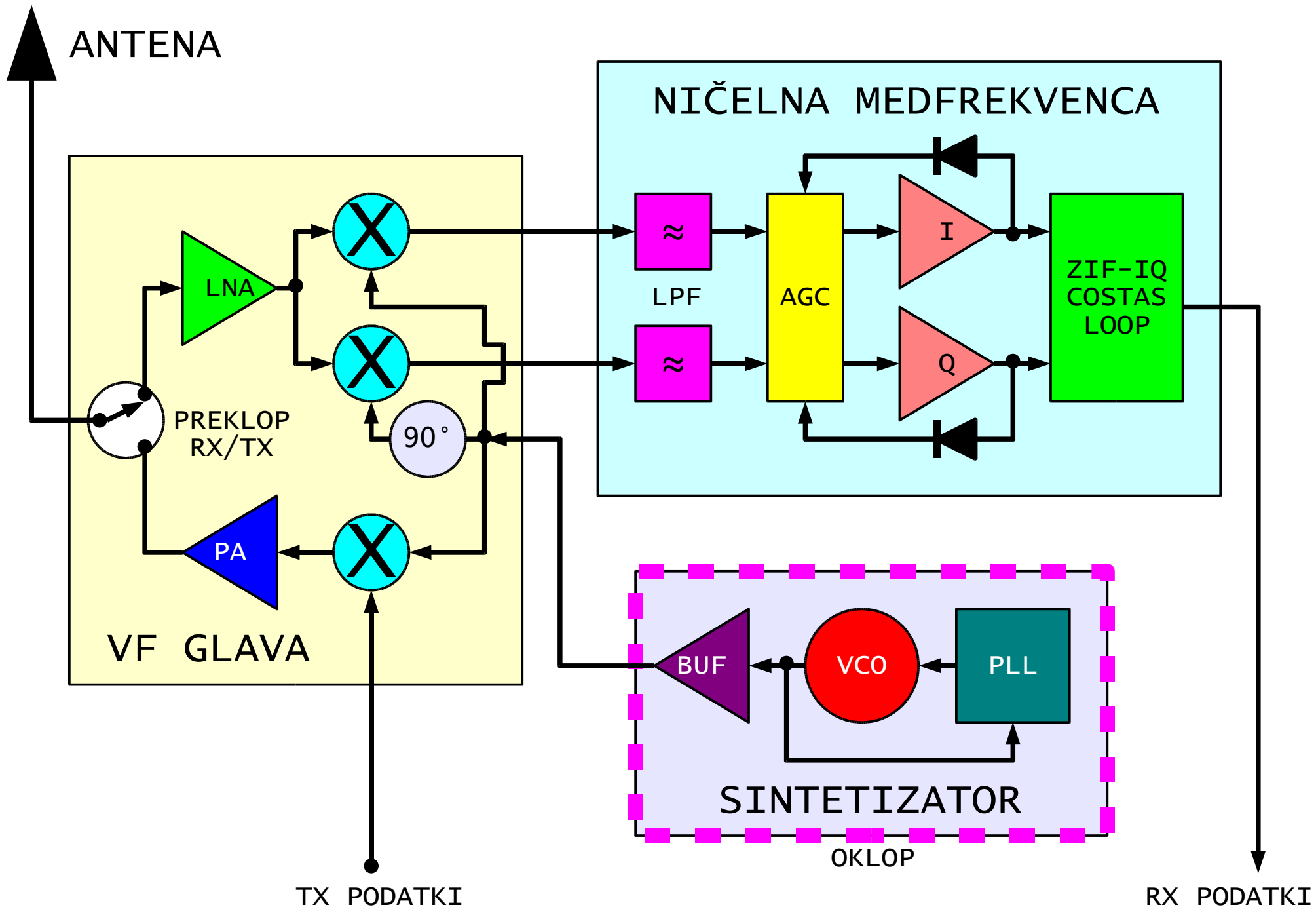


RIS 2011

MEGABITNA BPSK
RADIJSKA POSTAJA
ZA 430-440MHZ

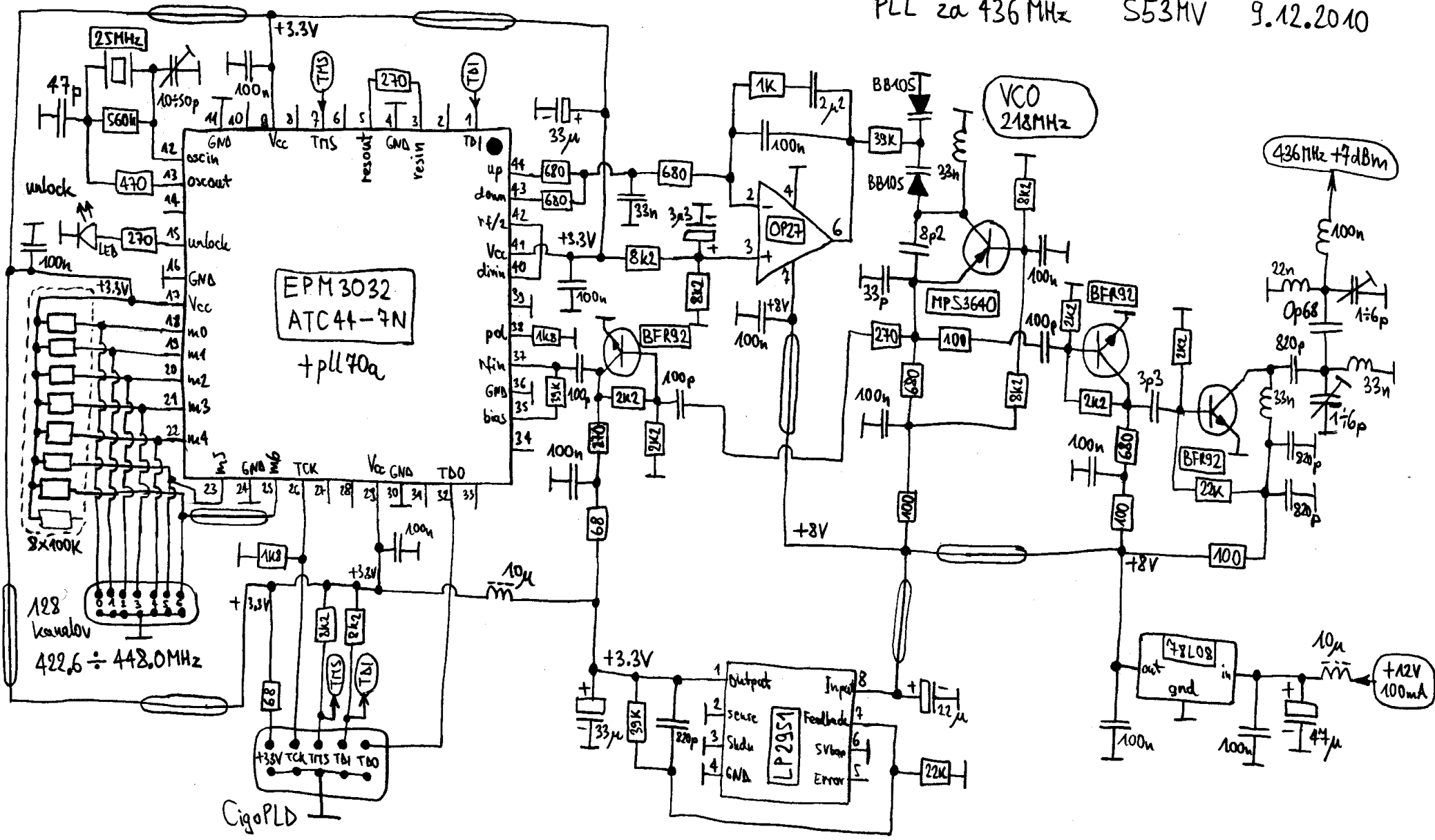
Matjaž Vidmar, S53MV

FE, Ljubljana, 22.01.2011



OSNOVNI NAČRT ZIF-BPSK RADIJSKE POSTAJE

PLL za 436 MHz S53MV 9.12.2010



128 kanalov
422,6 ÷ 448,0 MHz

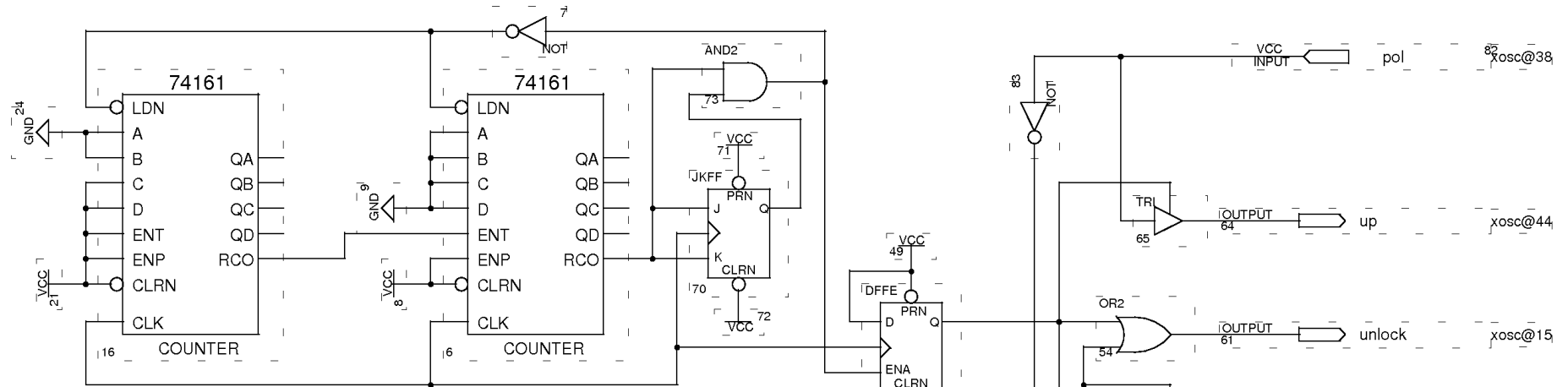
EPM3032
ATC4+-7N
+pll70a

VCO
218MHz

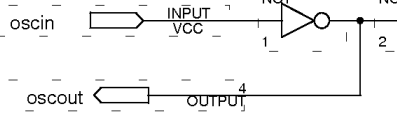
436MHz +7dBm

+12V
100mA

CigoplD

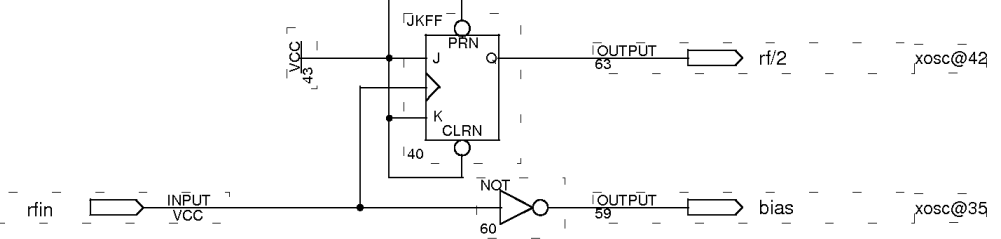


xosc@12,3



xosc@13

xosc@37,41



