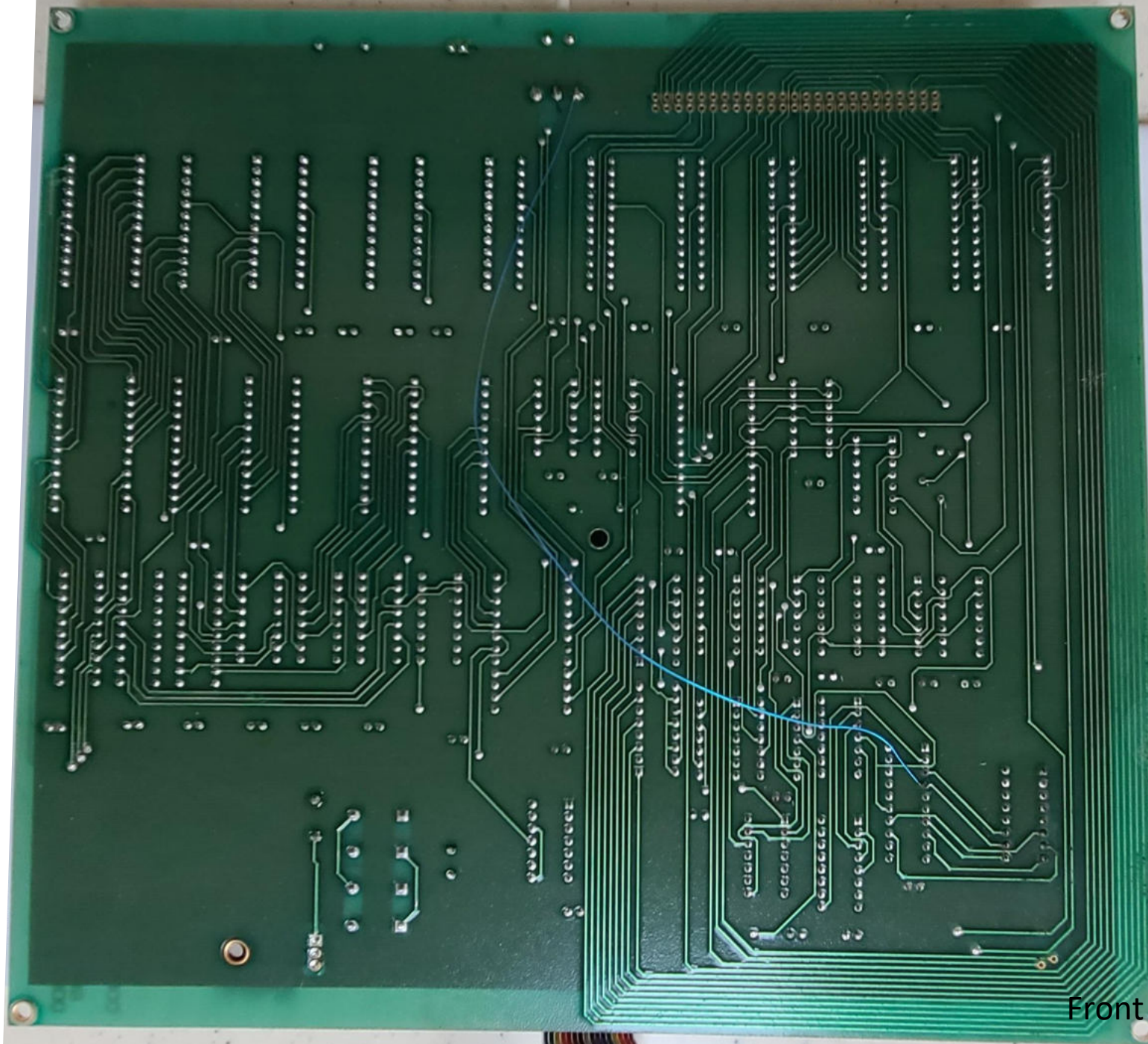
NOTE

This is not a comprehensive list. If the part number you are looking for is not listed here, the semiconductor is made exclusively for Hewlett-Packard and there is no substitute—it must be replaced with the same HP part number.

