

# Weeskinderen in de shack

Reparaties aan (Meet-) apparatuur

# Inhoud

- 1. Aanleiding
- 2. Motivatie
- 3. Voorbereiding
- 4. Gereedschap
- 5. Geduld/Logisch denken
- 6. Resultaat

# Aanleiding

- Veel wat oudere (meet-) en amateur apparatuur met (kleine) mankementen
- Gemiddeld 30 à 40 jaar oud
- Wegdoen aan een ander of zelfs weggooien?
- NEE!!!
- Dus poging tot reparatie
- Niet bepaald mijn hobby!

# Motivatie

- Je moet er echt zin in hebben
- Omgaan met tegenslagen
- Tijd en geduld
- Wet van Murphy of –nog erger- wet van O'Toole (“Murphy was an optimist”)

# Vorbereiding

- Wat was het euvel ook al weer? Kan soms lang geleden zijn.
- Schema? Manual?
- Functionele beschrijving beschikbaar?
- Maak foto's vóór het demonteren
- Idem tekeningen van draadaansluitingen
- Noteer volgorde van demonteren
- Hou een Logboek bij

# Gereedschap

- Desoldeerlitze
- Desoldeerstation –luxe-
- Loupelamp
- Normale gereedschappen
- Soldeer van goede kwaliteit
- Regelbare voeding
- Meetapparatuur

# Geduld/ logisch denken

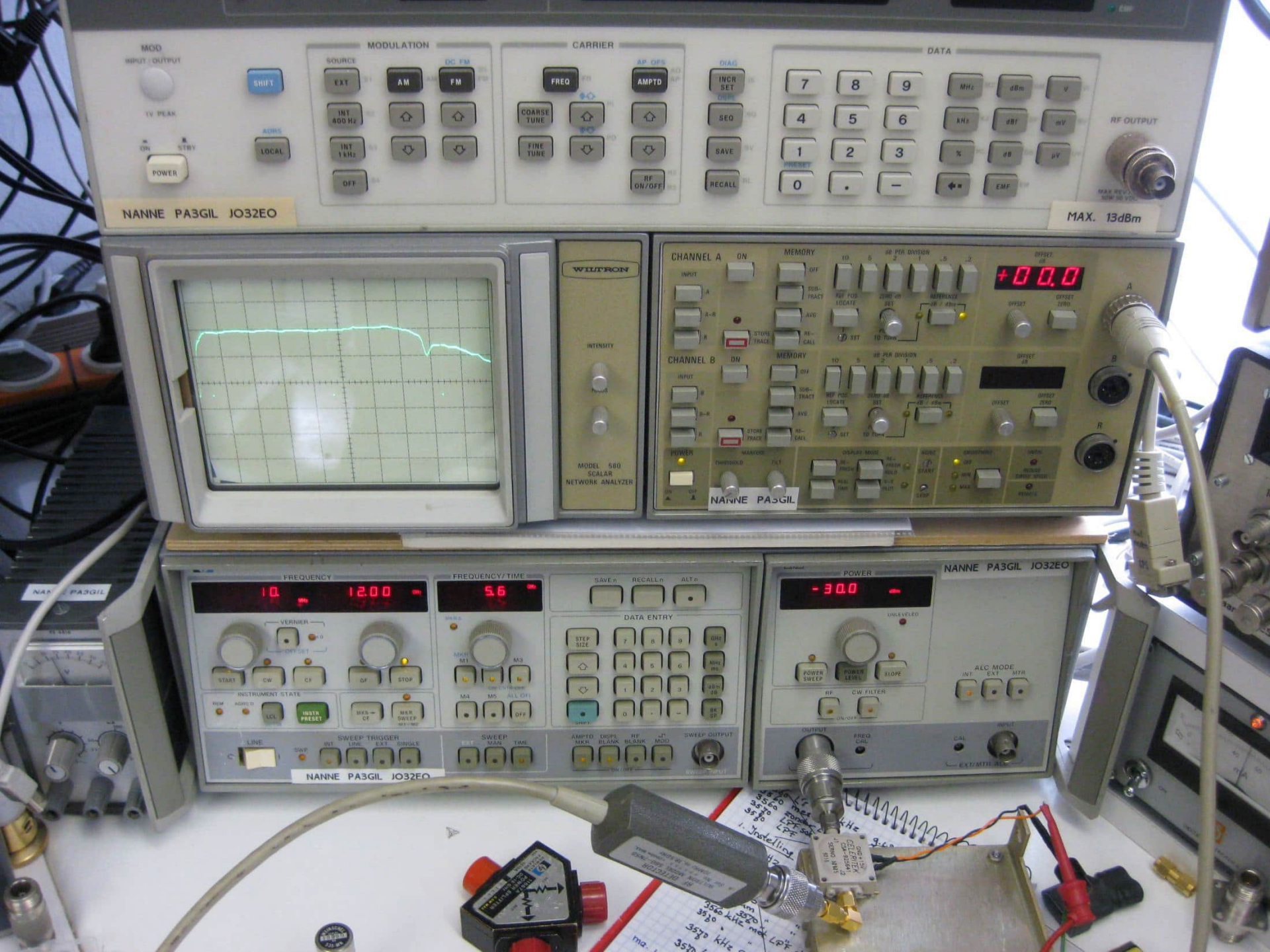
- Neem de tijd om de werking van het onderhanden toestel te doorgronden
- Wat kan er mis zijn?
- Niet elke ingang is de goede

# Resultaat

- Wiltron 560 Netwerk Analyzer
- NRD515 Amateur Ontvanger
- DS345 Functie Generator
- HF6-PAØSSB Transceiver

# Wilton 560

- Scalar Network Analyzer
- In feite logaritmische scoop
- Met detectors en Sweep Generator
- Meetplaats 10 MHz – 20 GHz
- Zekering “klapt” bij aanzetten



NANNE PA3GIL JO32EO

MAX. 13dBm

WILTRON

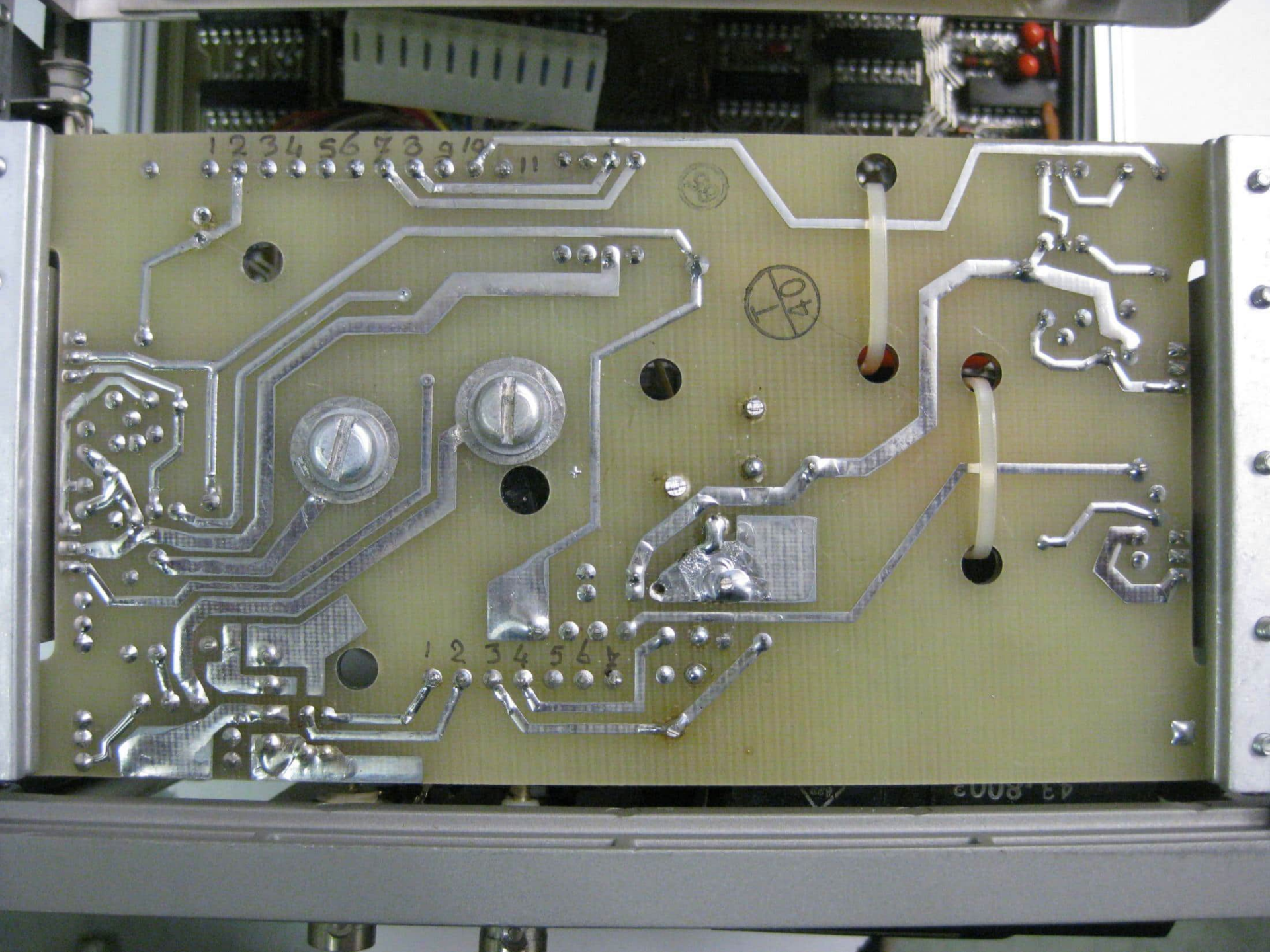
INTENSITY

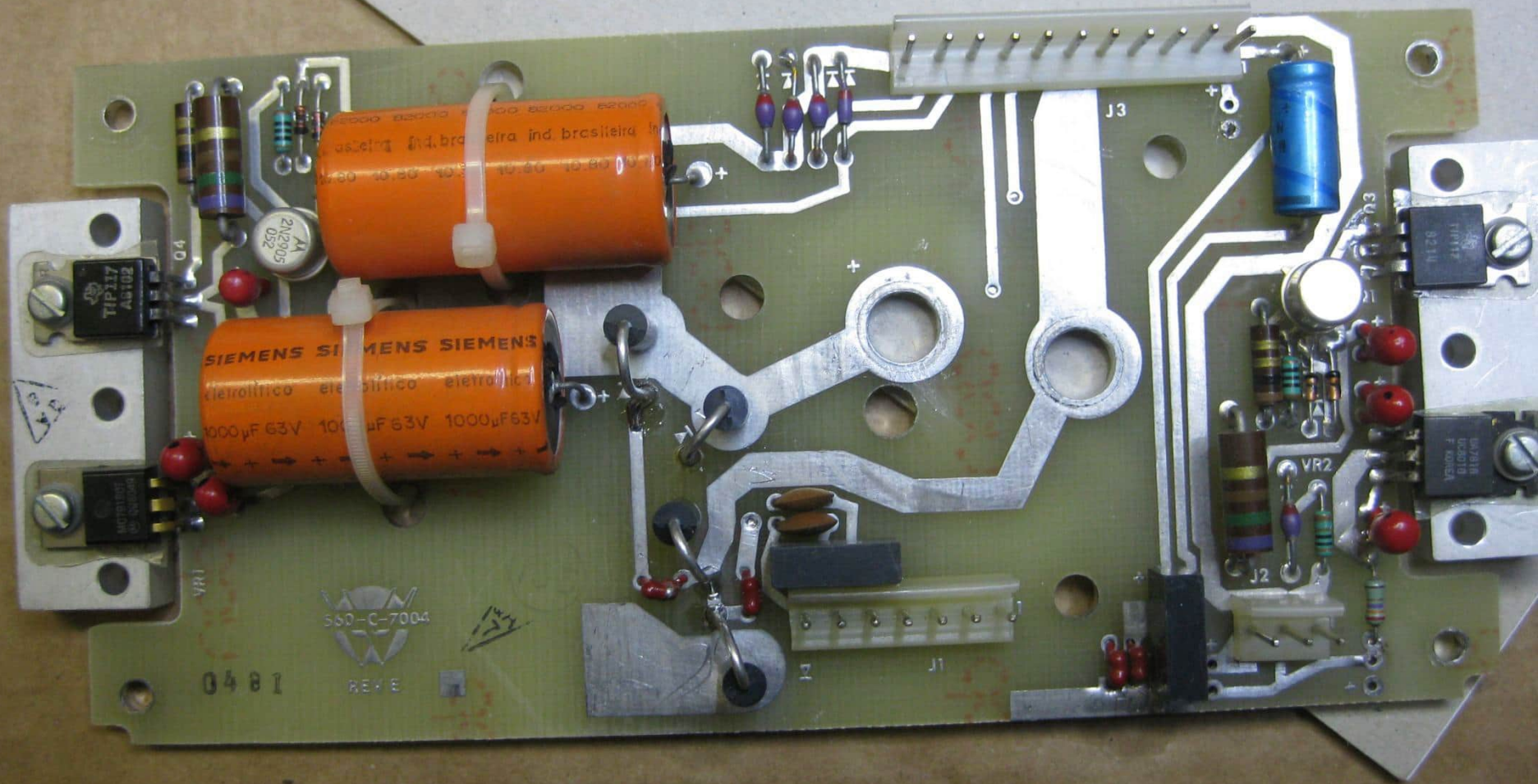
MODEL 580  
SCALAR  
NETWORK ANALYZER

NANNE PA3GIL

NANNE PA3GIL JO32EO

NANNE PA3GIL JO32EO





# JRC NRD-515

- All Band ontvanger 0.1 – 30 MHz
- Fraaie ontvanger
- Frequentie instelling met Afstemknop functioneert niet goed
- In bepaald bandgedeelte te veel verzwakking