xosc@42

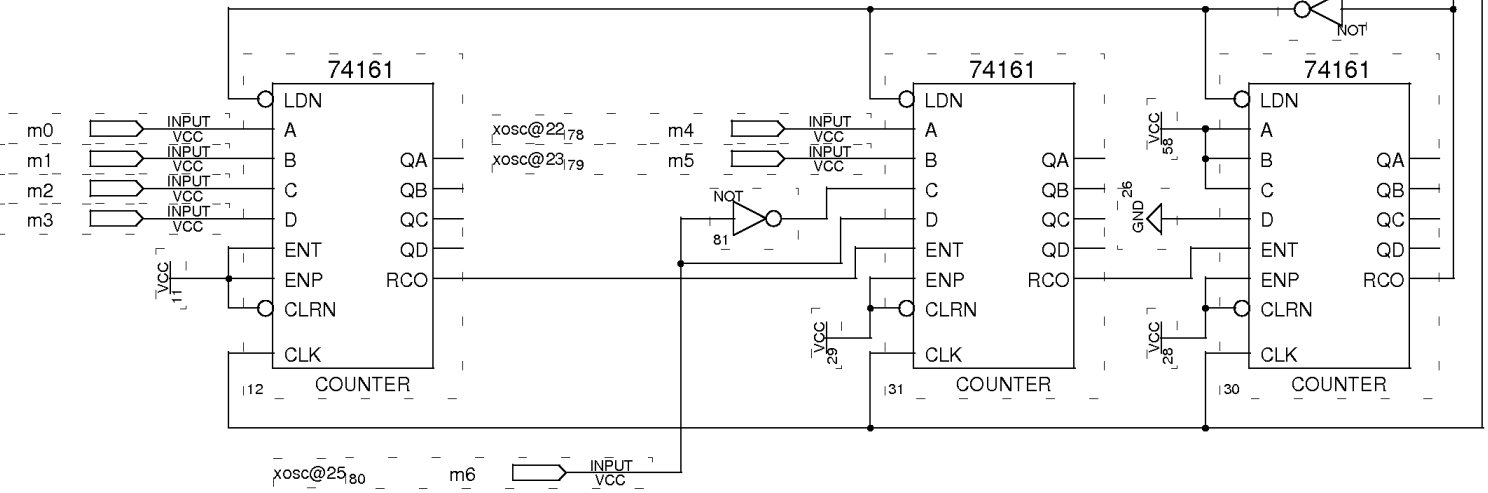
xosc@35

xosc@18,75

xosc@19,76

xosc@20,69

xosc@21,77



xosc@25,80

xosc@22,78

xosc@23,79

xosc@25,80

xosc@38

xosc@44

xosc@15

xosc@43

xosc@5

xosc@3

xosc@40

pol

up

unlock

down

resout

resin

divin



(Last Compilation [Successful]) - Floorplan Editor

Chip Name: xosc (EPM3032ATC44-4)

Color Legend

- Unassigned
- Device-Wide Fan-Out
- Unrouted
- Parallel Expanders
- Local LAB Fan-Out Only

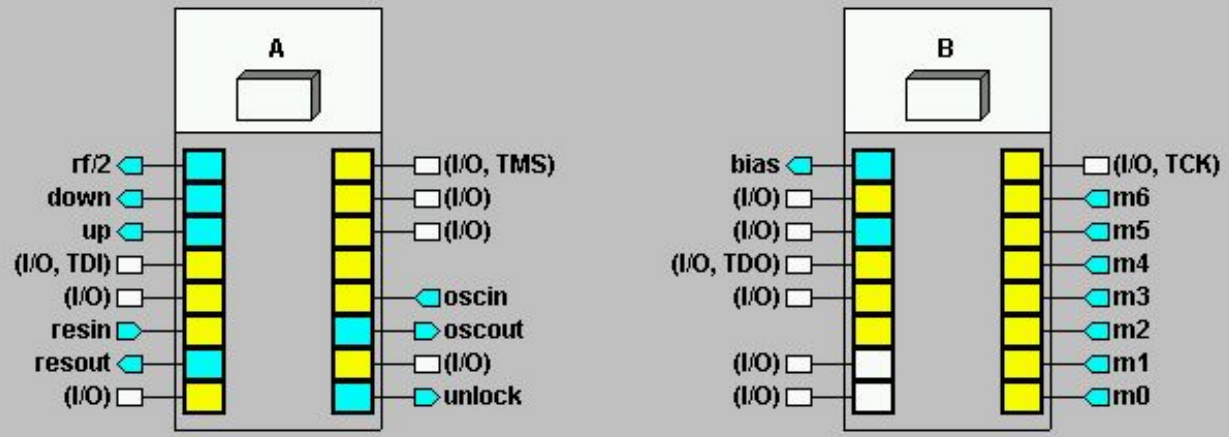
Unassigned Nodes & Pins:

[Empty list box for unassigned nodes and pins]

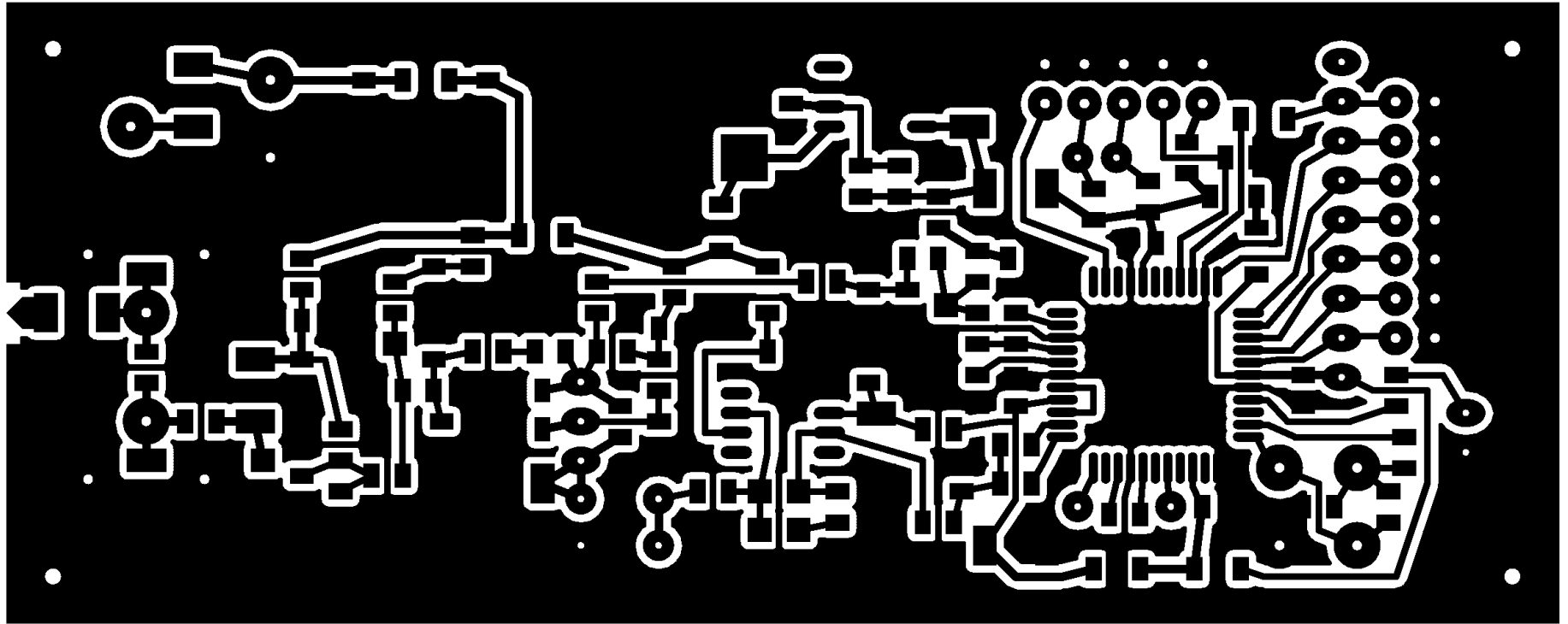
Selected Node(s) & Pin(s):

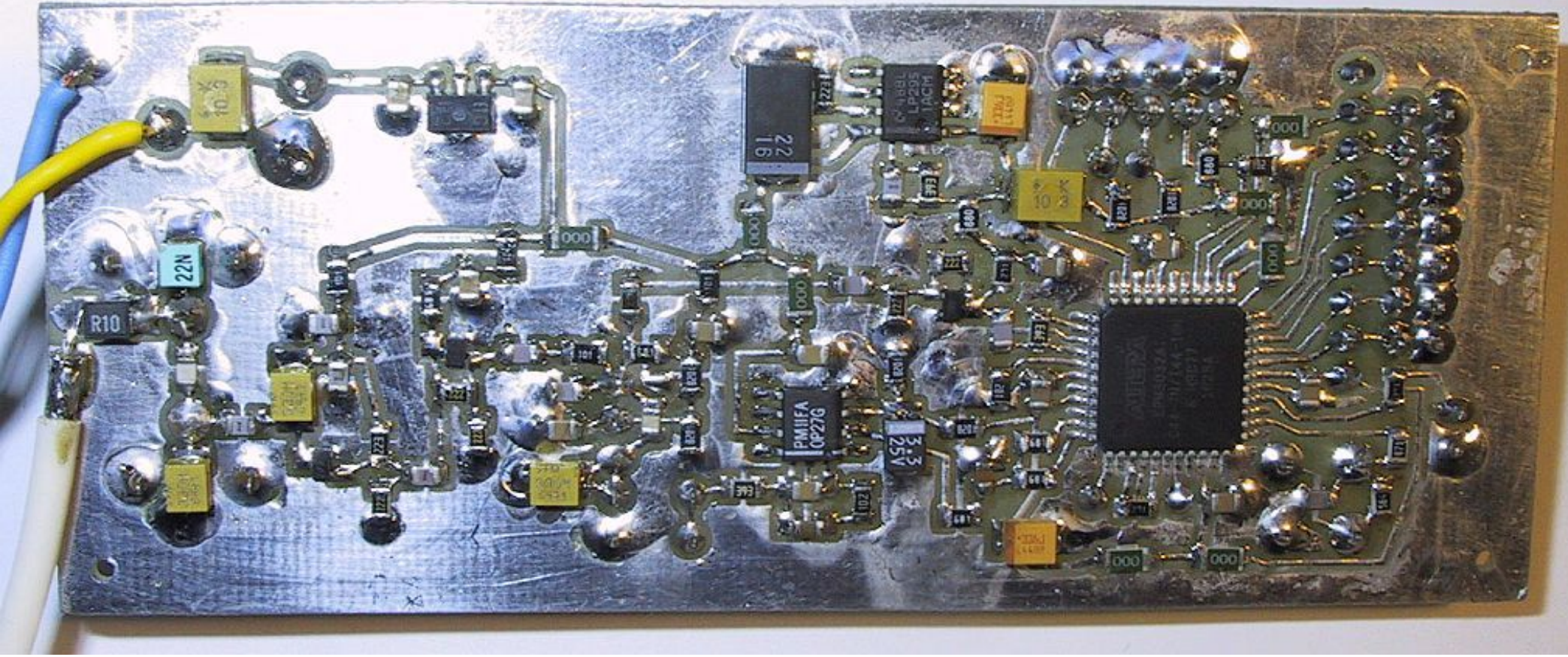
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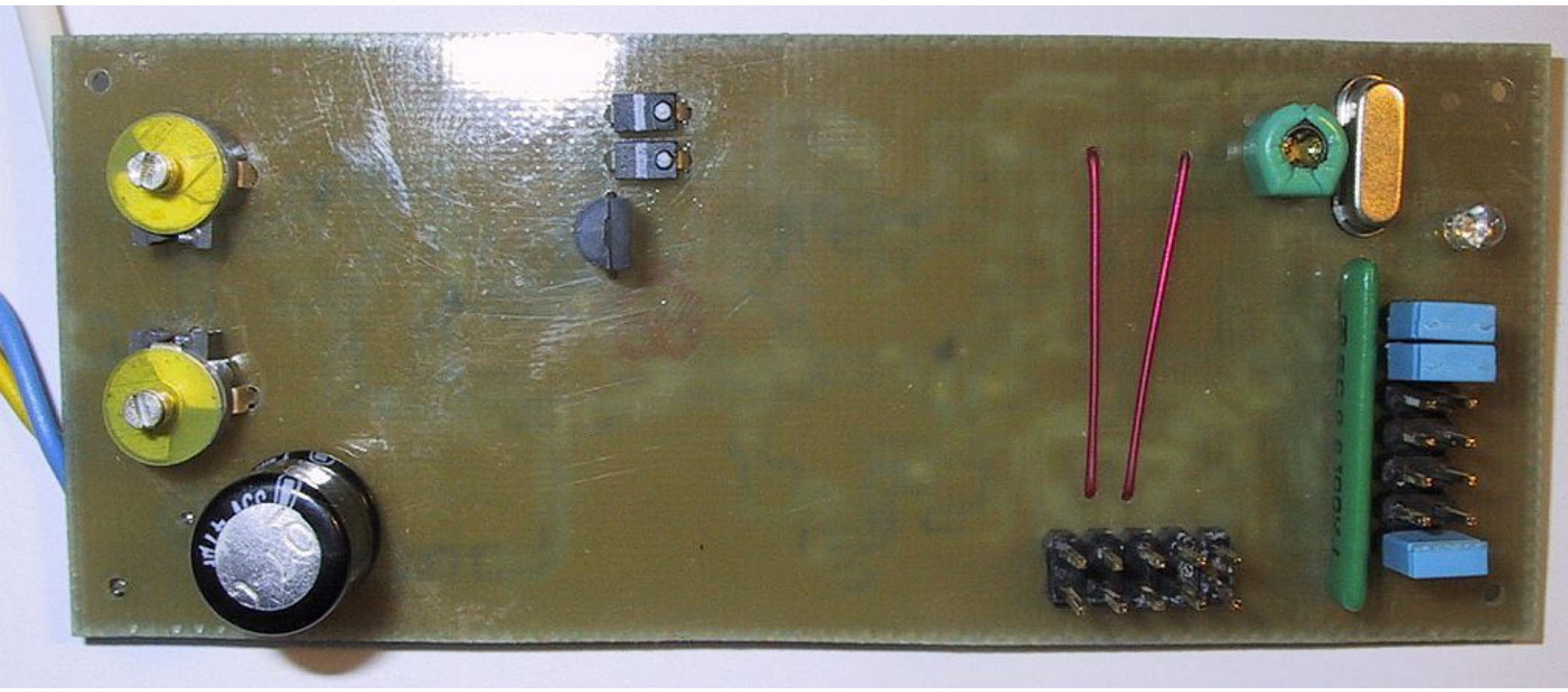
AoD