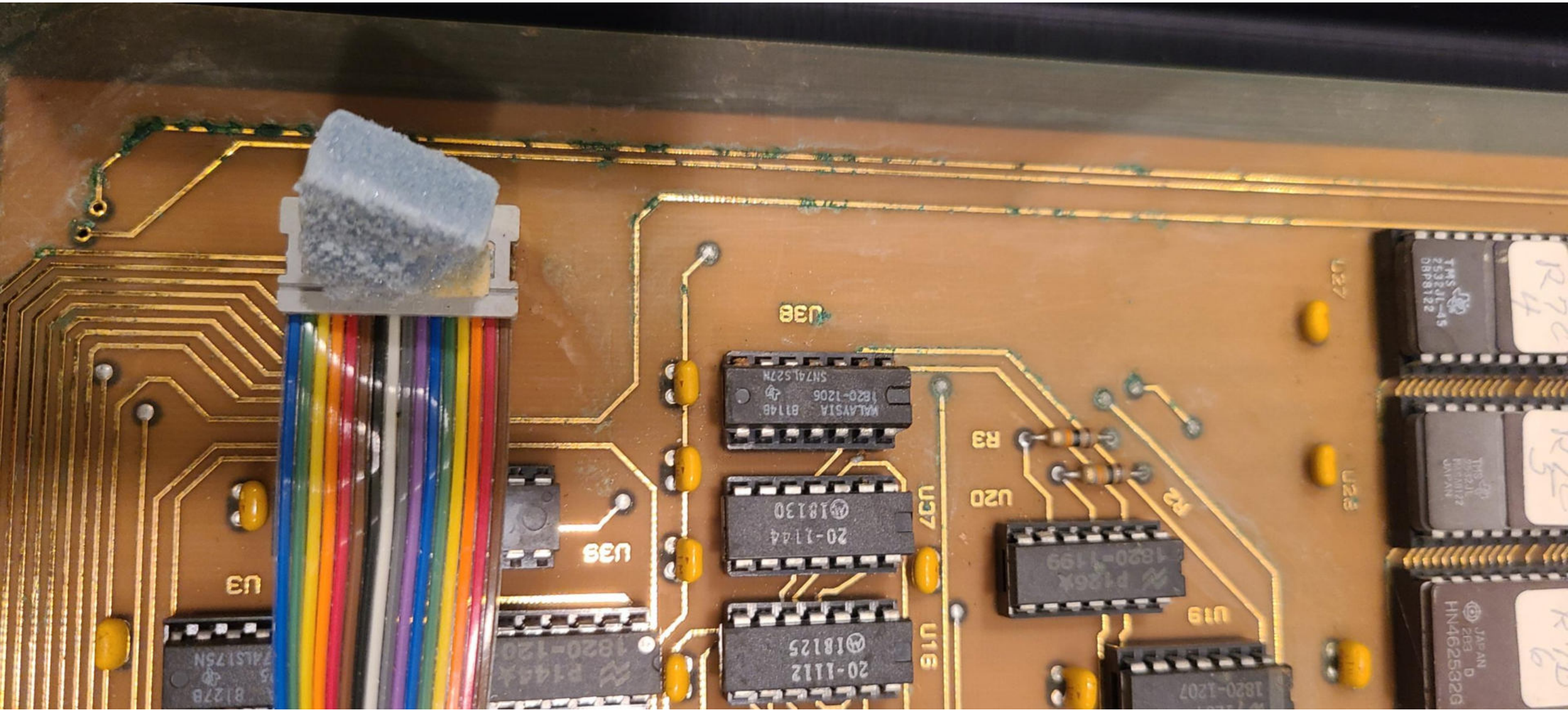
Manufacturers Code Number Cross Reference