NDH-518  
MEMORY UNIT



PRESET



CHANNEL



MEMORY

PRESET  
MANUAL



NRD-515  
ALL WAVE RECEIVER

EXT VFO

$\Delta F$

648.0  
MHz kHz

VFO



$\Delta F$



OFF

NB



OFF

MONITOR



ON  
OFF

ATT



10dB  
OFF  
20dB

POWER



OFF



MHz



PHONES

BFO & BC TUNE



RF GAIN



TUNE



UP  
DOWN

LOCK

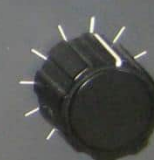
$\Delta F$



AF GAIN



PBT



AGC  
FAST  
SLOW



BANDWIDTH (kHz)



MODE

USB  
LSB  
AM  
RTTY  
CW



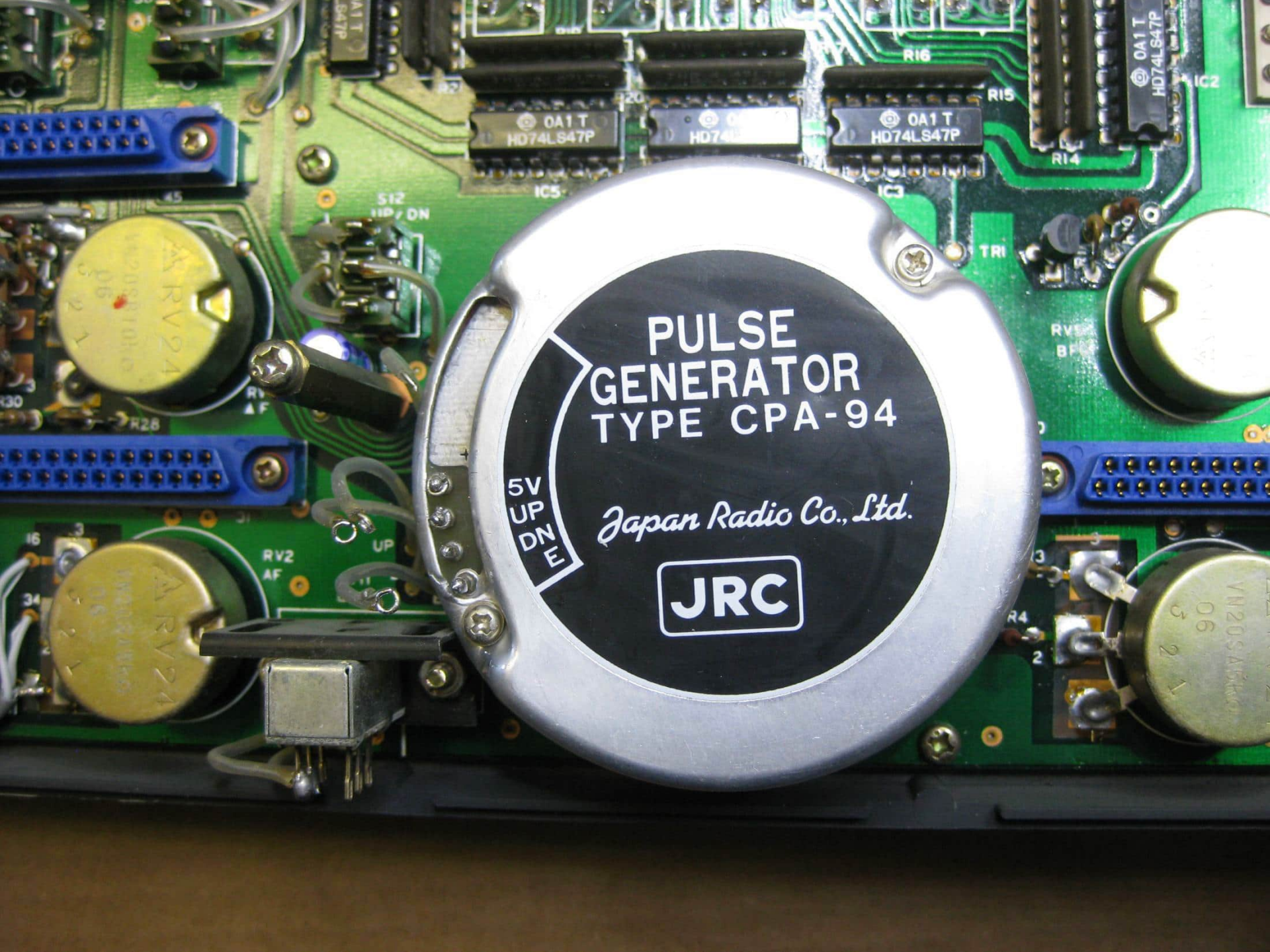


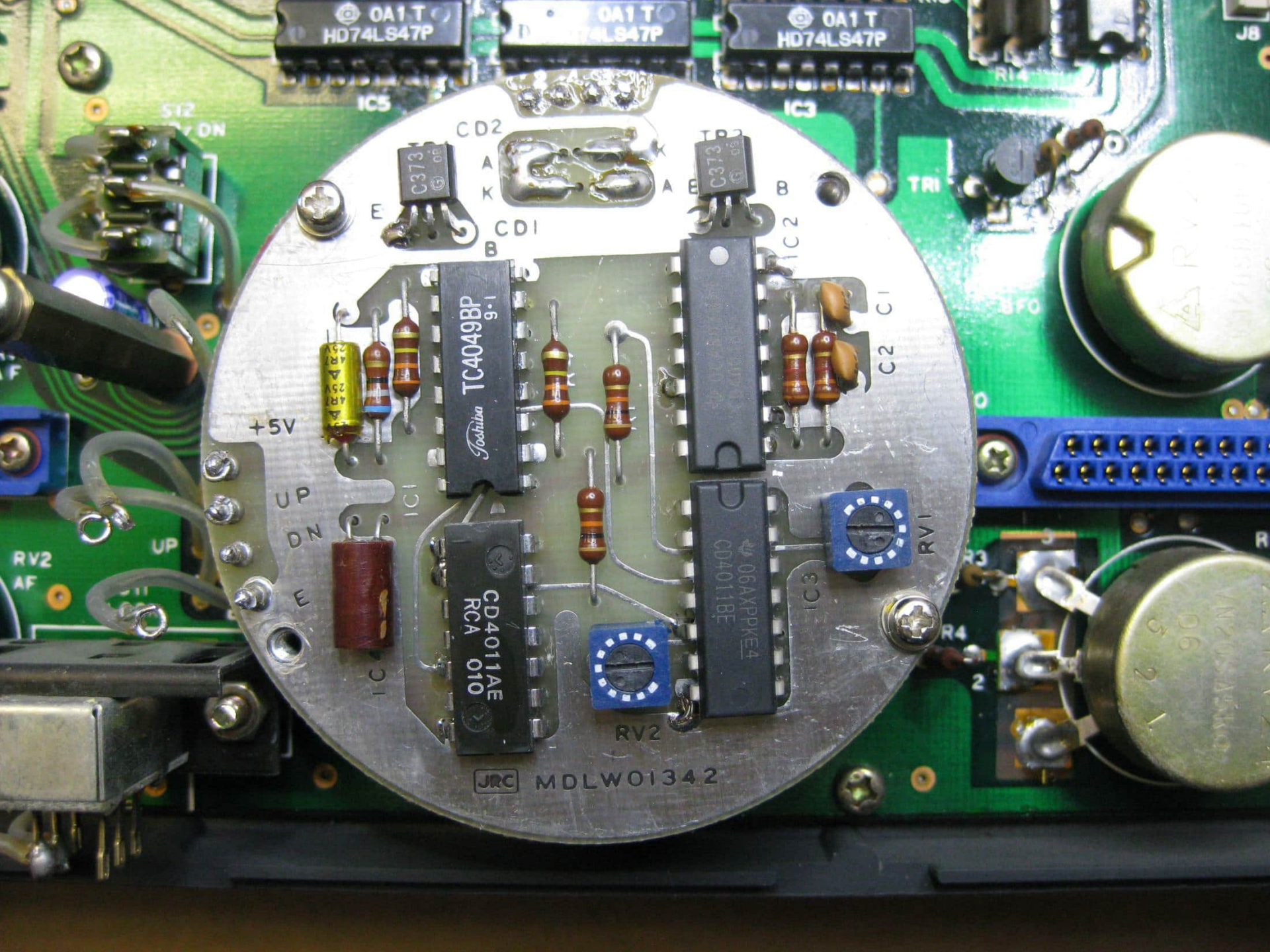
PULSE  
GENERATOR  
TYPE CPA-94

*Japan Radio Co., Ltd.*

JRC

5V  
UP  
DN  
E





JRC MDLW01342

CD4011AE  
RCA 010

06AXPPKE4  
CD4011BE

TC4049BP  
9-1  
Toshiba

C373  
C 09

C373  