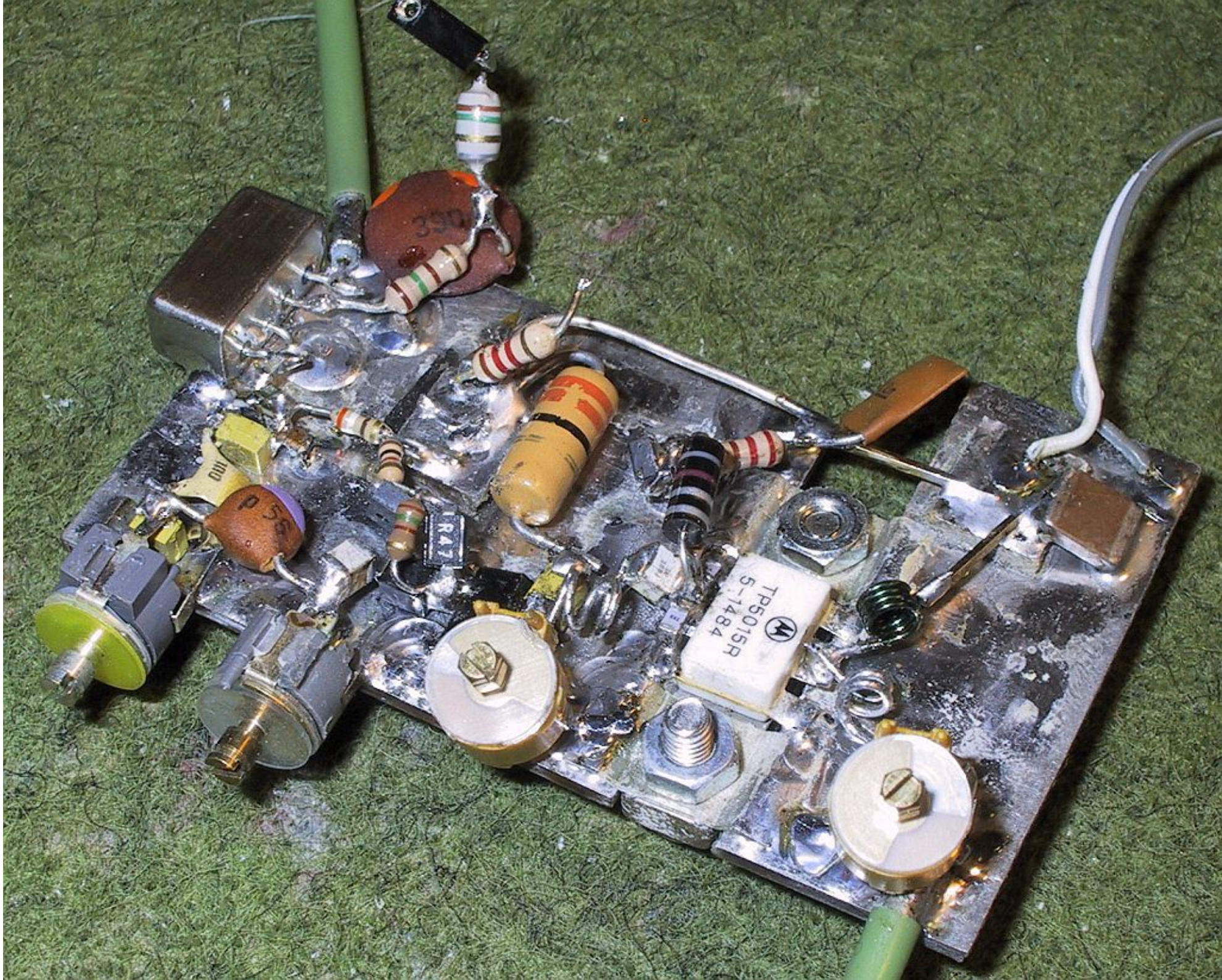
- divin
- (Global Clear)
- pol
- rfin

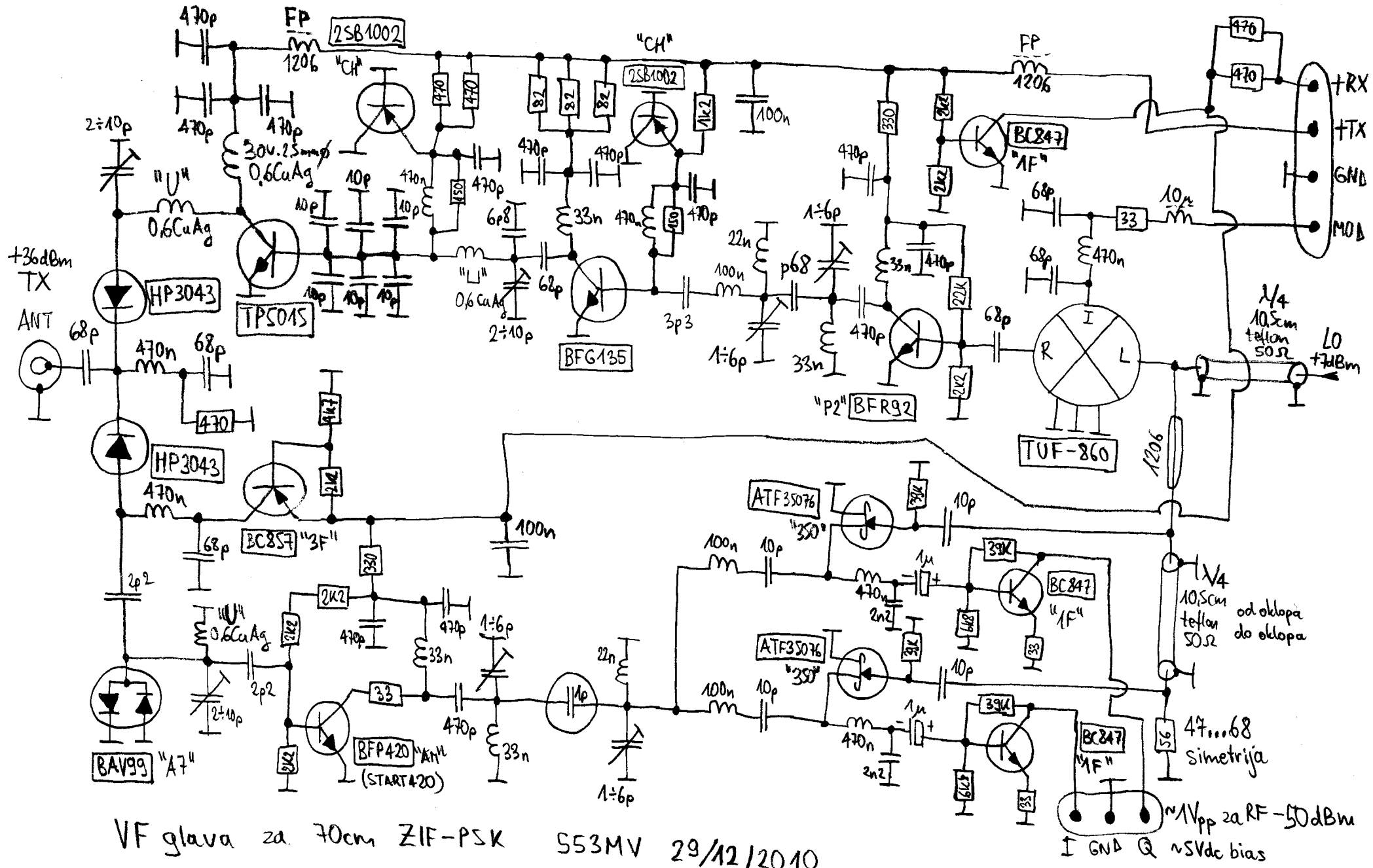