No.	Manufacturer	No.	Manufacturer	No.	Manufacturer
00039	REC ELECTRONICS INC	05017	MIN VIEW	05017	REC ELECTRONICS INC
00046	UNITECH CORP	05046	MA US 021739871	05046	UNITECH CORP
00050	EXAR INTEGRATED SYSTEMS INC	05050	SUNNYVALE	05050	EXAR INTEGRATED SYSTEMS INC
00075	WESTERN DIGITAL CORP	05075	NEWPORT BEACH	05075	WESTERN DIGITAL CORP
01425	STANDARD MICROSYSTEMS CORP	01425	HAIRFAIR	01425	STANDARD MICROSYSTEMS CORP
01542	HP DIV 01 QED	01542	SAN JOSE	01542	HP DIV 01 QED
01590	FLEISCHER SEMICONDUCTORS	01590	SANTA ANA	01590	FLEISCHER SEMICONDUCTORS
01608	TEXAS INSTRUMENTS INC	01608	DALLAS	01608	TEXAS INSTRUMENTS INC
01876	HP DIV 02 300 1C'S	01876	SANTA CLARA	01876	HP DIV 02 300 1C'S
01921	RCA CORP	01921	NEW YORK	01921	RCA CORP
01973	GE CO SEMICONDUCTOR PROD DEPT	01973	ALBANY	01973	GE CO SEMICONDUCTOR PROD DEPT
01991	TRANSITION ELECTRONIC CORP	01991	MASSACHUSETTS	01991	TRANSITION ELECTRONIC CORP
02023	TRW SWITCHES	02023	CHICAGO	02023	TRW SWITCHES
02037	ROGERS INC	02037	ROSELLE	02037	ROGERS INC
02180	PRECISION MONOLITHICS INC	02180	SANTA CLARA	02180	PRECISION MONOLITHICS INC
02217	FAIRCHILD SEMICONDUCTOR CORP	02217	SUNNYVALE	02217	FAIRCHILD SEMICONDUCTOR CORP
02290	RAYTHEON CO SEMICONDUCTOR DIV HQ	02290	WATERTOWN	02290	RAYTHEON CO SEMICONDUCTOR DIV HQ
02548	UNITECH CORP	02548	WATERTOWN	02548	UNITECH CORP
02686	WATKINS-JOHNSON CO	02686	PALO ALTO	02686	WATKINS-JOHNSON CO
02713	GENERAL INSTRUMENT CORP (DIODE)	02713	BIRMINGHAM	02713	GENERAL INSTRUMENT CORP (DIODE)
02763	TELETYPE SEMICONDUCTOR	02763	HOUSTON	02763	TELETYPE SEMICONDUCTOR
02838	DYNAMIC MEASUREMENTS CORP	02838	WINCHESTER	02838	DYNAMIC MEASUREMENTS CORP
02882	TELTEL INC SUB OF RECOR CORP	02882	CONCORD	02882	TELTEL INC SUB OF RECOR CORP
02883	SILICONIX INC	02883	SANTA CLARA	02883	SILICONIX INC
02910	SIMONDS CORP	02910	SUNNYVALE	02910	SIMONDS CORP
02928	ANALOG DEVICES INC	02928	NORWOOD	02928	ANALOG DEVICES INC
03120	AVANTIC INC	03120	SANTA CLARA	03120	AVANTIC INC
03166	NATIONAL SEMICONDUCTOR CORP	03166	SANTA CLARA	03166	NATIONAL SEMICONDUCTOR CORP
03545	TELETYPE PULLBACK REEDS	03545	DESHAM	03545	TELETYPE PULLBACK REEDS
03677	AMERICAN MICRO SYSTEMS INC	03677	SANTA CLARA	03677	AMERICAN MICRO SYSTEMS INC
03688	ANALOGIC CORP	03688	MASSACHUSETTS	03688	ANALOGIC CORP
03714	INTERTELL INC	03714	BURLINGTON	03714	INTERTELL INC
03755	HYTRIS SYSTEMS CORP	03755	SANTA CLARA	03755	HYTRIS SYSTEMS CORP
03780	INTECH INC	03780	SANTA CLARA	03780	INTECH INC
03793	SILICON GENERAL INC	03793	SAN JOSE	03793	SILICON GENERAL INC
03795	ADVANCED MICRO DEVICES INC	03795	SUNNYVALE	03795	ADVANCED MICRO DEVICES INC
03799	HARRIS CORP	03799	MELROSE	03799	HARRIS CORP
03811	INTEL CORP	03811	SANTA CLARA	03811	INTEL CORP
03947	ACE CORP	03947	DARTON	03947	ACE CORP
04077	CEMTECH INC DIV REPUBLIC CORP	04077	HOUSTON	04077	CEMTECH INC DIV REPUBLIC CORP
04078	ROSTEN CORP	04078	CARROLLTON	04078	ROSTEN CORP
04092	MONOLITHIC MEMORIES INC	04092	SANTA CLARA	04092	MONOLITHIC MEMORIES INC
04200	EPHRAIM ELECTRIC CO	04200	LEXINGTON	04200	EPHRAIM ELECTRIC CO
05007	TW INC	05007	CLEVELAND	05007	TW INC
05436	BURK-BROWN CORP	05436	TUCSON	05436	BURK-BROWN CORP
05542	ROHMTELL INC	05542	MINNEAPOLIS	05542	ROHMTELL INC
05546	MIN VIEW	05546	MA US 021739871	05546	MIN VIEW
05546	SUNNYVALE	05546	CA 940852061	05546	SUNNYVALE
05546	NEWPORT BEACH	05546	CA 9262652840	05546	NEWPORT BEACH
05546	HAIRFAIR	05546	NY 051312840	05546	HAIRFAIR
05546	SAN JOSE	05546	CA 951312840	05546	SAN JOSE
05546	SANTA ANA	05546	CA 9270552448	05546	SANTA ANA
05546	DALLAS	05546	TX 7526501295	05546	DALLAS
05546	SANTA CLARA	05546	CA US 950502840	05546	SANTA CLARA
05546	NEW YORK	05546	NY 1011231585	05546	NEW YORK
05546	ALBANY	05546	NY 1320133508	05546	ALBANY