C 09

+5V

UP  
DN

E

IC1

IC3

IC2

C1  
C2  
C3

RV1

RV2

CD2

CD1

IC5

IC3

TRI

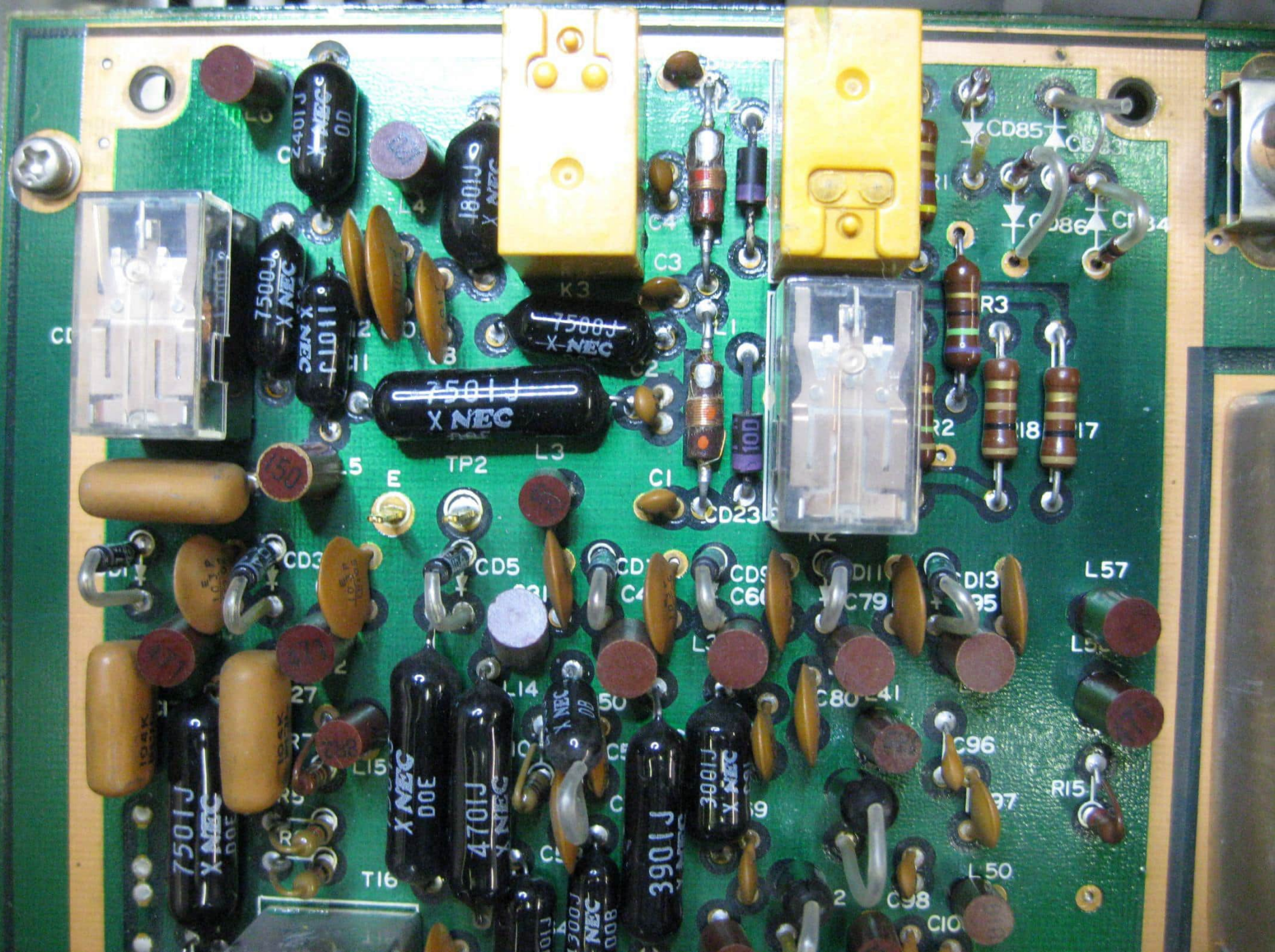
BFO

ST2  
DN

RV2  
AF

UP

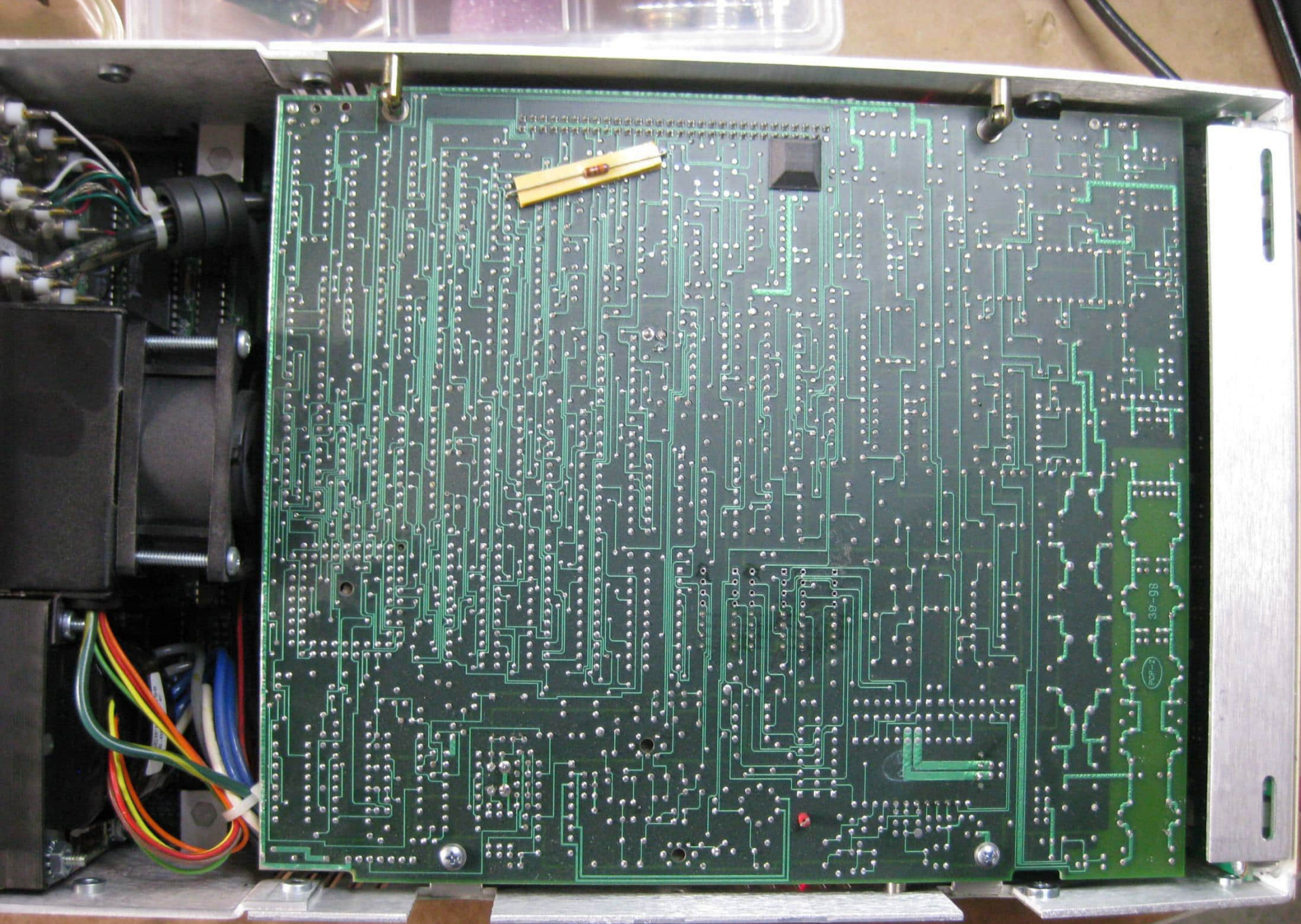
J8

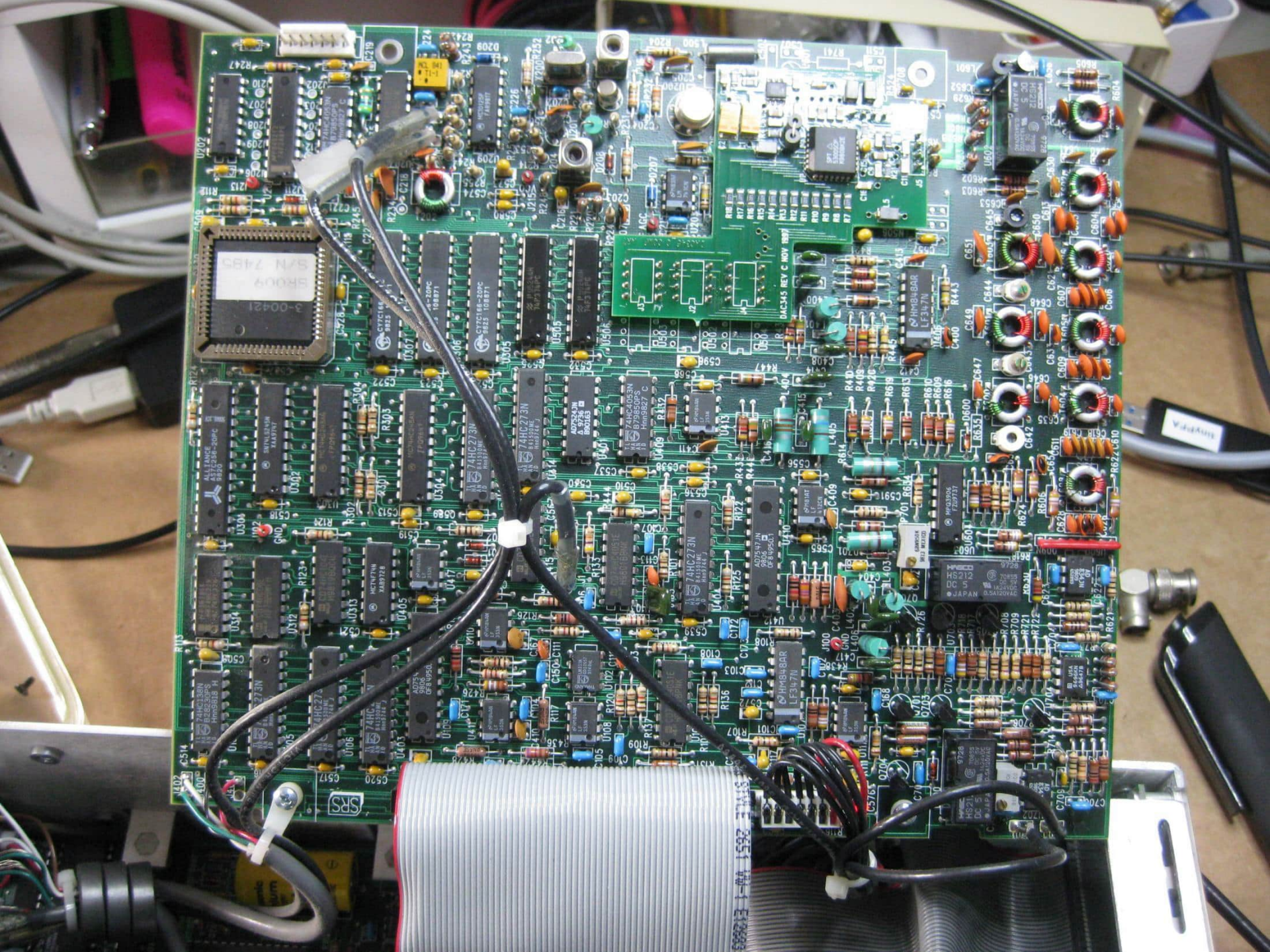


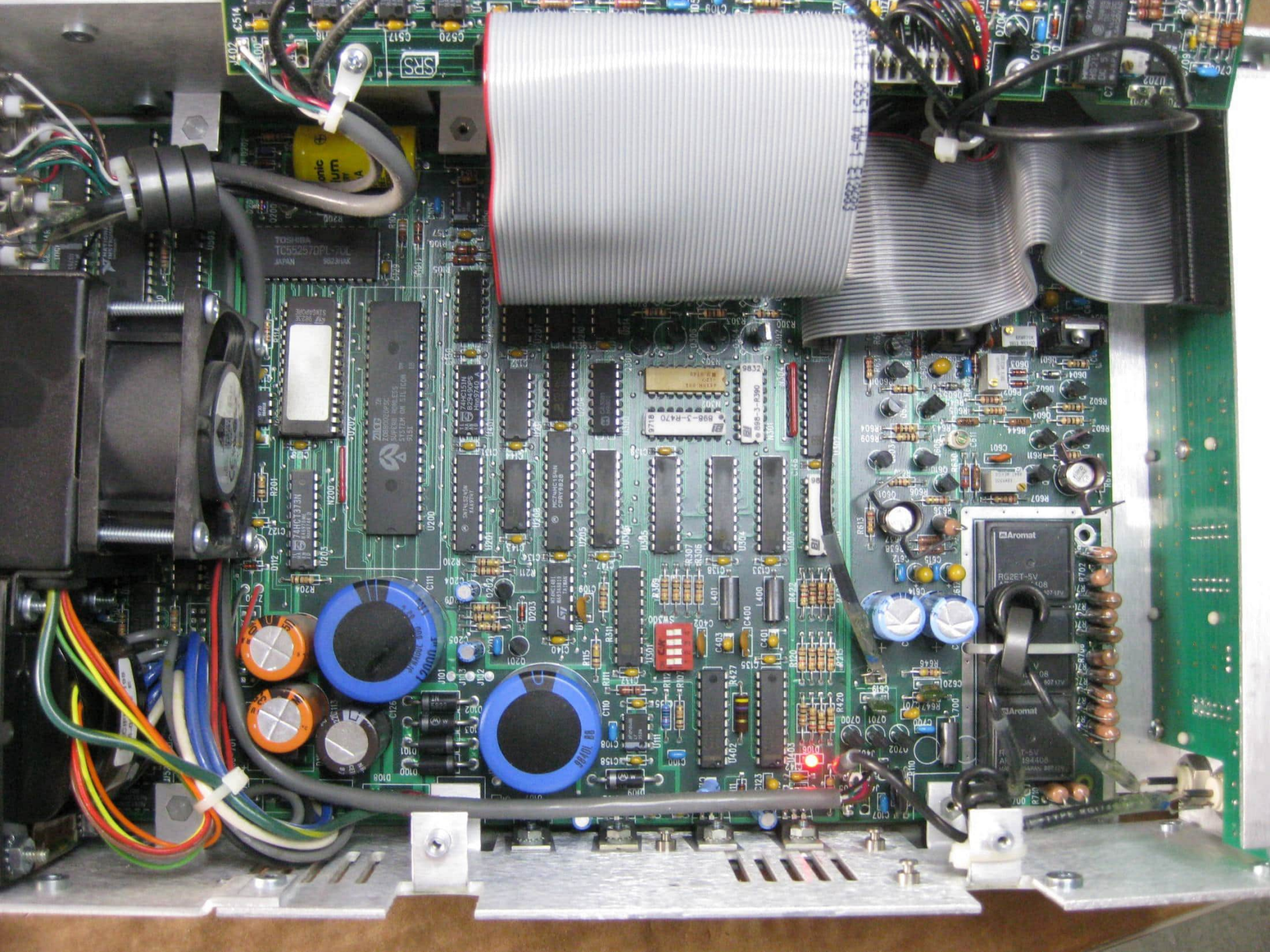


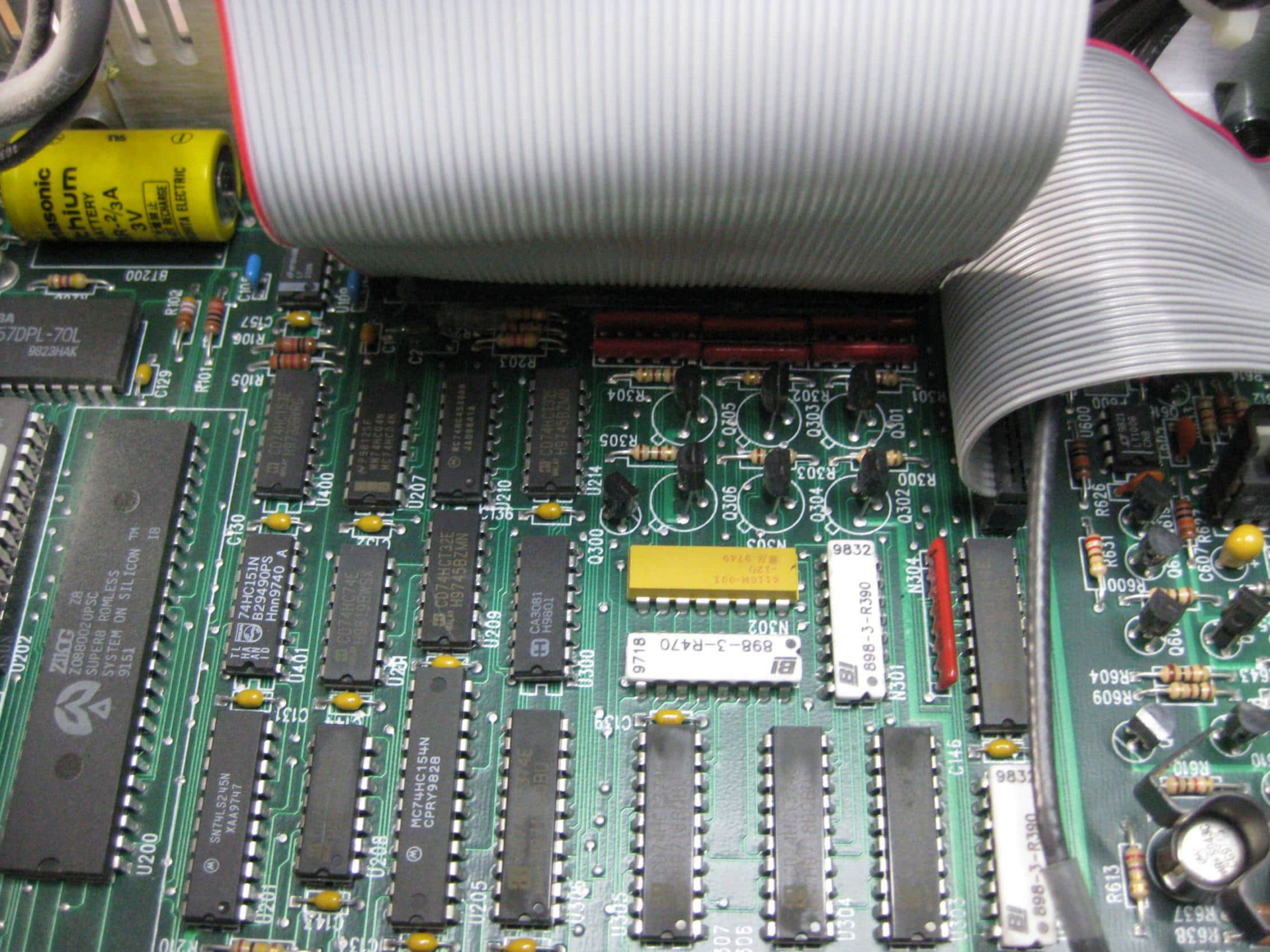
# DS345

- Functie generator tot 32 MHz
- Stanford Research Systems
- 1 Display geen aanwijzing
- Alle documentatie beschikbaar
- Display gelukkig ook leverbaar (Sinuss/Assen)









Panasonic  
NiMH  
BATTERY  
2/3A  
3V  
RECHARGEABLE  
NITA ELECTRIC

57DPL-70L  
9823HAK

Z8000020PSC  
SUPER8 ROMLESS  
SYSTEM ON SILICON™  
9151  
U200

74HC15N  
B29490PS  
Hnn9740 A  
U201

74HC15N  
B29490PS  