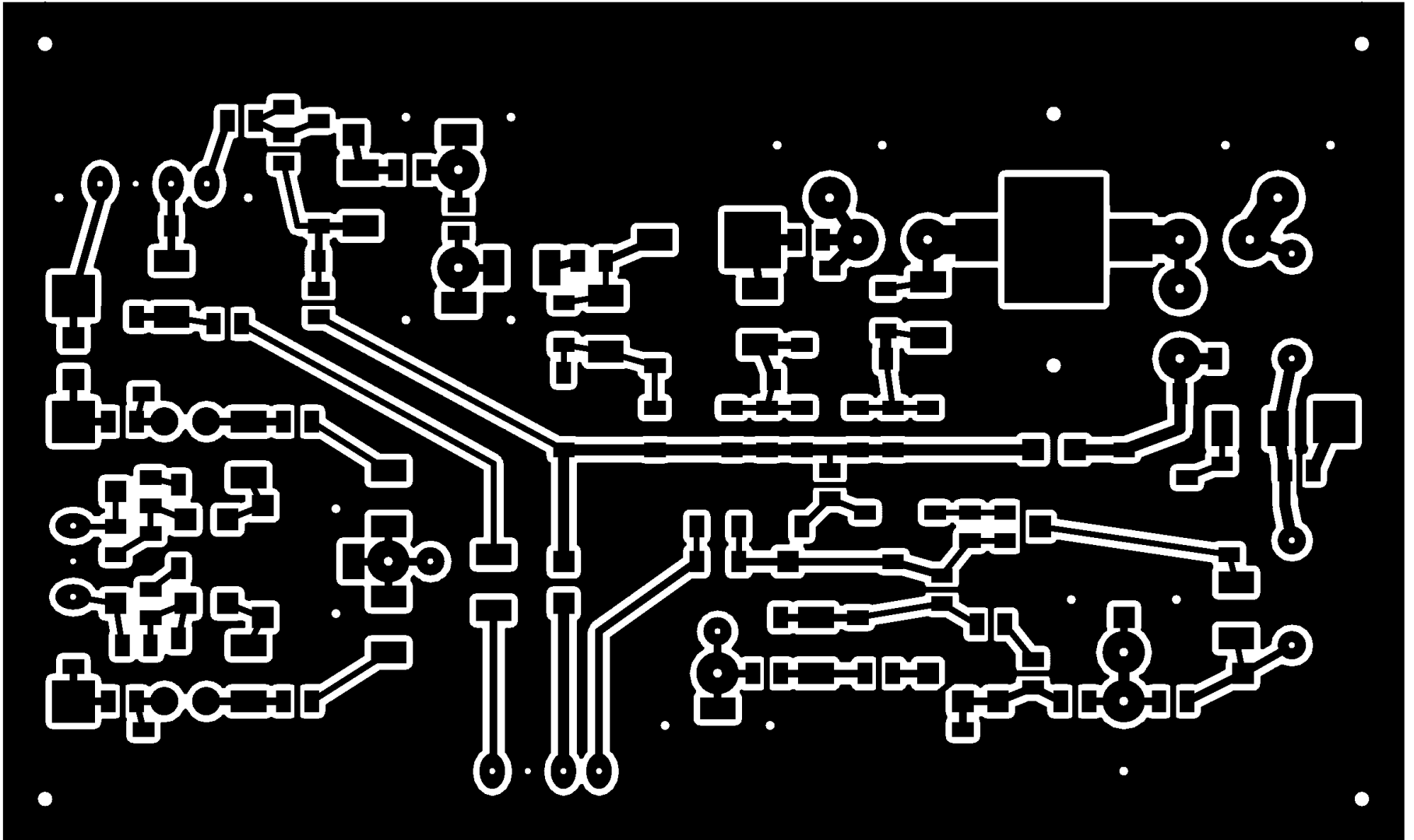


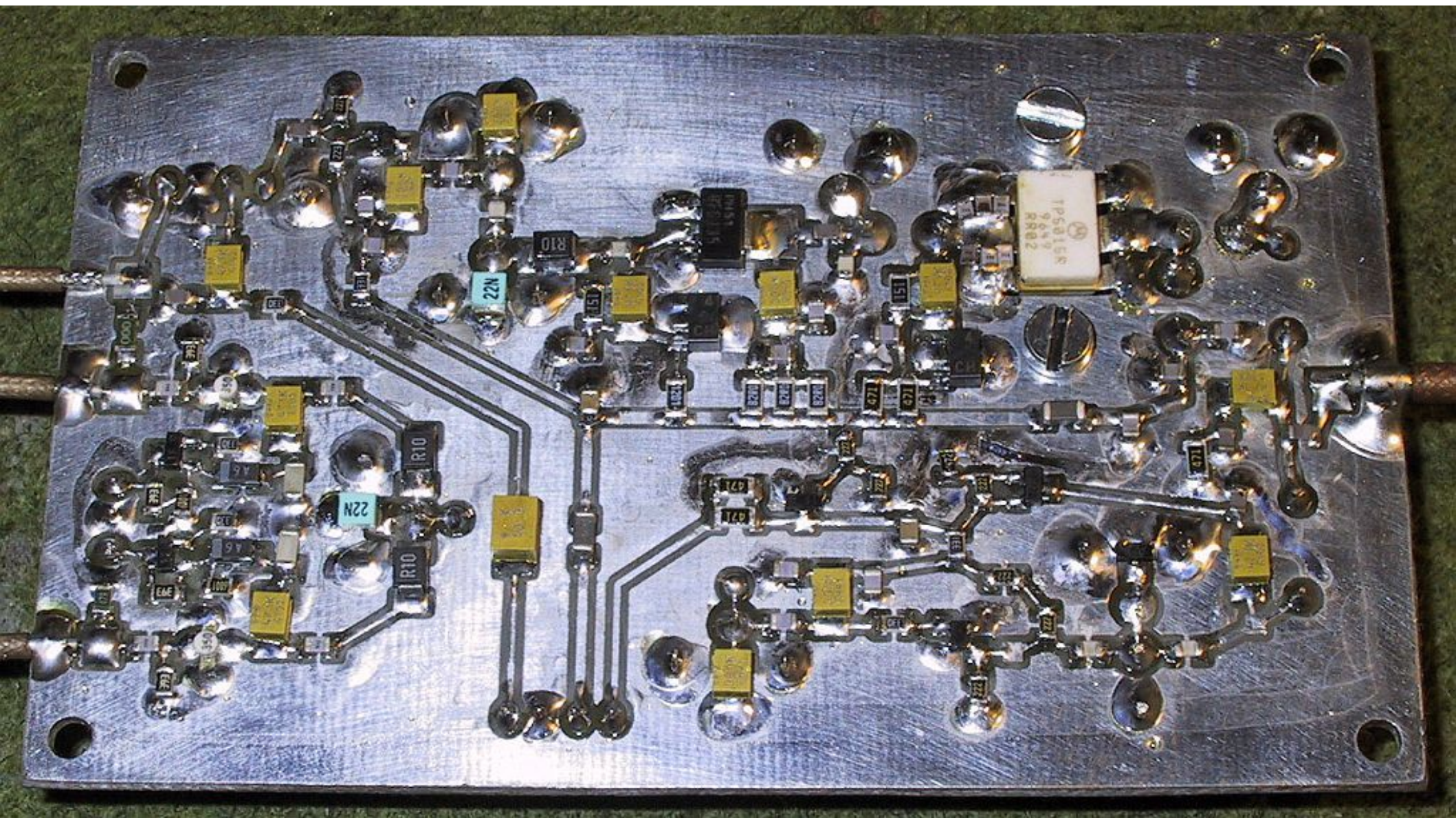


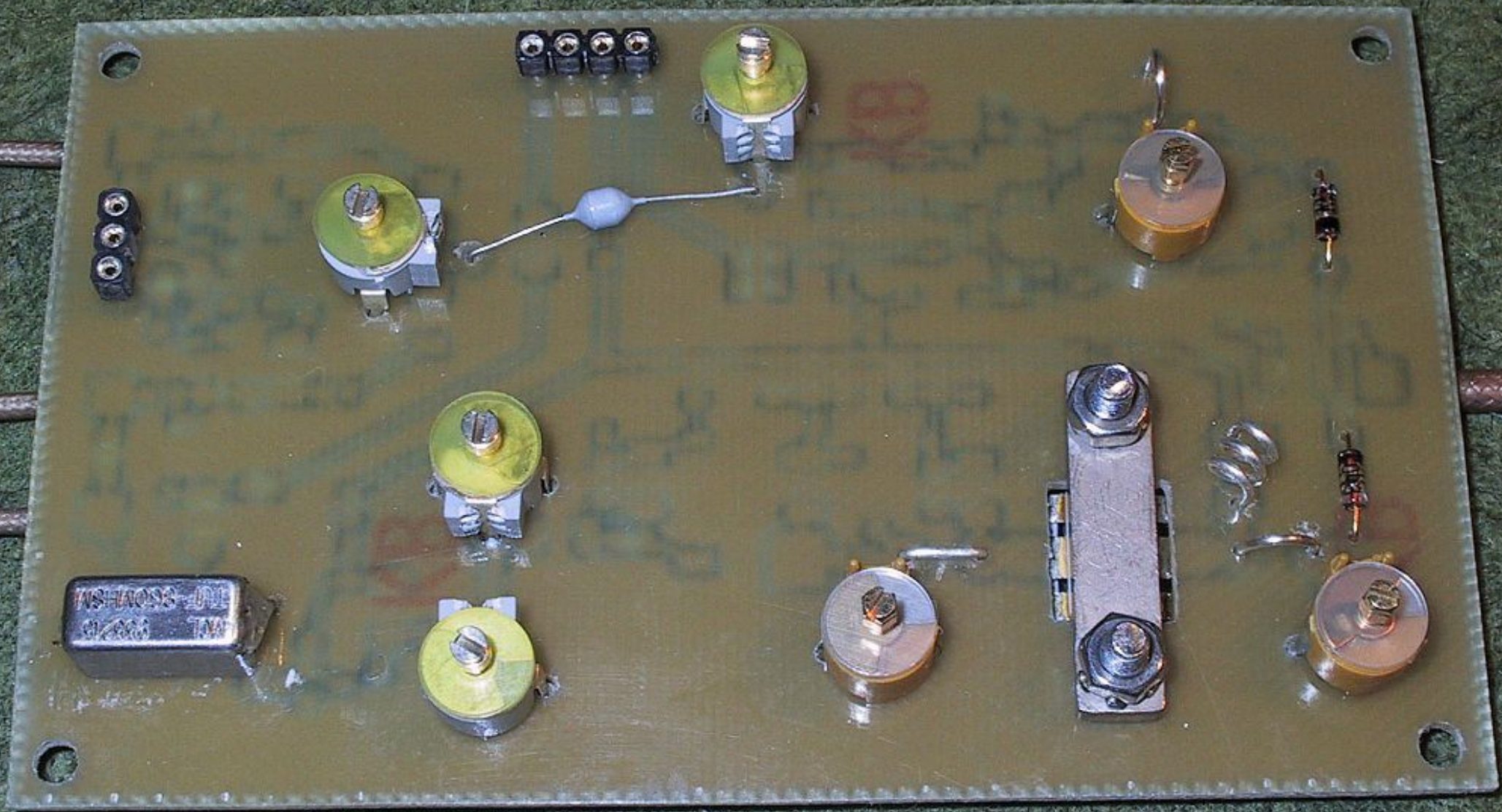




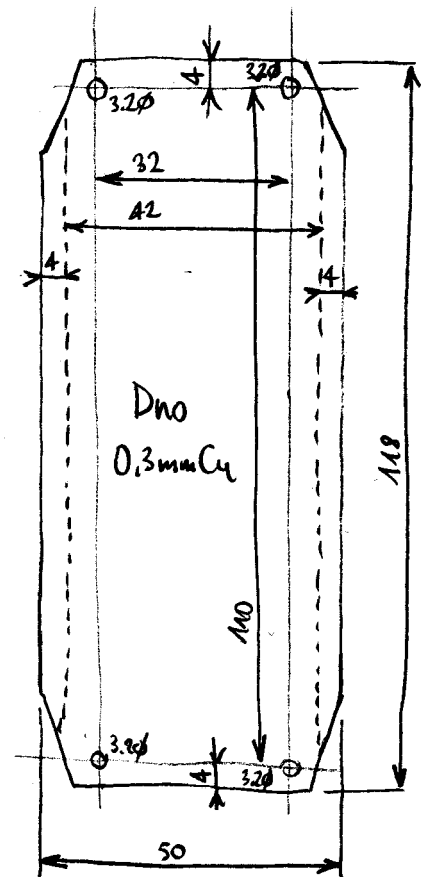