05546	MASSACHUSETTS	05546	MA 0188024646	05546	MASSACHUSETTS
05546	CHICAGO	05546	IL 6063104426	05546	CHICAGO
05546	ROSELLE	05546	IL 6019504713	05546	ROSELLE
05546	SANTA CLARA	05546	CA US 9505406665	05546	SANTA CLARA
05546	SUNNYVALE	05546	CA US 9501407263	05546	SUNNYVALE
05546	WATERTOWN	05546	MA 0217212969	05546	WATERTOWN
05546	PALO ALTO	05546	CA US 9430414482	05546	PALO ALTO
05546	BIRMINGHAM	05546	AL 3521148136	05546	BIRMINGHAM
05546	HOUSTON	05546	TX 7705115818	05546	HOUSTON
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05546	NORWOOD	05546	MA US 0206624355	05546	NORWOOD
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05546	SAN JOSE	05546	CA US 9513434333	05546	SAN JOSE
05546	SUNNYVALE	05546	CA US 9408618154	05546	SUNNYVALE
05546	MELROSE	05546	FL 3290134371	05546	MELROSE
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05546	LEXINGTON	05546	MA US 0217356299	05546	LEXINGTON
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05546	SANTA CLARA	05546	CA US 9505131471	05546	SANTA CLARA
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05546	BURLINGTON	05546	MA 0180313256	05546	BURLINGTON
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05546	HOUSTON	05546	TX 7705050088	05546	HOUSTON
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05546	MA US 021739871	05546	MA US 021739871	05546	MA US 021739871
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05546	NEWPORT BEACH	05546	CA 9262652840	05546	NEWPORT BEACH
05546	HAIRFAIR	05546	NY 051312840	05546	HAIRFAIR
05546	SAN JOSE	05546	CA 951312840	05546	SAN JOSE
05546	SANTA ANA	05546	CA 9270552448	05546	SANTA ANA
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05546	SANTA CLARA	05546	CA US 9505406665	05546	SANTA CLARA
05546	SUNNYVALE	05546	CA US 9501407263	05546	SUNNYVALE
05546	WATERTOWN	05546	MA 0217212969	05546	WATERTOWN
05546	PALO ALTO	05546	CA US 9430414482	05546	PALO ALTO
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05546	WINCHESTER	05546	MA 0189017191	05546	WINCHESTER
05546	CONCORD	05546	CA 9452017850	05546	CONCORD
05546	SANTA CLARA	05546	CA US 9505417856	05546	SANTA CLARA
05546	SUNNYVALE	05546	CA US 9408618154	05546	SUNNYVALE
05546	NORWOOD	05546	MA US 0206624355	05546	NORWOOD
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05546	DESHAM	05546	MA 0205048137	05546	DESHAM
05546	SANTA CLARA	05546	CA US 9505131471	05546	SANTA CLARA
05546	MASSACHUSETTS	05546	MA 0188018184	05546	MASSACHUSETTS
05546	BURLINGTON	05546	MA 0180313256	05546	BURLINGTON
05546	SANTA CLARA	05546	CA US 9505033967	05546	SANTA CLARA
05546	SAN JOSE	05546	CA US 9513434333	05546	SAN JOSE
05546	SUNNYVALE	05546	CA US 9408618154	05546	SUNNYVALE
05546	MELROSE	05546	FL 3290134371	05546	MELROSE
05546	SANTA CLARA	05546	CA US 9505434449	05546	SANTA CLARA
05546	DARTON	05546	OH US 4547942470	05546	DARTON
05546	HOUSTON	05546	TX 7705050088	05546	HOUSTON
05546	SANTA CLARA	05546	CA US 9505450364	05546	SANTA CLARA
05546	LEXINGTON	05546	MA US 0217356299	05546	LEXINGTON
05546	CLEVELAND	05546	OH US 4414217195	05546	CLEVELAND
05546	TUCSON	05546	AZ US 857068175	05546	TUCSON
05546	MINNEAPOLIS	05546	MN US 5540891929	05546	MINNEAPOLIS
05546	MIN VIEW	05546	CA US 9404180545	05546	MIN VIEW
05546	MA US 021739871	05546	MA US 021739871	05546	MA US 021739871
05546	SUNNYVALE	05546	CA 940852061	05546	SUNNYVALE
05546	NEWPORT BEACH	05546	CA 9262652840	05546	NEWPORT BEACH
05546	HAIRFAIR	05546	NY 051312840	05546	HAIRFAIR
05546	SAN JOSE	05546	CA 951312840	05546	SAN JOSE
05546	SANTA ANA	05546	CA 9270552448	05546	SANTA ANA
05546	DALLAS	05546	TX 7526501295	05546	DALLAS
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05546	NEW YORK	05546	NY 1011231585	05546</	