Hnn9740 A  
U208

74HC15N  
B29490PS  
Hnn9740 A  
U209

74HC15N  
B29490PS  
Hnn9740 A  
U205

74HC15N  
B29490PS  
Hnn9740 A  
U206

74HC15N  
B29490PS  
Hnn9740 A  
U207

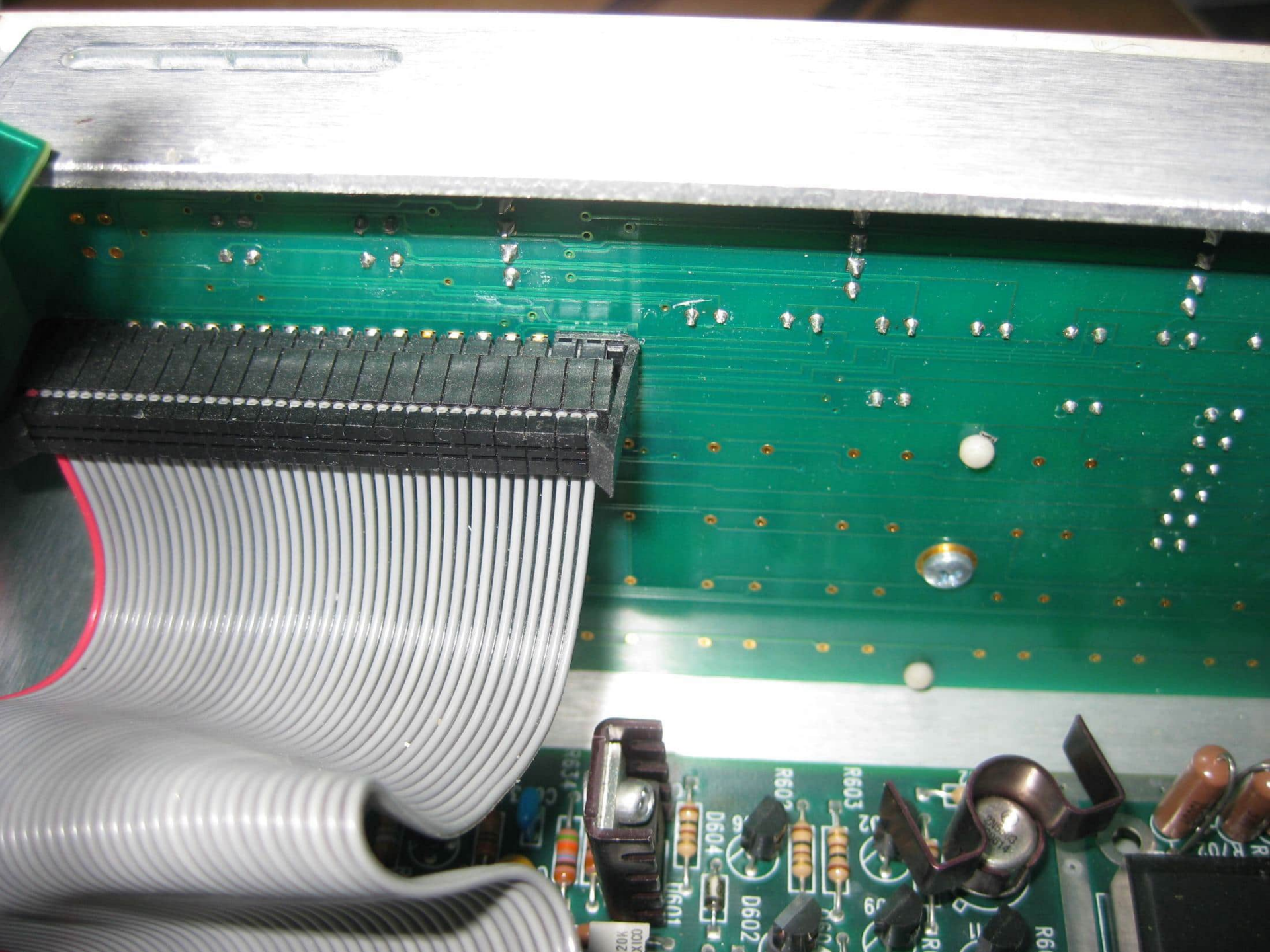
74HC15N  
B29490PS  
Hnn9740 A  
U208

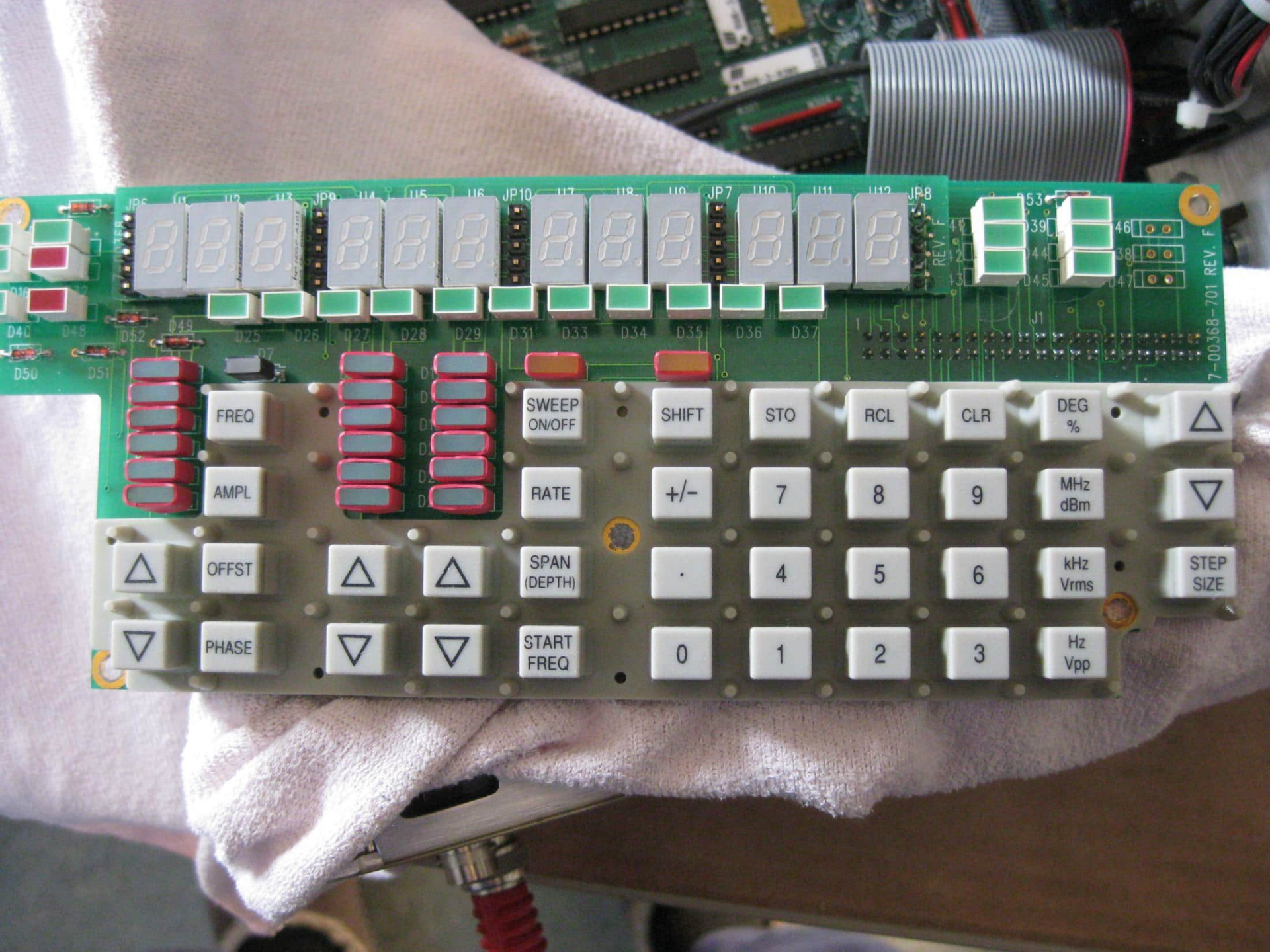
74HC15N  
B29490PS  
Hnn9740 A  
U209

74HC15N  
B29490PS  
Hnn9740 A  
U205

74HC15N  
B29490PS  
Hnn9740 A  
U206

74HC15N  
B29490PS  
Hnn9740 A  
U207





7-00368-701 REV. F

JP6 U1 U2 U3 JP9 U4 U5 U6 JP10 U7 U8 U9 JP7 U10 U11 U12 JP8

REV. F

D40 D48 D50 D51 D52 D49

FREQ

AMPL

SWEEP  
ON/OFF

RATE

SHIFT

+/-

STO

7

RCL

8

CLR

9

DEG  
%

MHz  
dBm

kHz  
Vrms

Hz  
Vpp

△

▽

STEP  
SIZE

△

OFFST

△

△

SPAN  
(DEPTH)

.