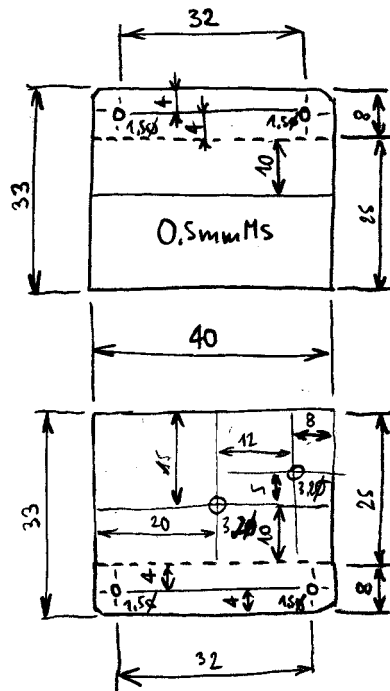
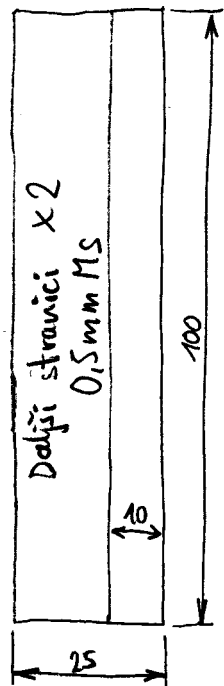
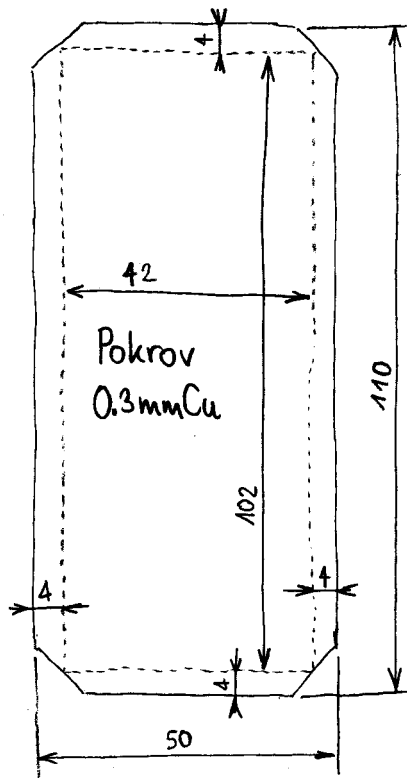