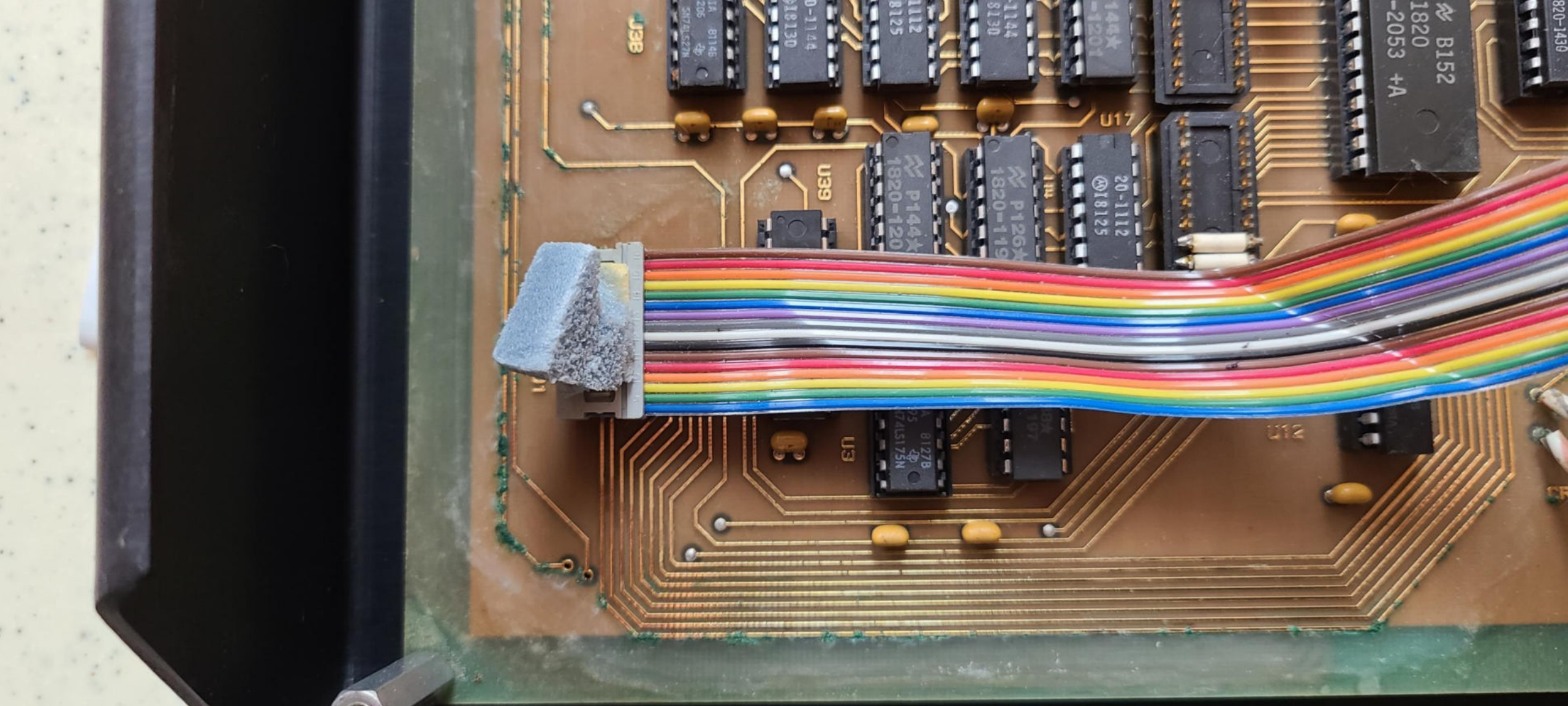
PCB Back-side



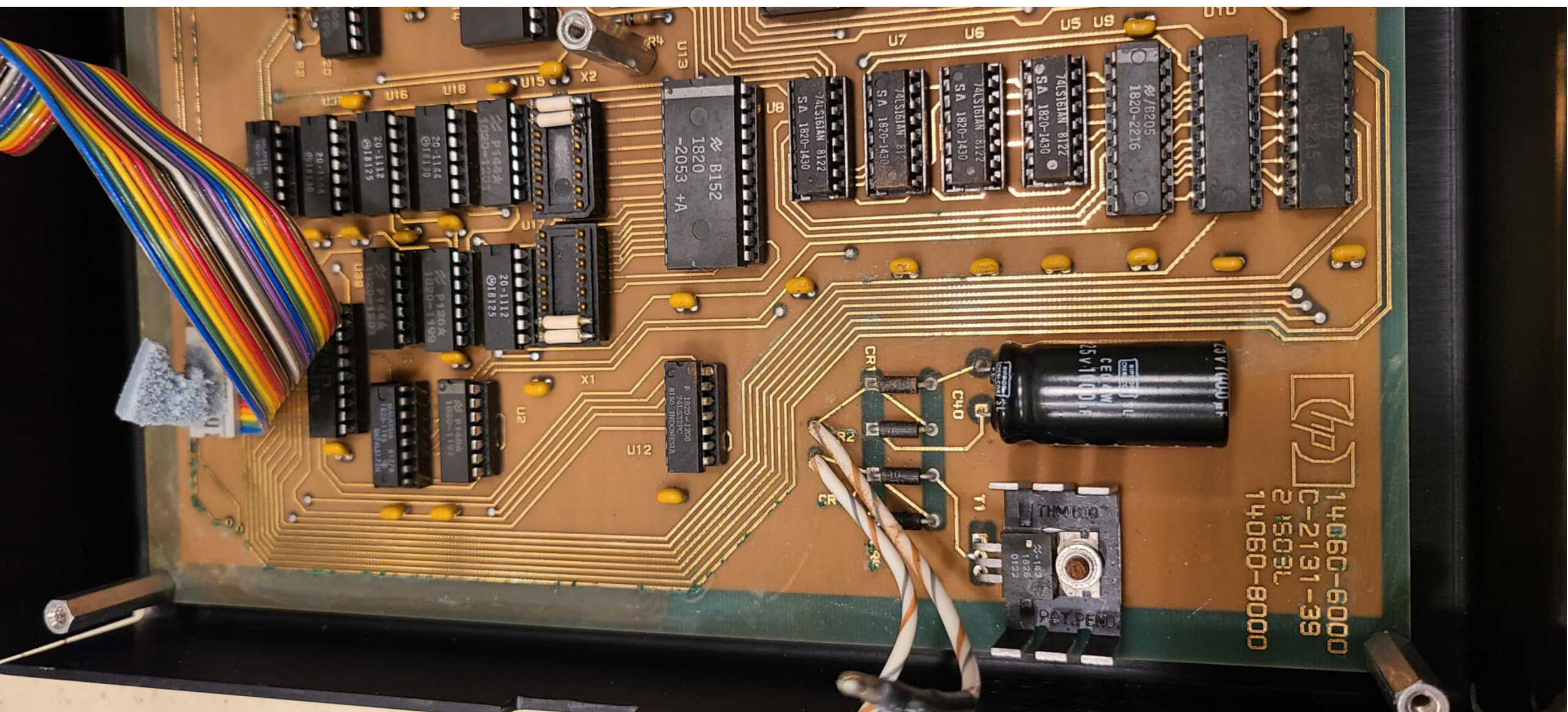