4

5

6

▽

PHASE

▽

▽

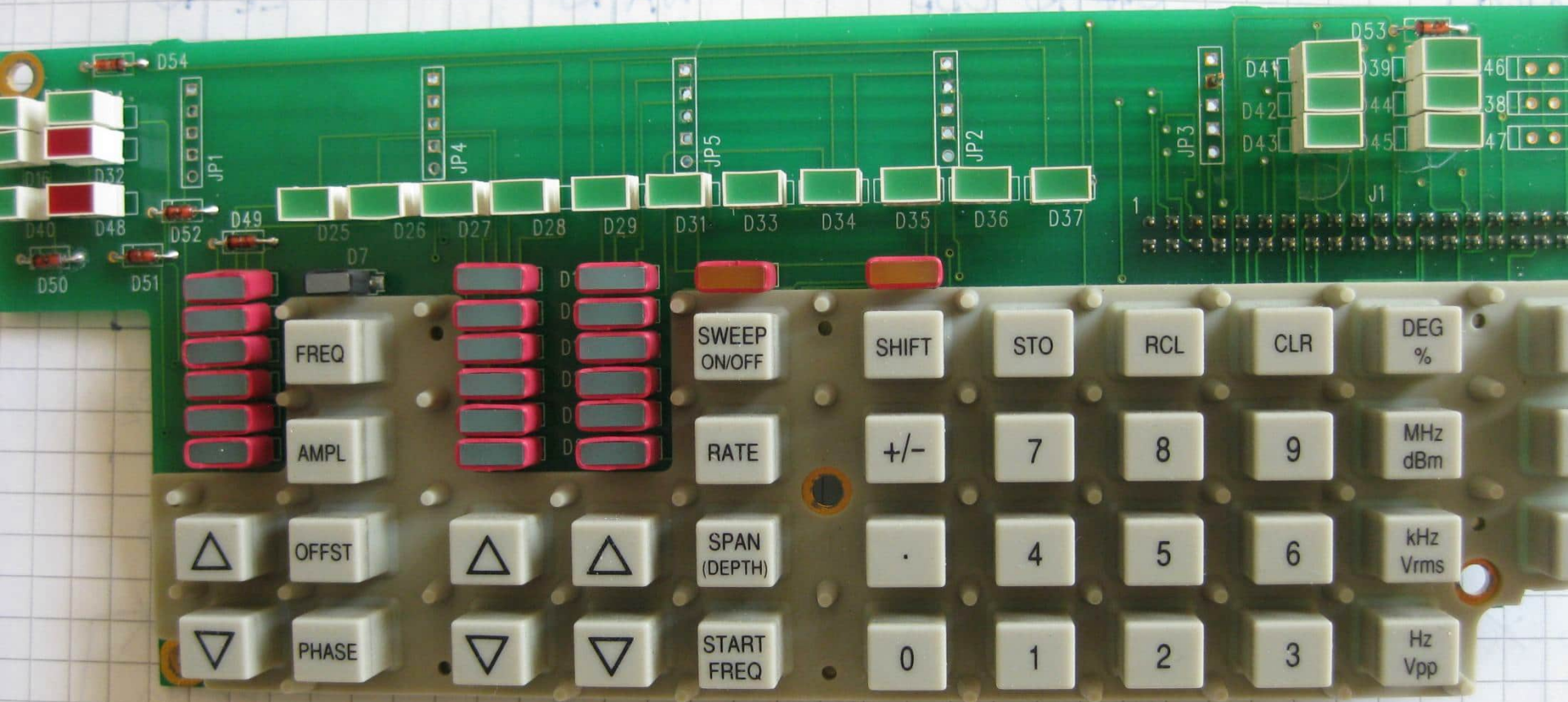
START  
FREQ

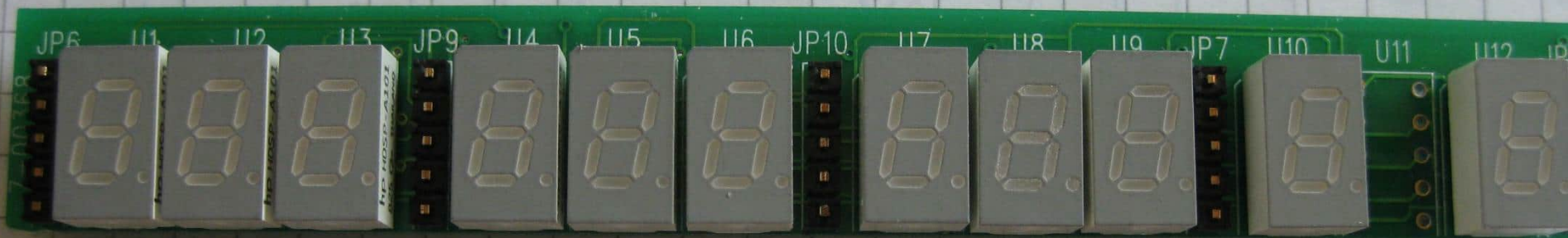
0

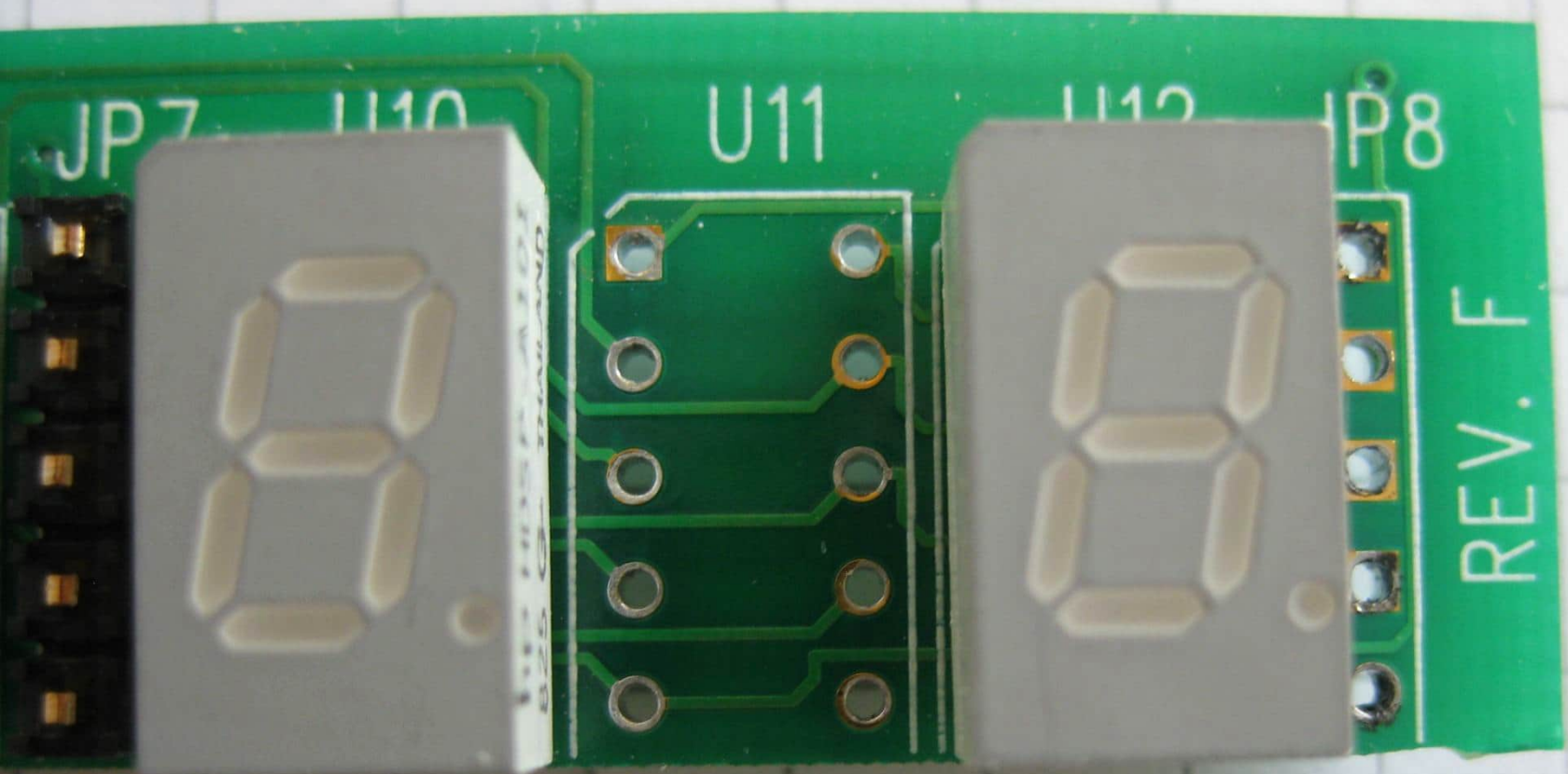
1

2

3







JP7

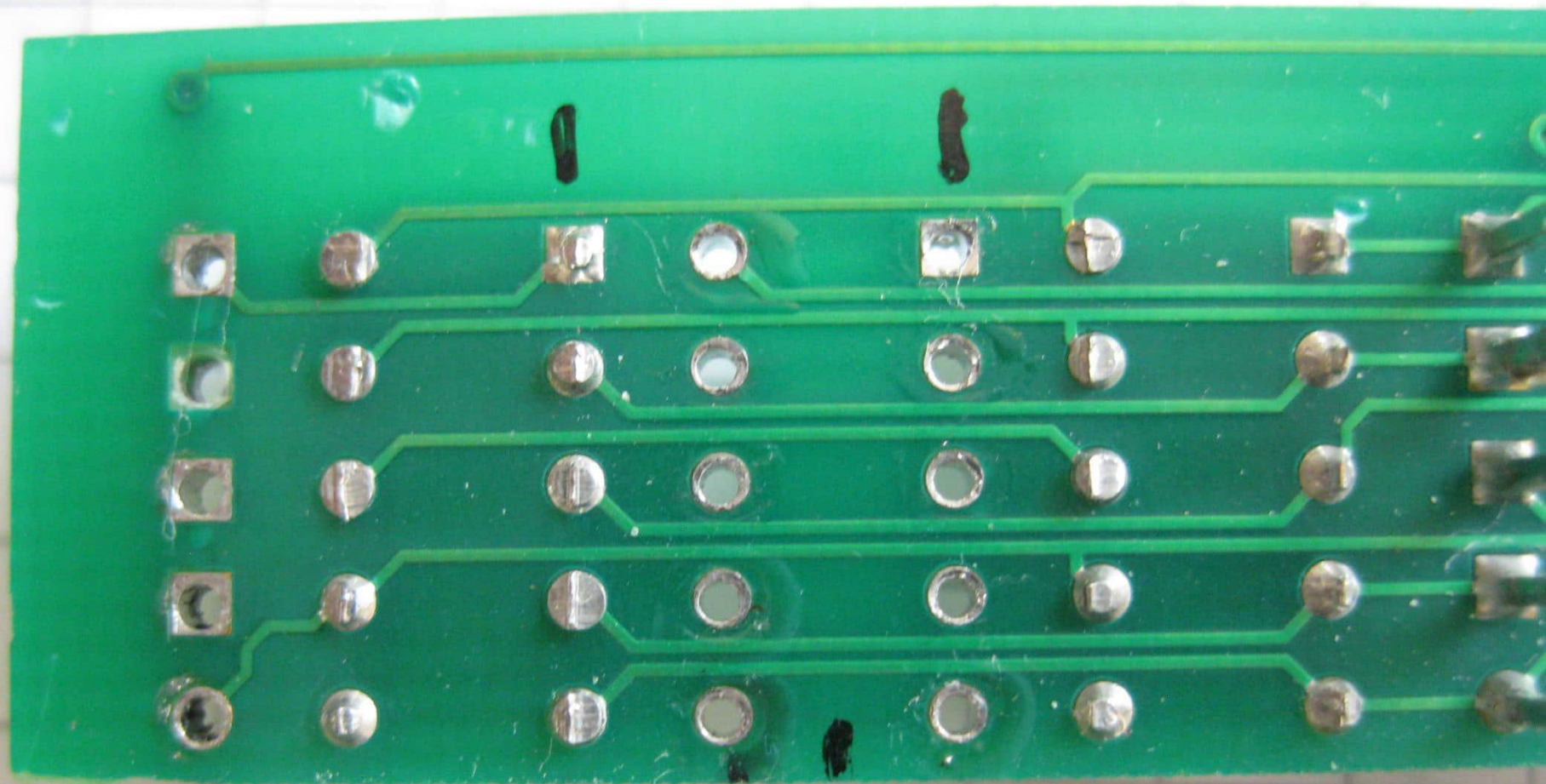
U10

U11

U12

JP8

REV. F



D54

JP1

JP4

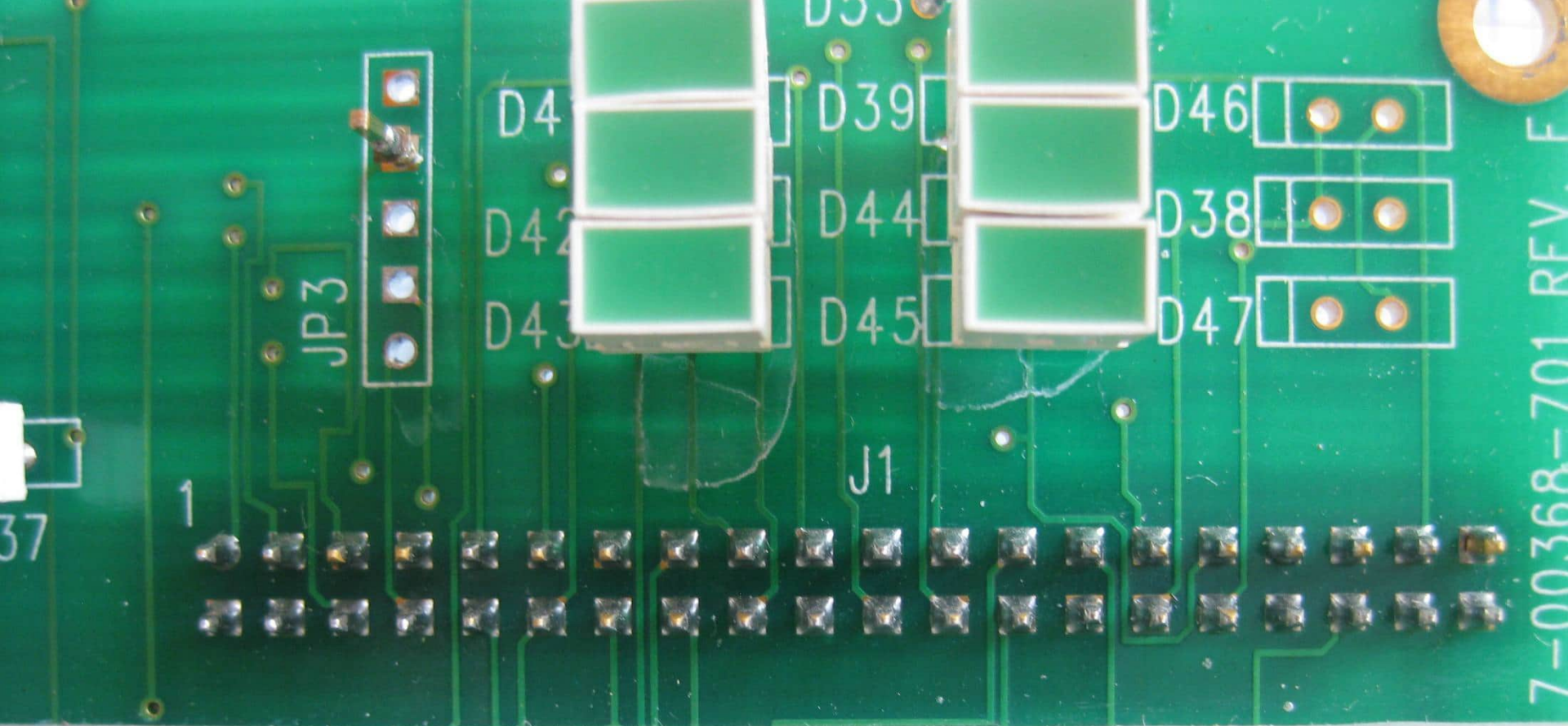
D49

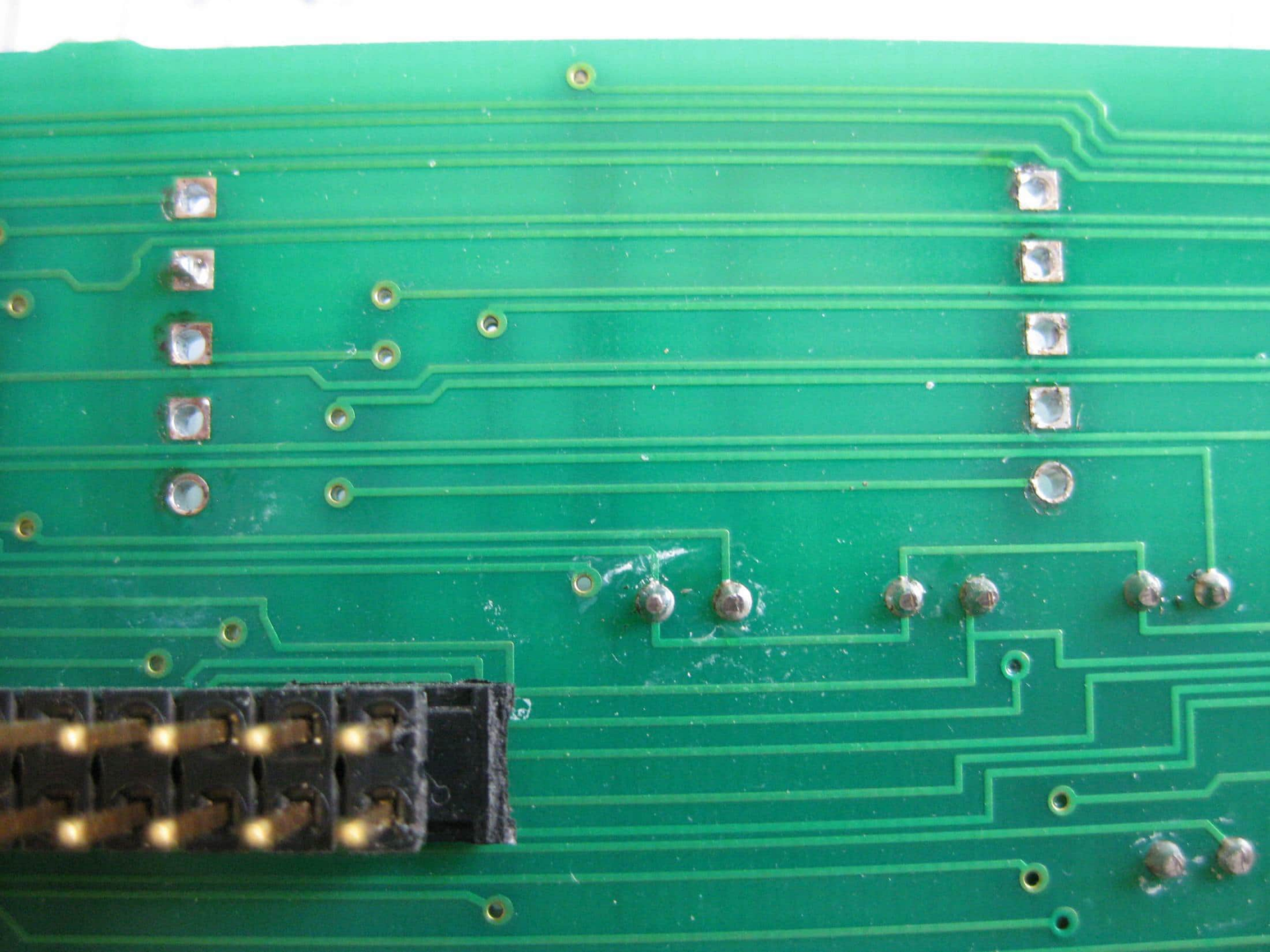
D52

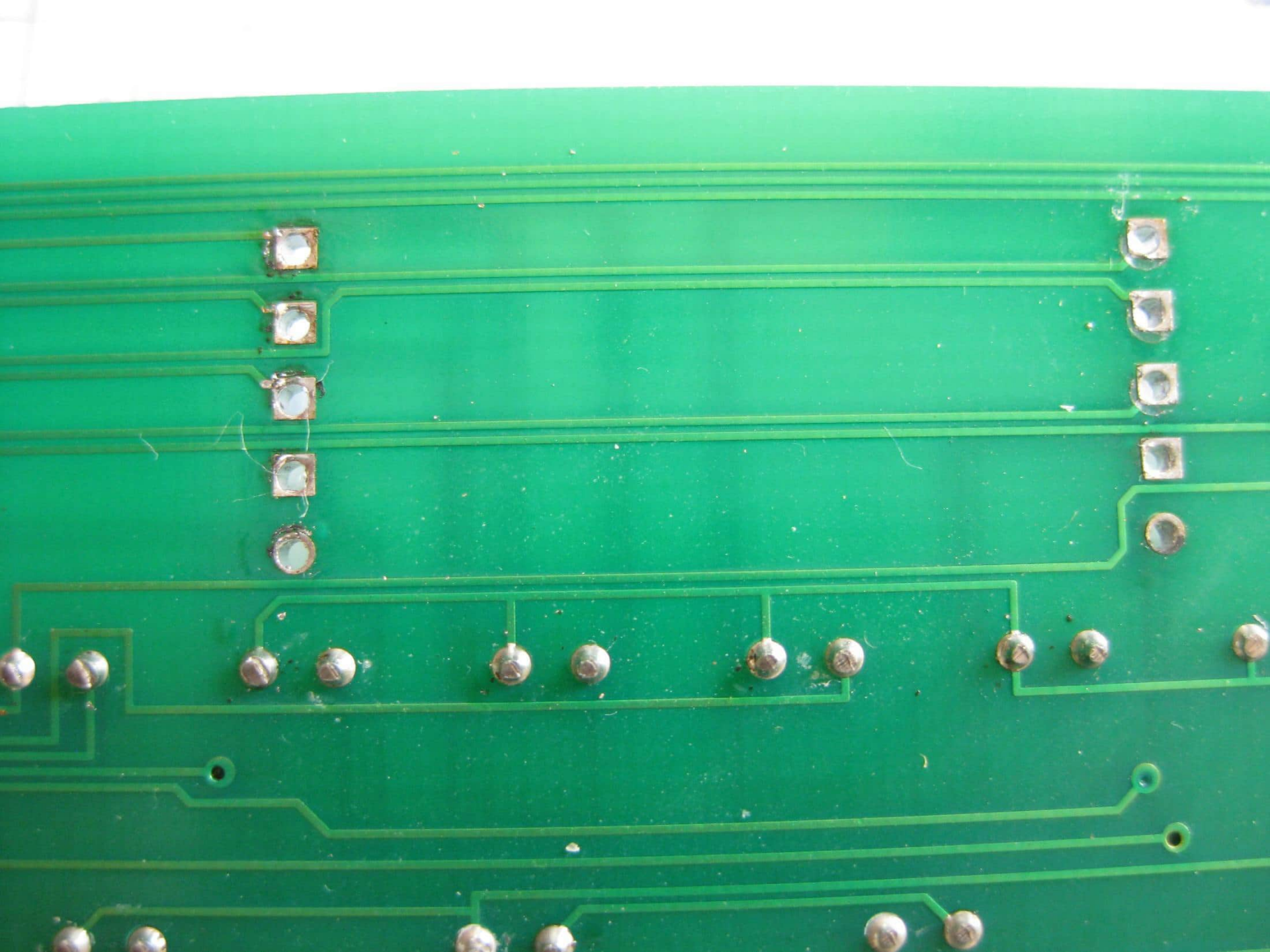