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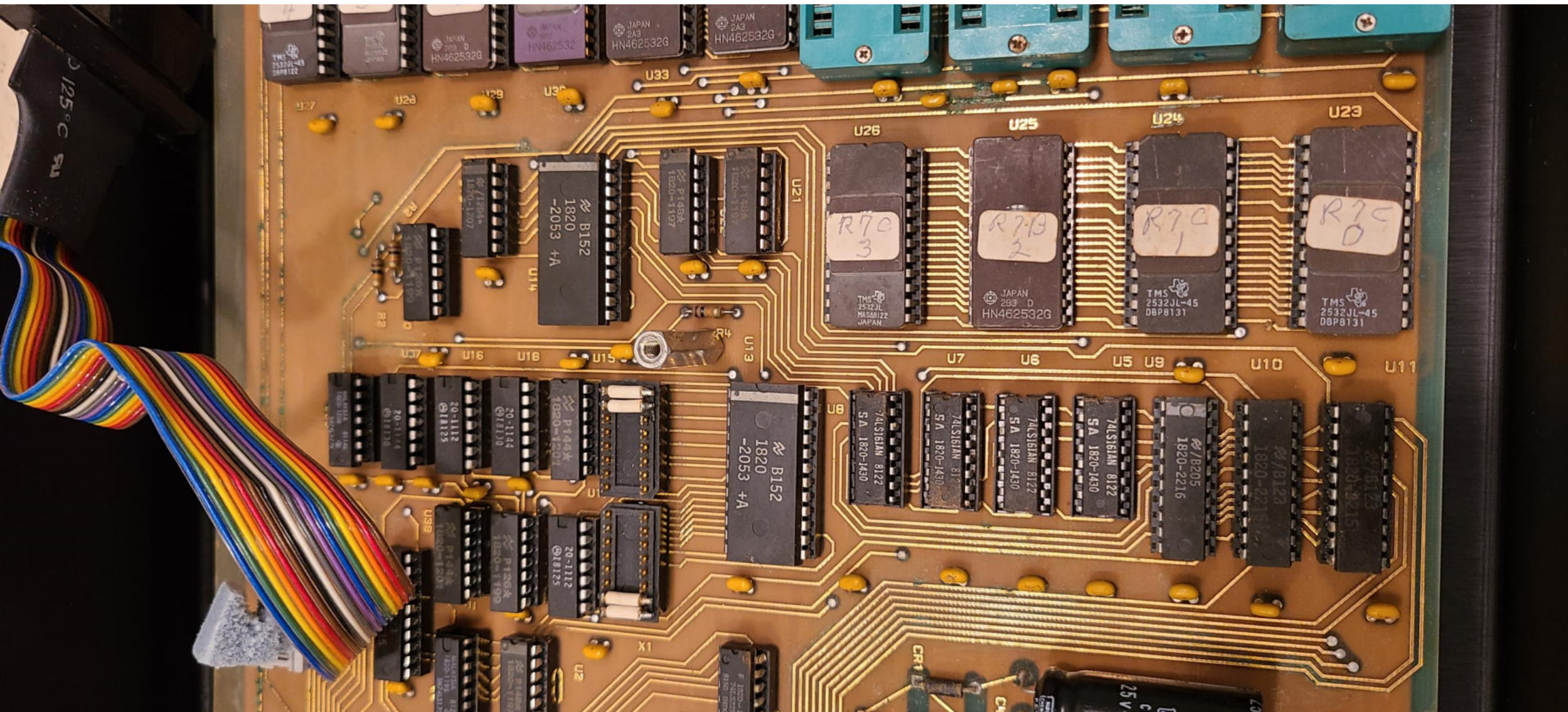