D51

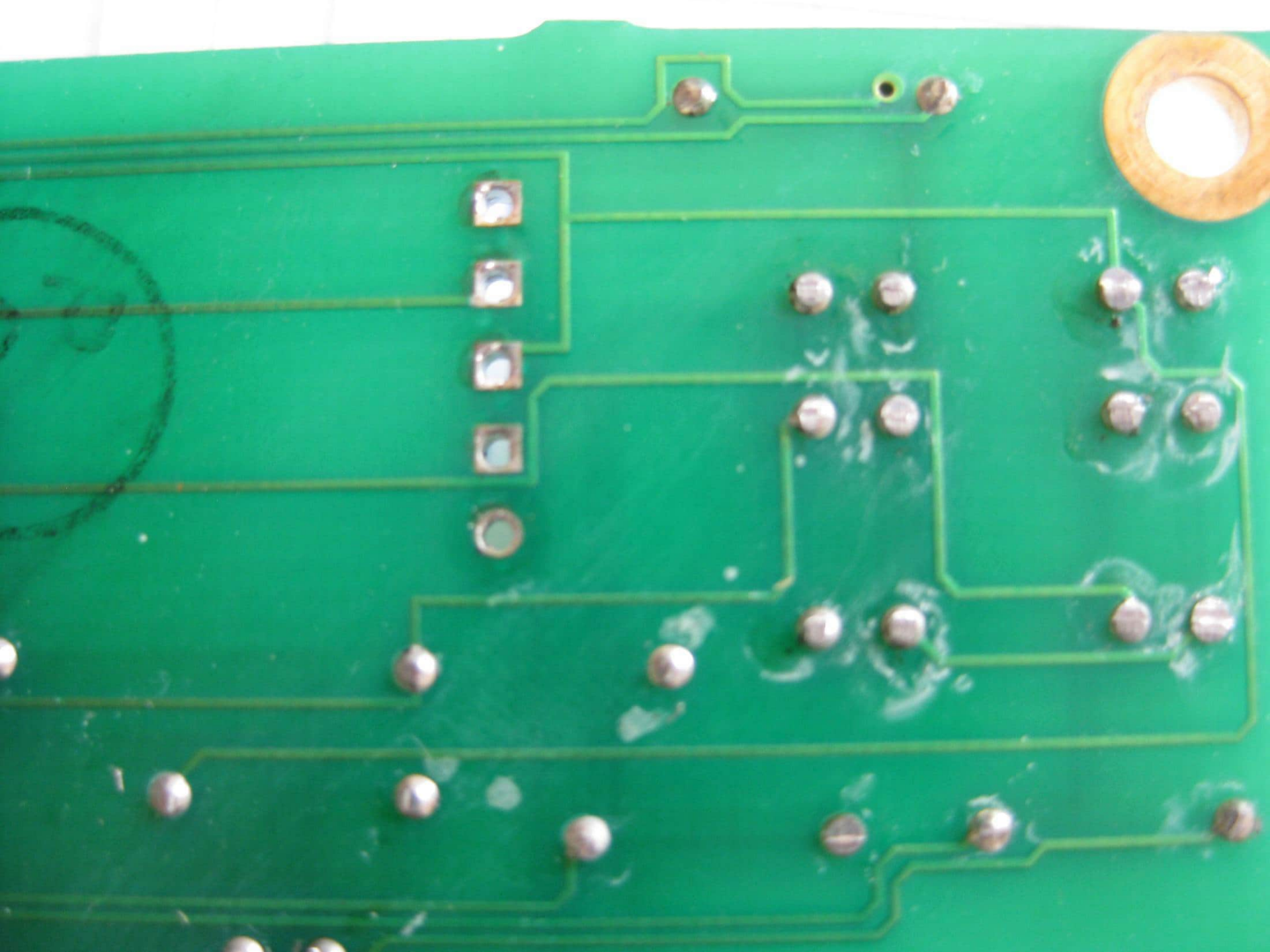
D7

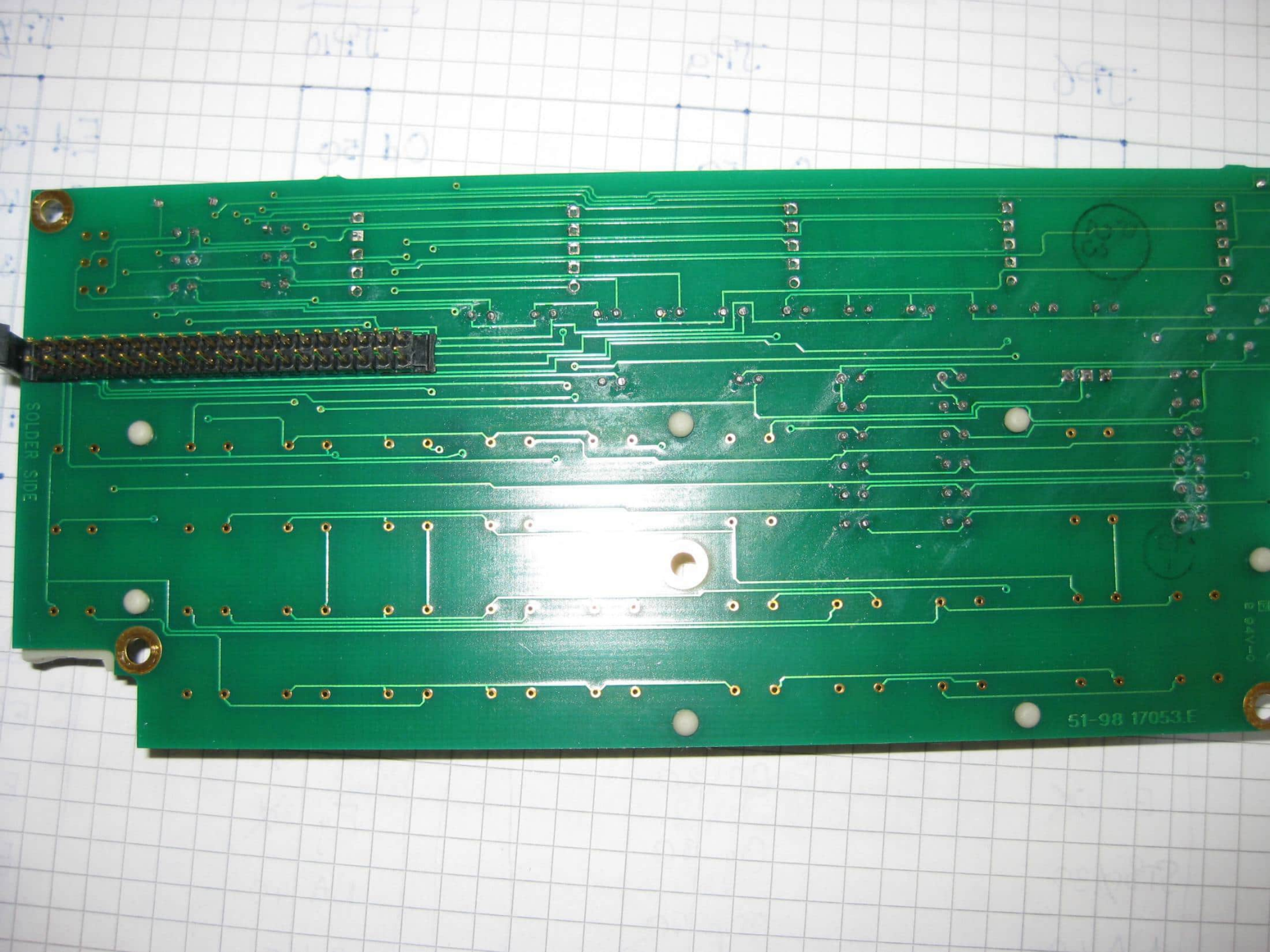
D9

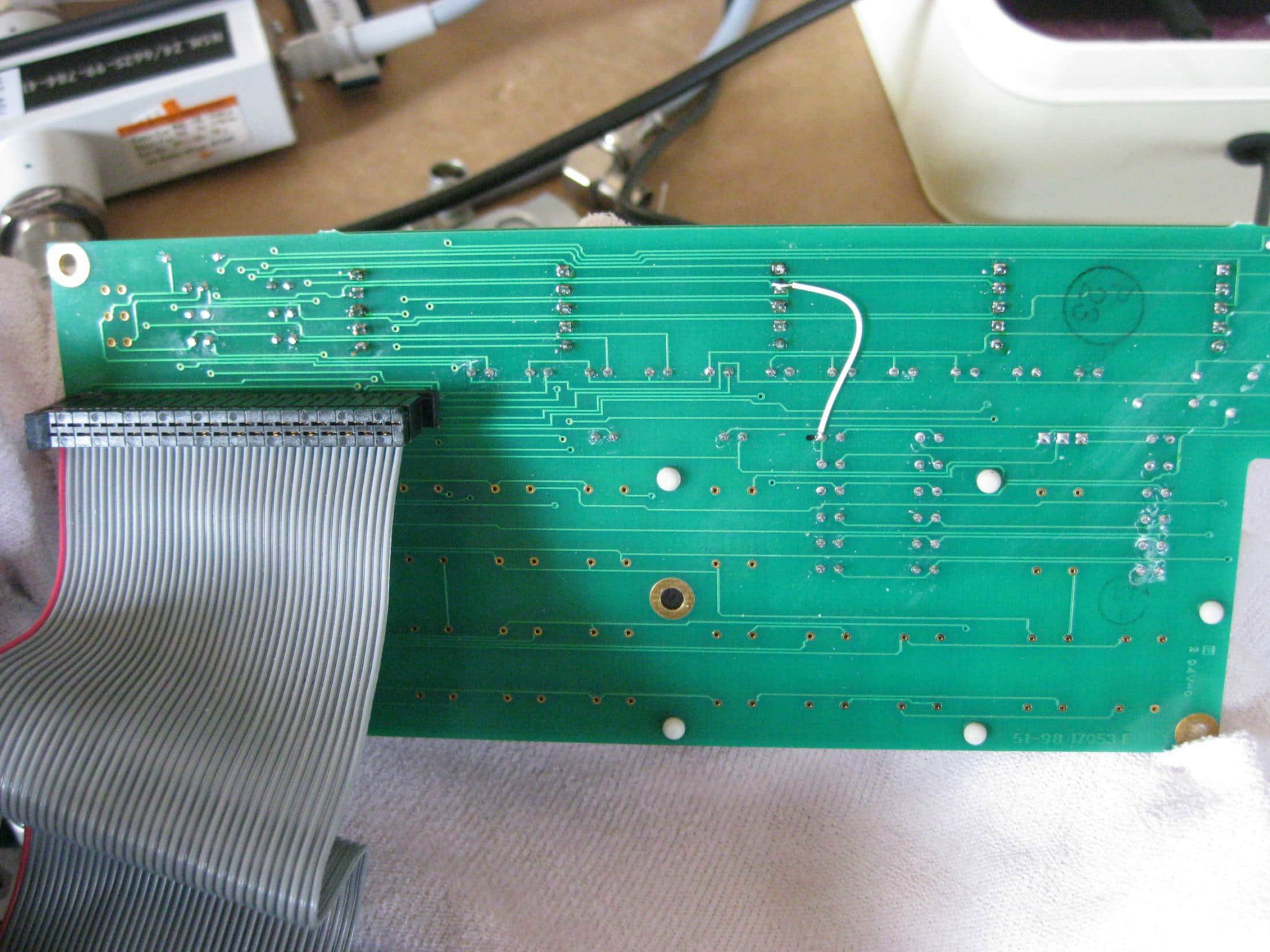












SRS STANFORD RESEARCH SYSTEMS ■ MODEL DS345 ■ 30MHz SYNTHESIZED FUNCTION GENERATOR

STATUS  
REM SRQ  
ACT ERR  
TIMEBASE  
EXT FPR

10 000 000.000

Hz  
DEG  
dBm  
Vrms  
Vpp

FUNCTION FREQ AMPL OFFS PHASE TRIG STEP SPAN RATE MRK STRT I STOP I MODULATION

OUTPUTS

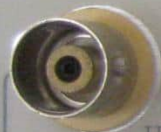
FUNCTION

SWEEP/MODULATE

ENTRY

MODIFY

SYNC



TTL

FUNCTION



40V max

50 Ω

~  
~  
~  
NOISE  
ARB

TRIG'D

FREQ

TTL

AMPL

ECL

OFFST

REL = 0

PHASE

LIN SWP  
LOG SWP  
AM (INT)  
FM  
BURST

SINGLE  
~  
~  
ARB

MOD/SWP  
SWEEP  
ON/OFF  
BRST CNT  
RATE

SWP CF  
SPAN  
(DEPTH)

STOP I  
START  
FREQ

SHIFT

SHIFT

GPIB

+/-

MRK START

TRIG SOURCE

0

ARB EDIT  
STO

SRQ  
7

MRK STOP

4

1

DEFAULTS  
RCL

RS232  
8

MRK CF

5

MRK = SPAN

2

CALIBRATE  
CLR

DATA  
9

MRK SPAN

6

SPAN = MRK

3

DEG  
%

MHz  
dBm

kHz  
Vrms

Hz  
Vpp



LOCAL

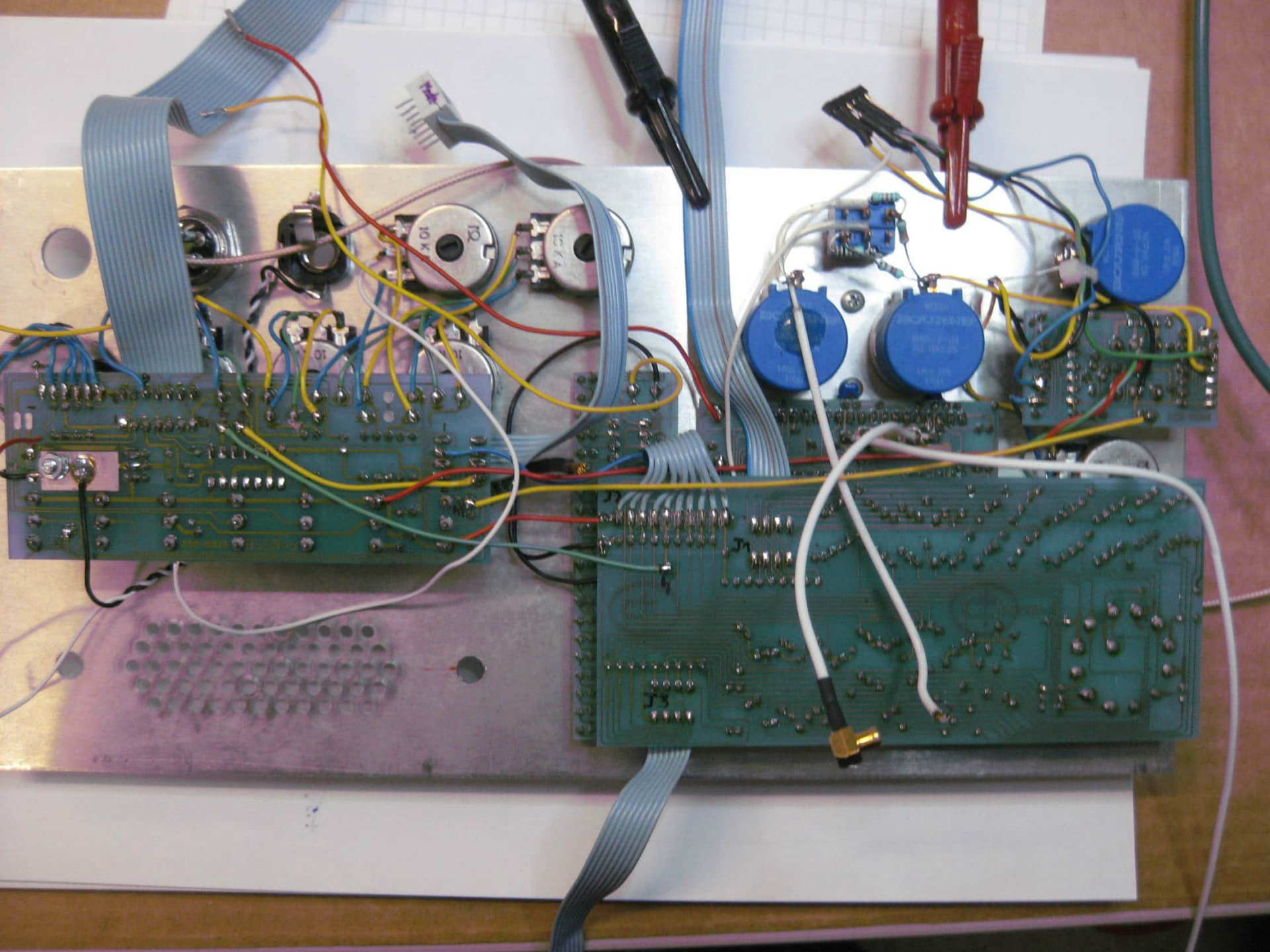
STEP  
SIZE

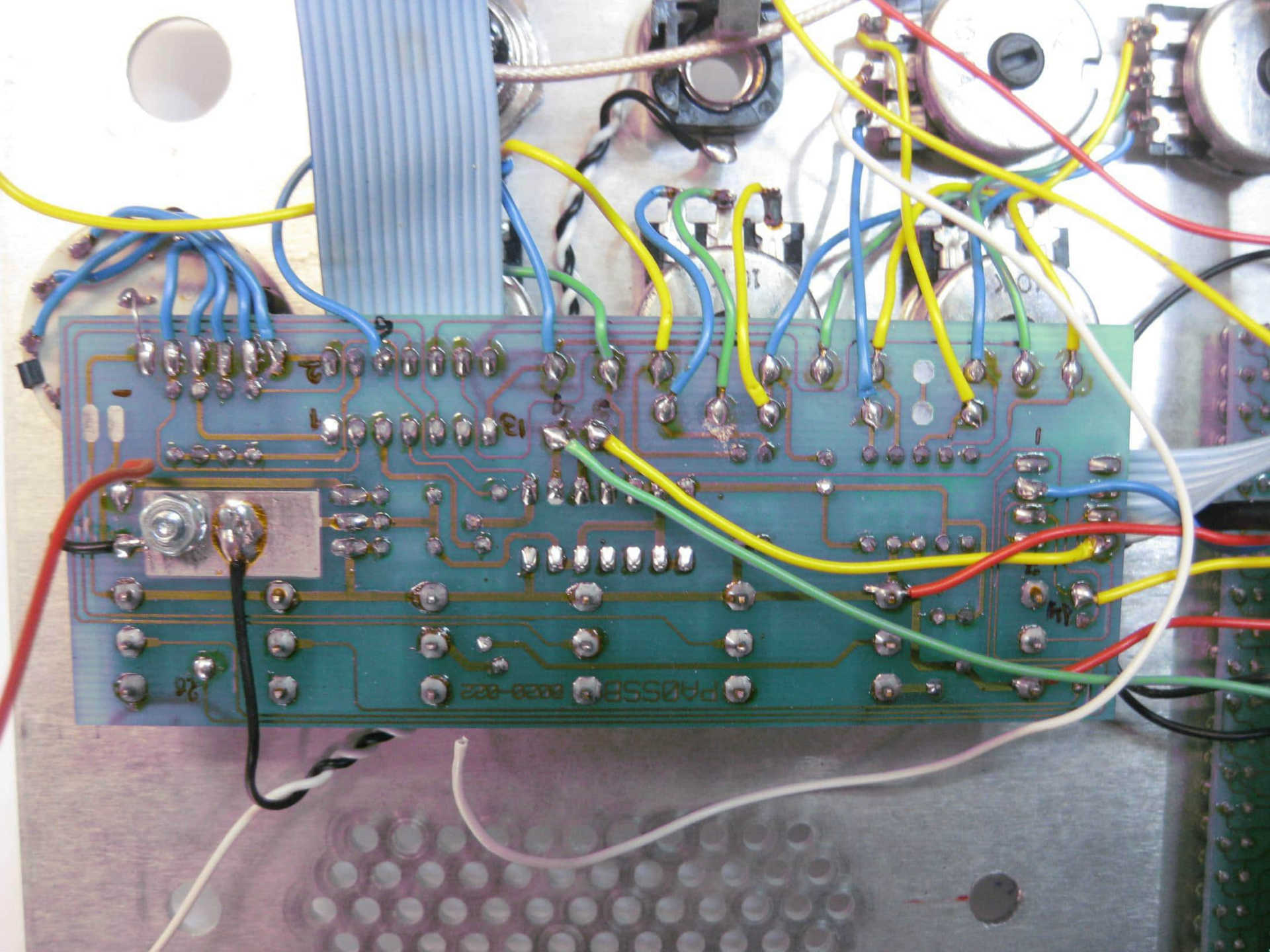
ON/STBY

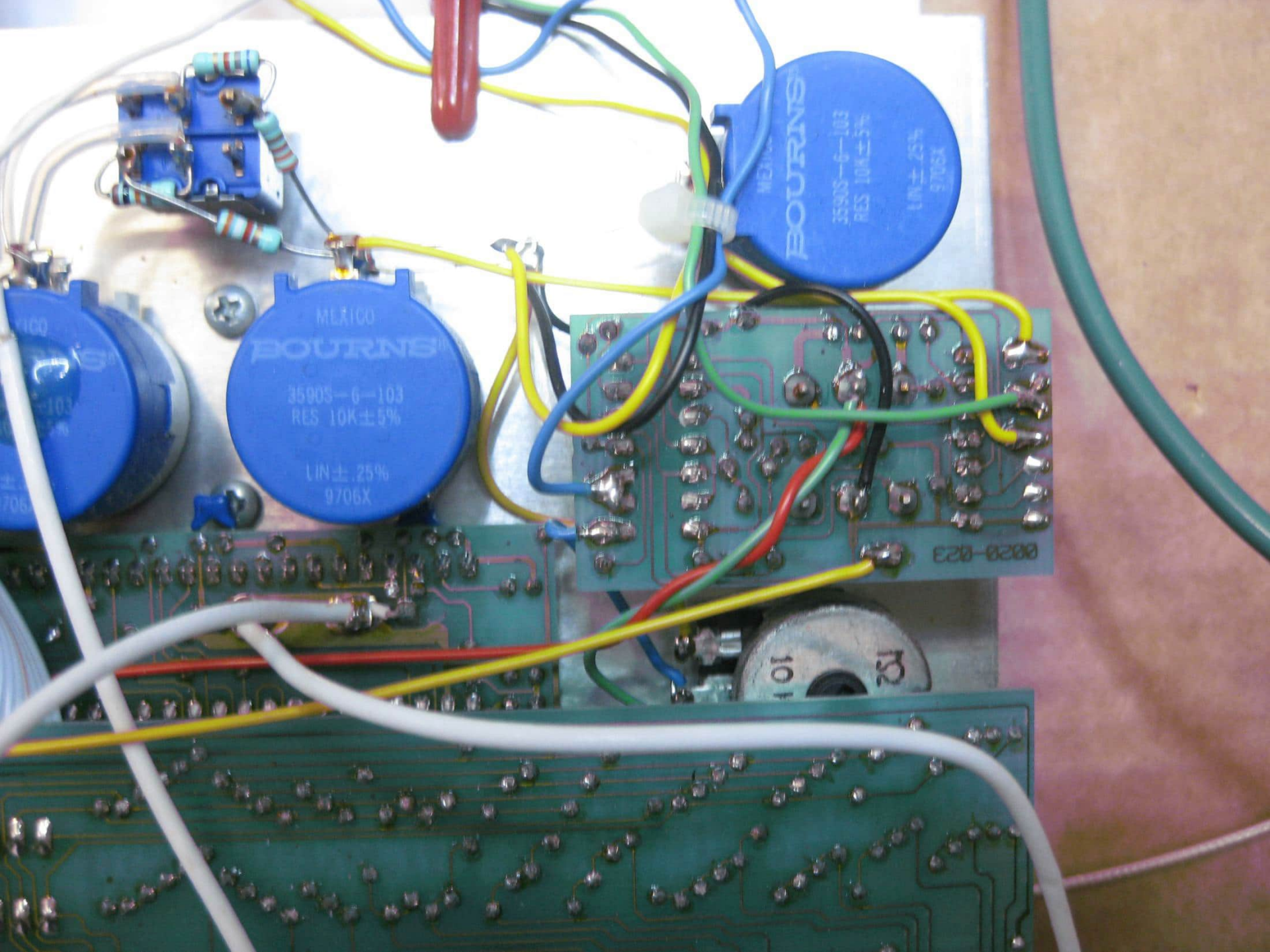


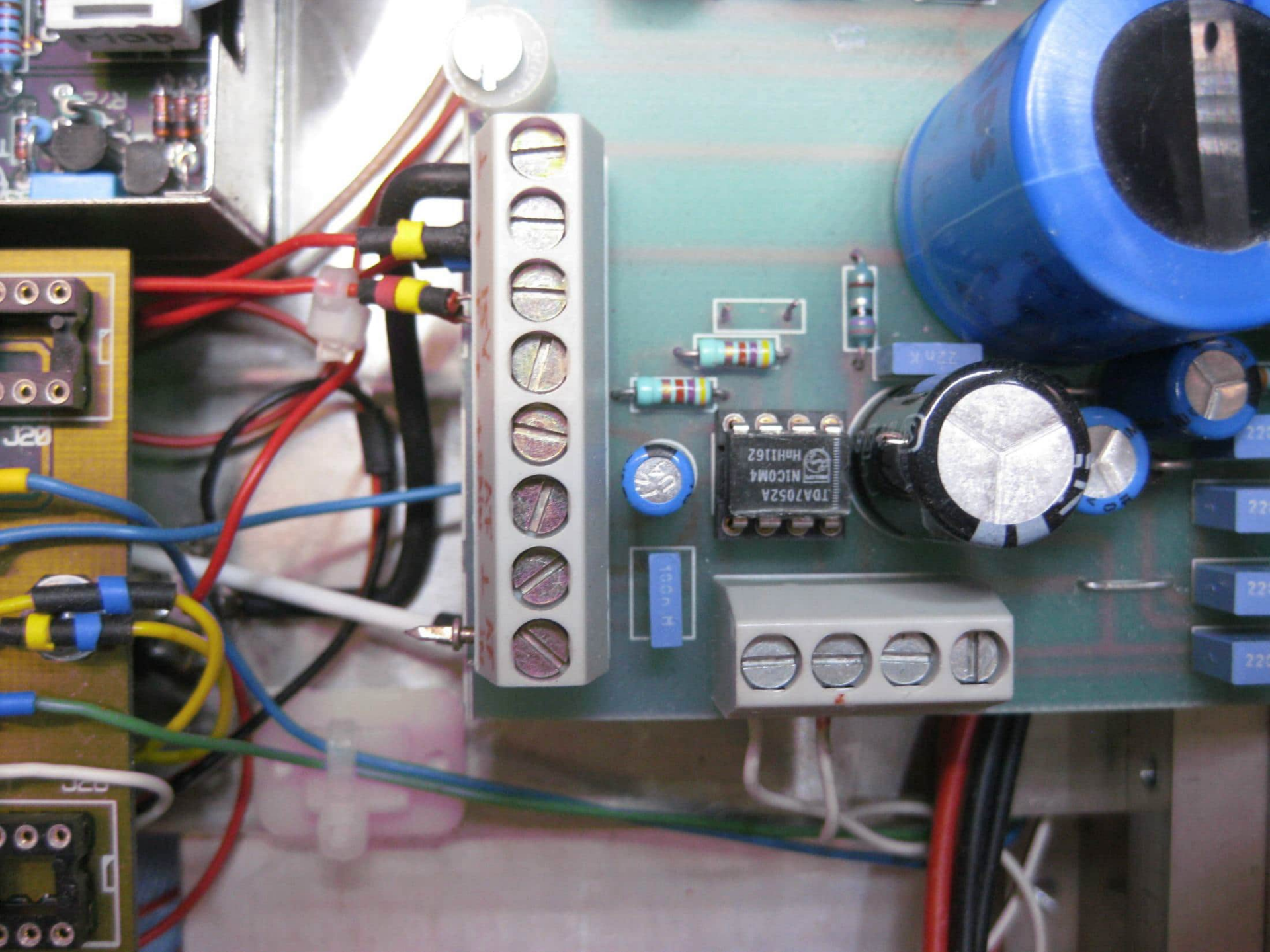
# HF-6 PAØSSB Transceiver

- Zelfbouw project uit jaren 90
- Publicatie in blad A-14
- Display niet OK
- Te weinig LF
- Lag jaren weg te kwijnen in een hoekje van de shack
- Weeskind in de shack

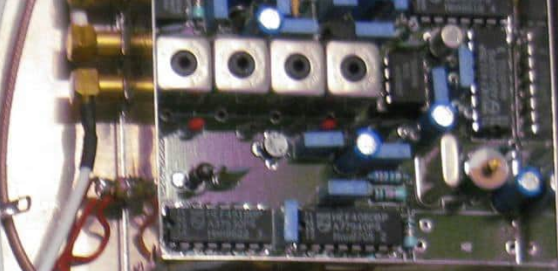
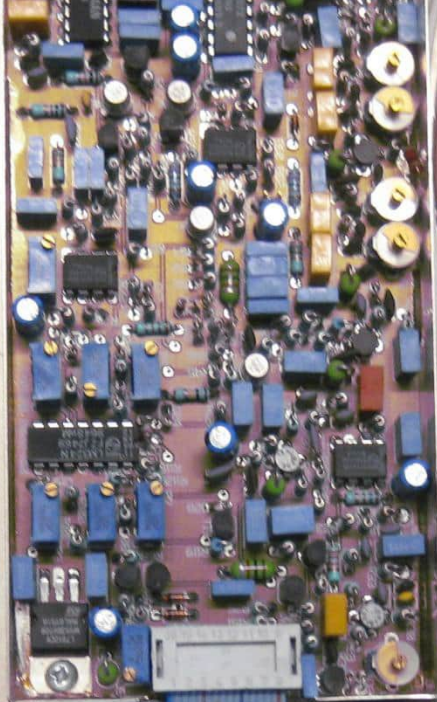








LB



RB



PA# SSB HF-6 DX-TRANSCEIVER

LS

PH



HF-6

GC

+dB

RX

SIGNAL  
S

TX

POWER  
W



BAND

3

MHz

625.0

kHz

TUNING

FAST

SLOW  
VFO 1  
RX

BAND M



RIT



OFF ON  
VFO 1 VFO 2



TUNE

ON

OFF

TX

ON

OFF

AGC

F

OFF

IF

W

N

PREAMP

ON

OFF

NOTCH

ON

OFF

PWR

OFF

AM

CW

SSB

REV

FM

TX POWER

PBT-BFO-SQ

NOTCH

POWER ON

MIKE

PHONE

PB NORM

AF GAIN

RF GAIN

0

1000

500

Hz

OFF

ON

VFO 1

VFO 2

VFO 2 TX

NAME PA3GIL

# Conclusie

- Het loont de moeite
- Geeft veel voldoening
- Kwestie van volhouden
- Maar doe toch liever wat anders.....
- Bijvoorbeeld nieuwe projecten
- DANK VOOR JULLIE AANDACHT !!!