PCB Corrosion

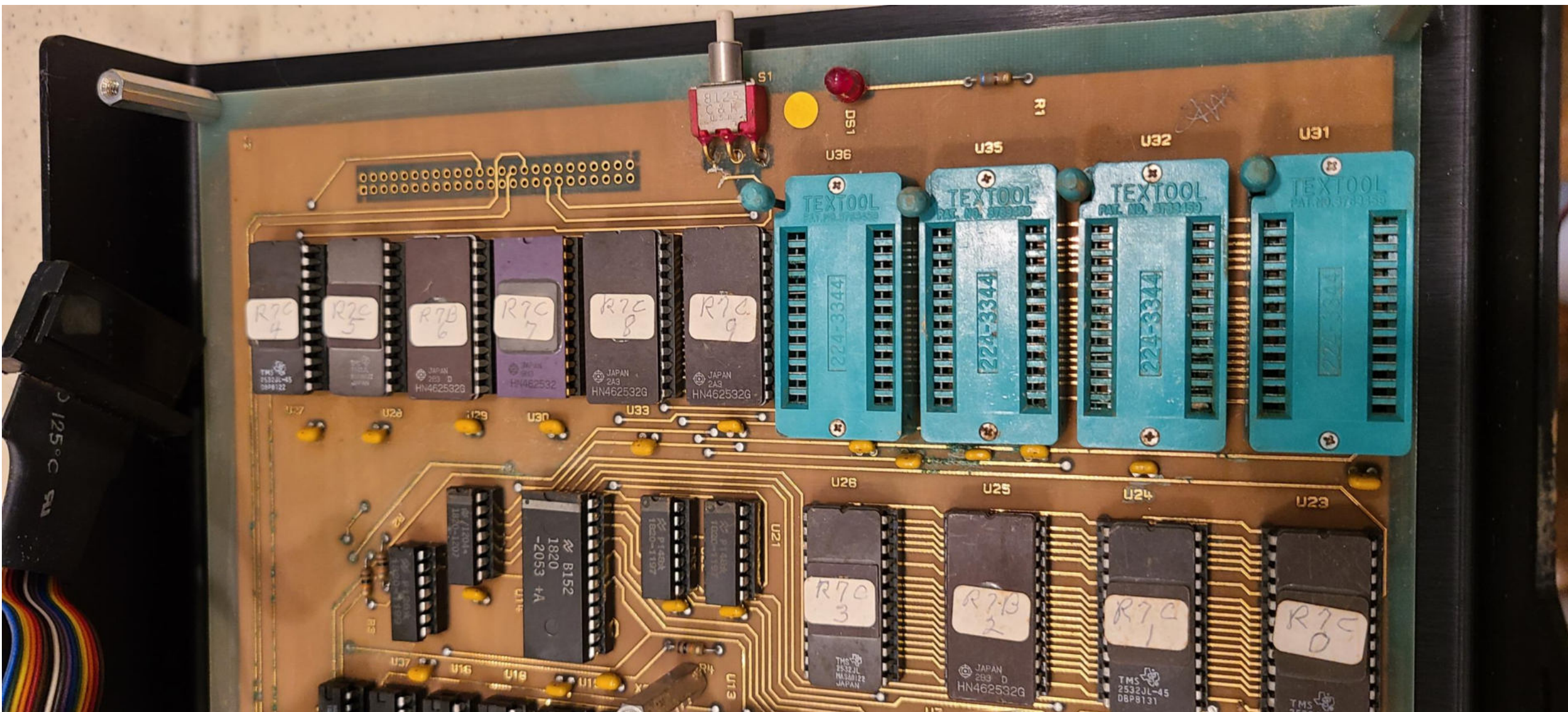


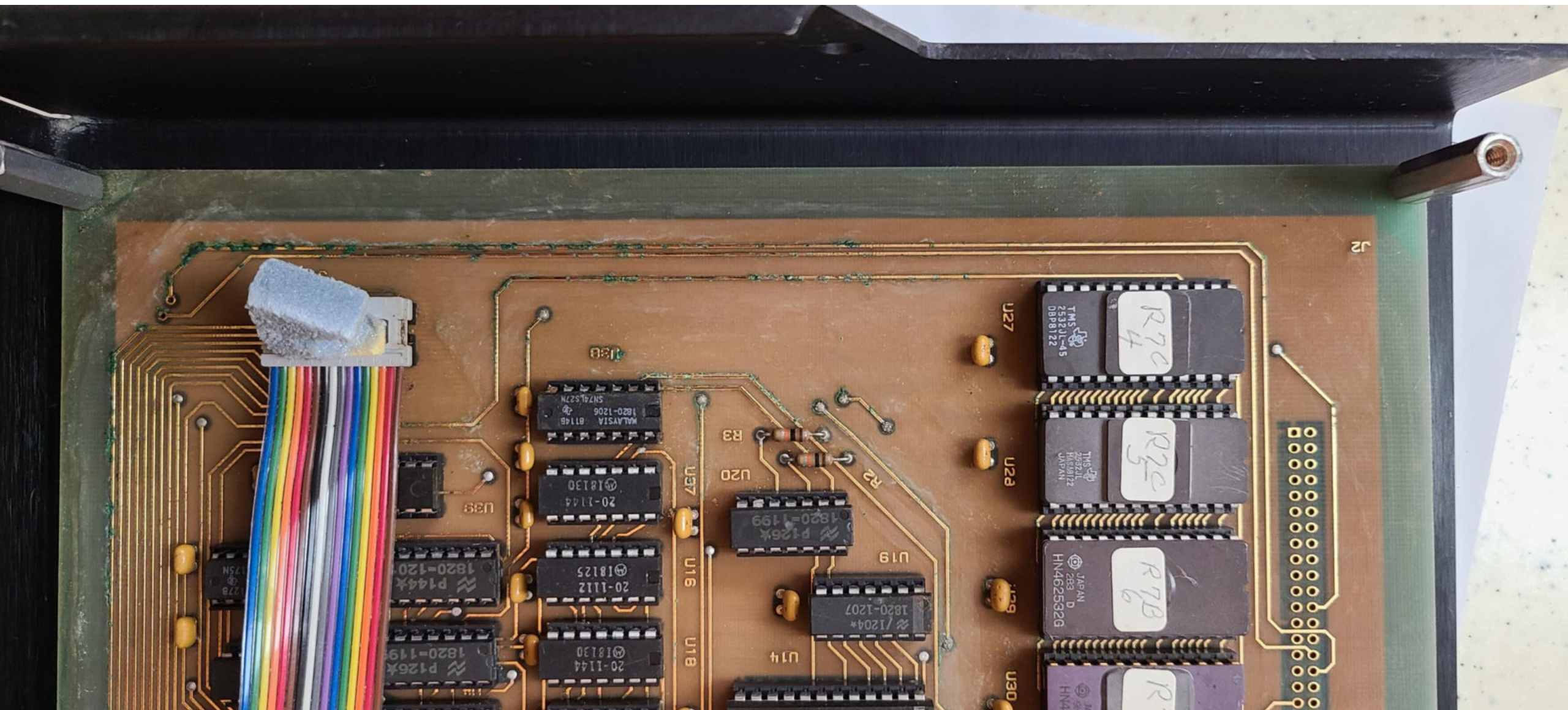
PCB Corrosion





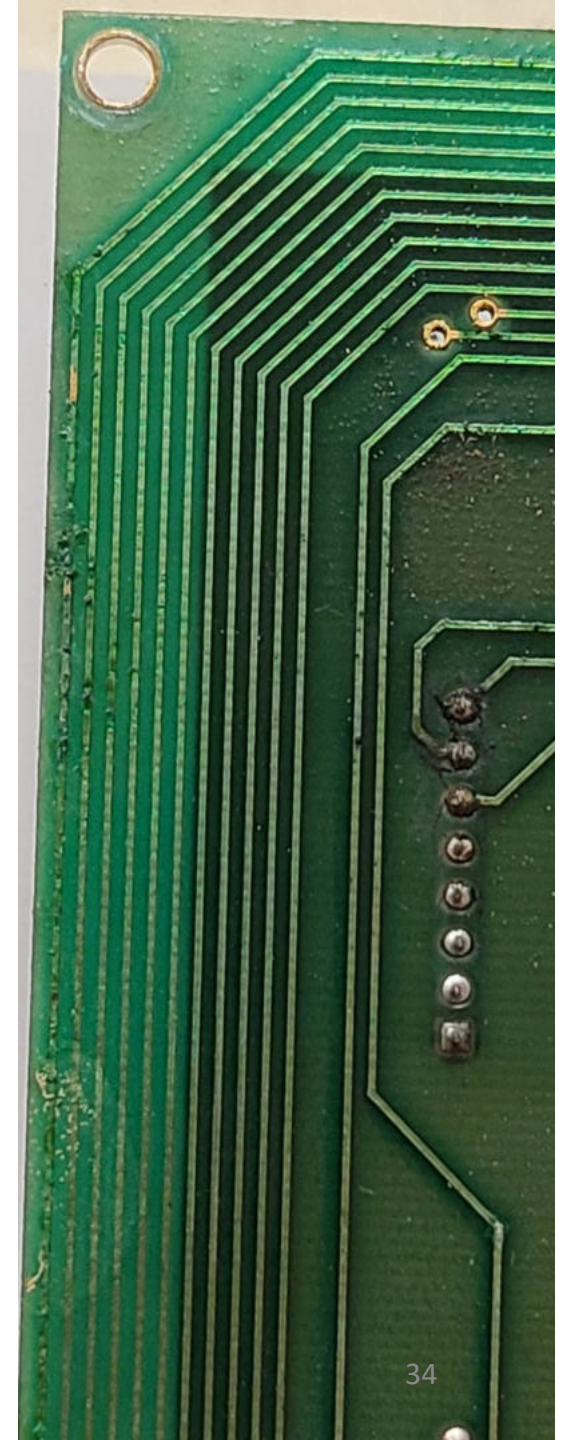
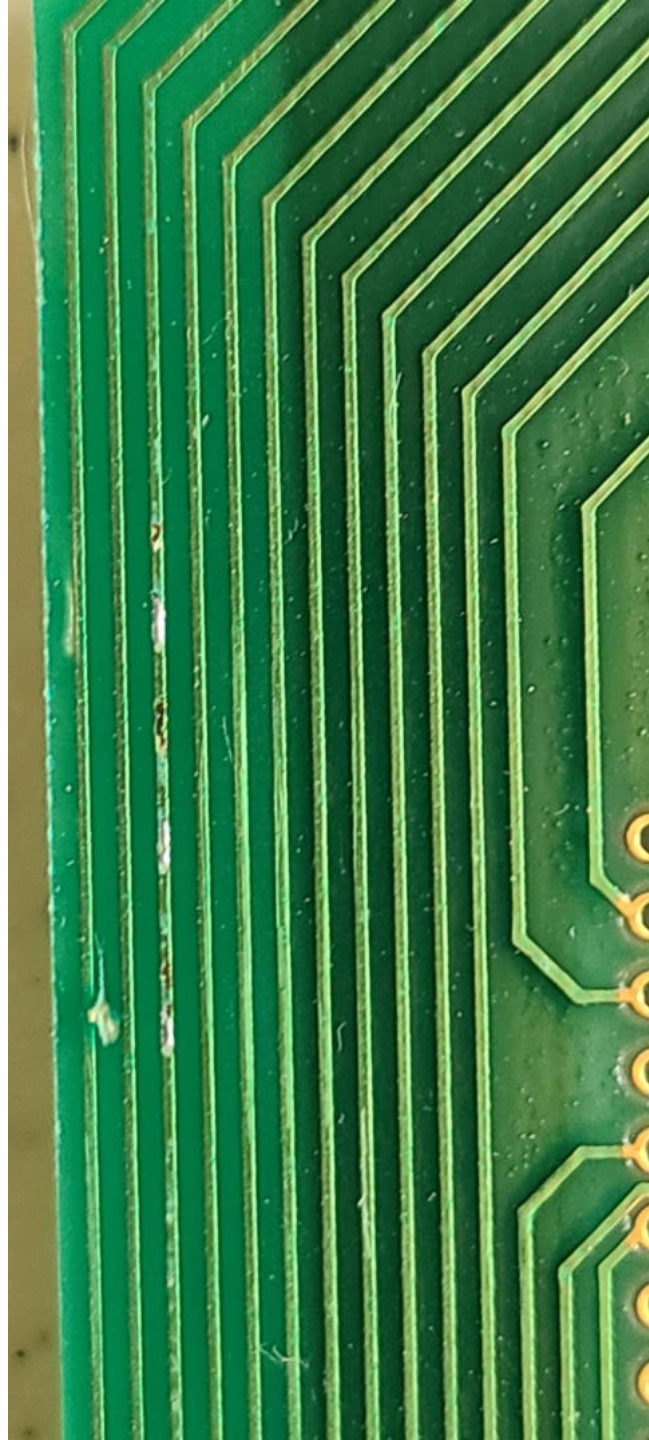
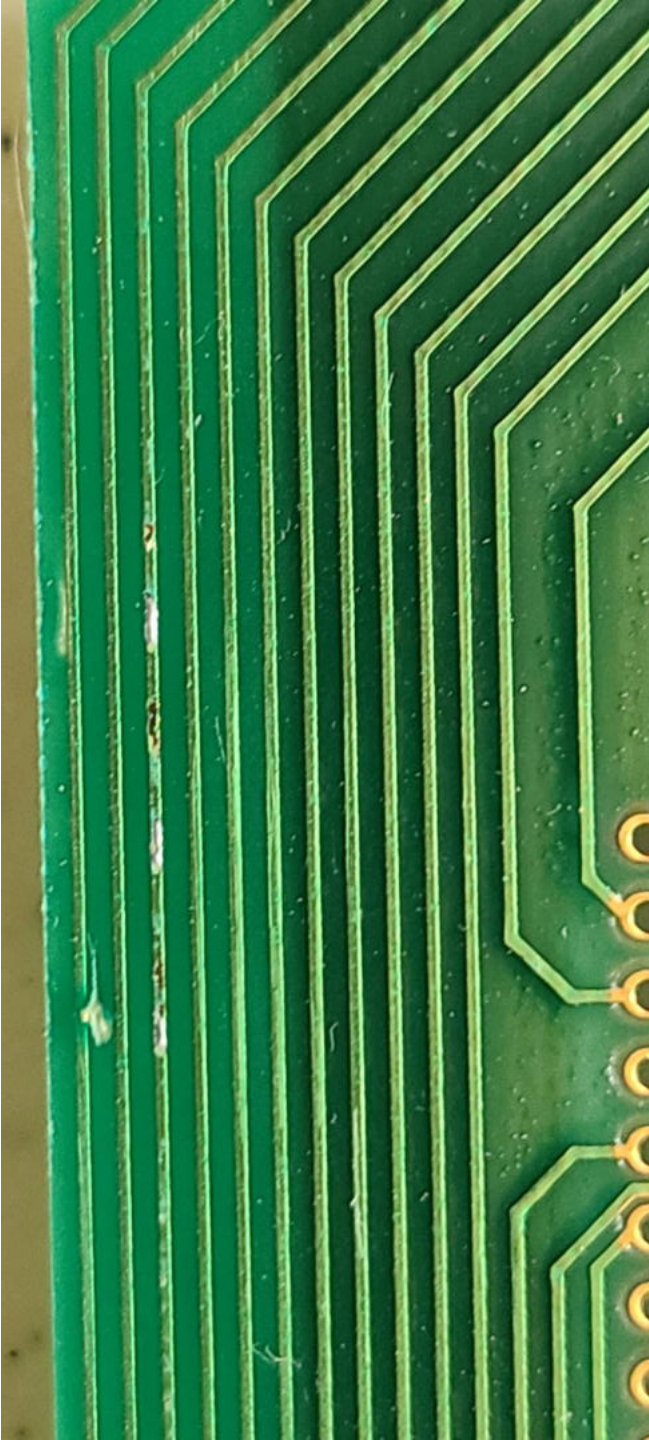
PCB Corrosion





PCB Corrosion

PCB Corrosion



.... Similar ...



Thank you!

40th Anniversary

HPCC

22, 23 Oct 2022