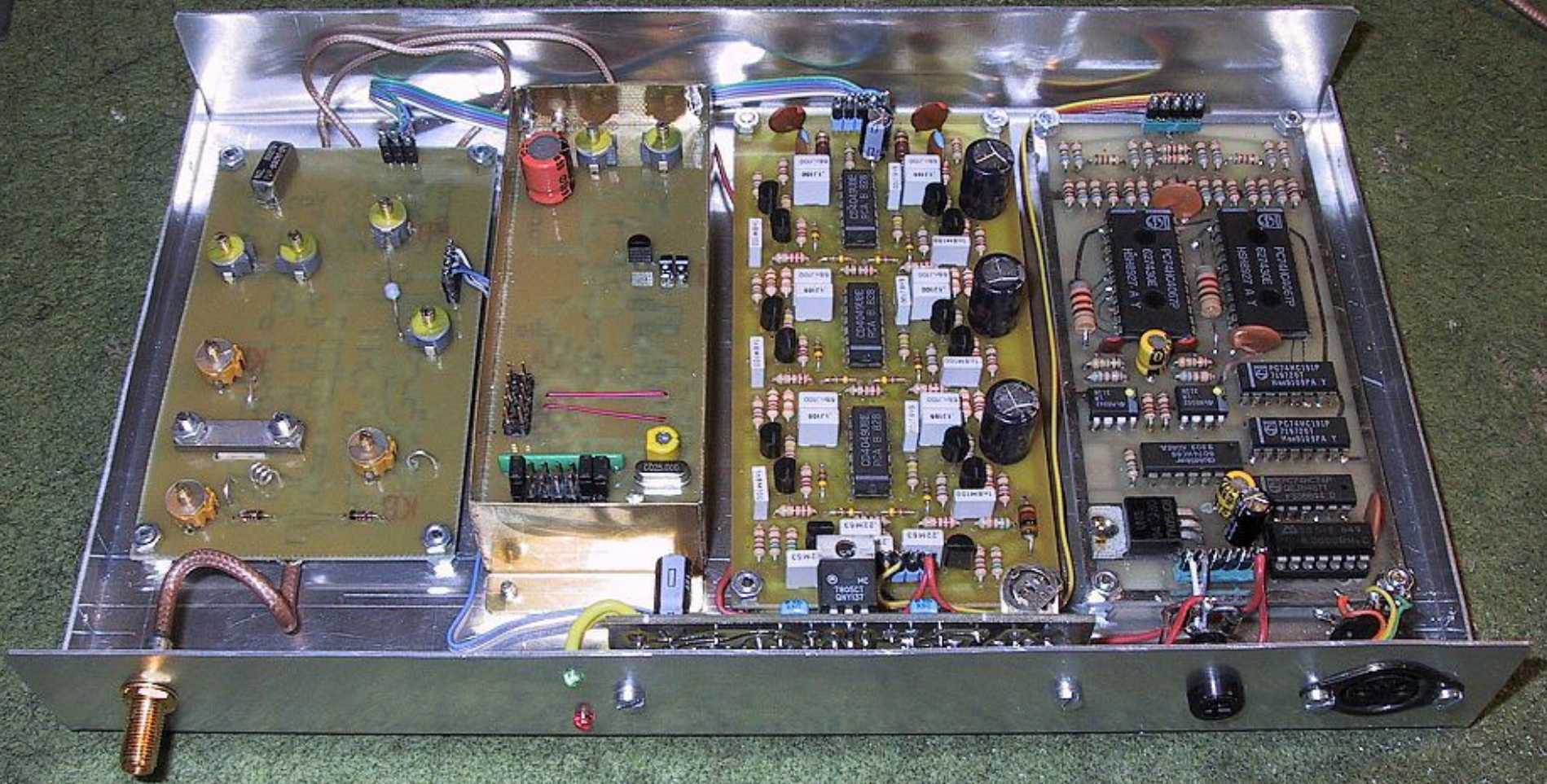


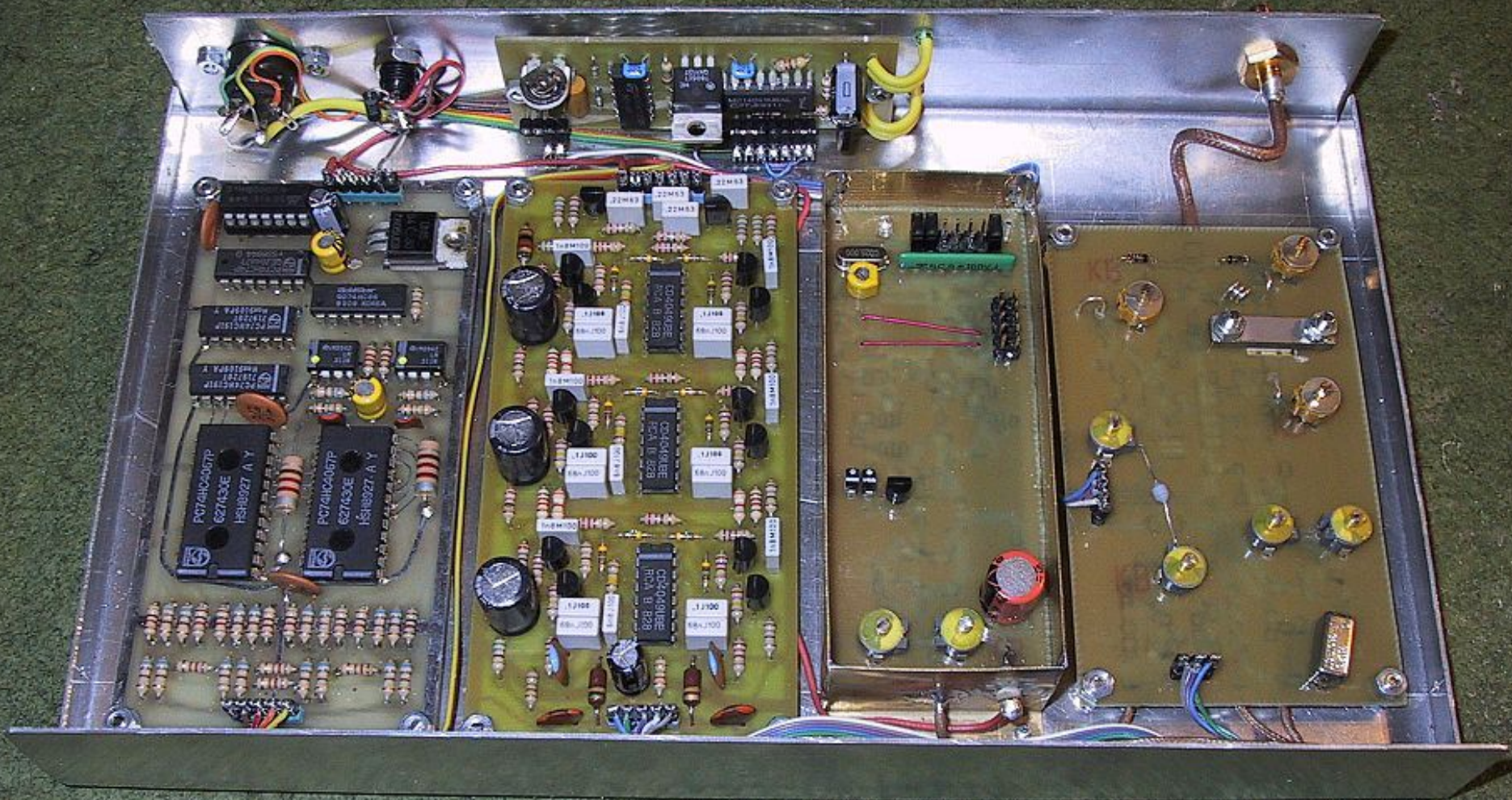




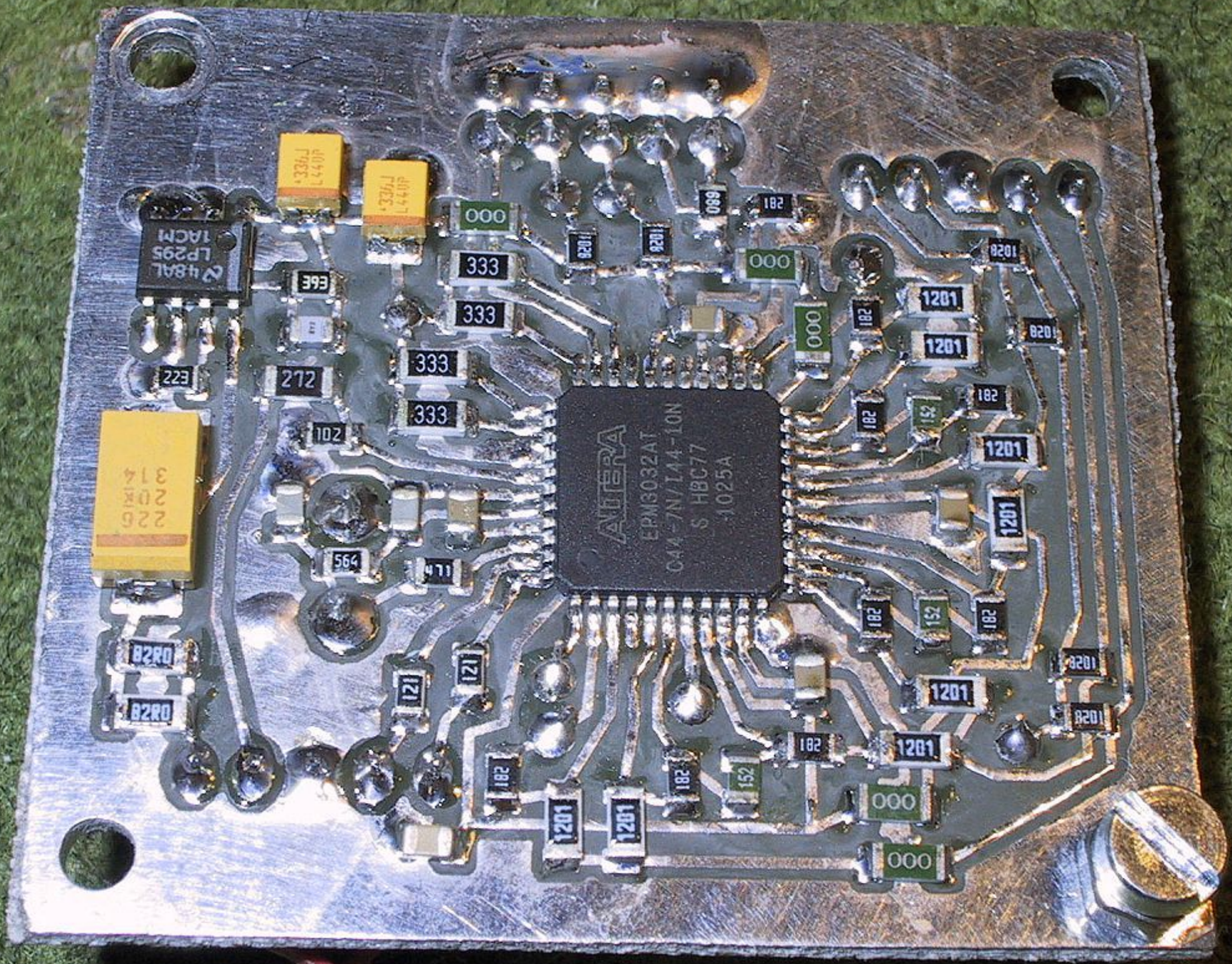
Oklop PLLja za 70cm PSK S53MV

2/1/2011









48AL
LP295
1ACM

ALTERA
EPM3032AT
C44-7V/LQ44-10N
S HBC77
-1025A

226
20X
314

336J
L440P

336J
L440P

820R
820R

564

471

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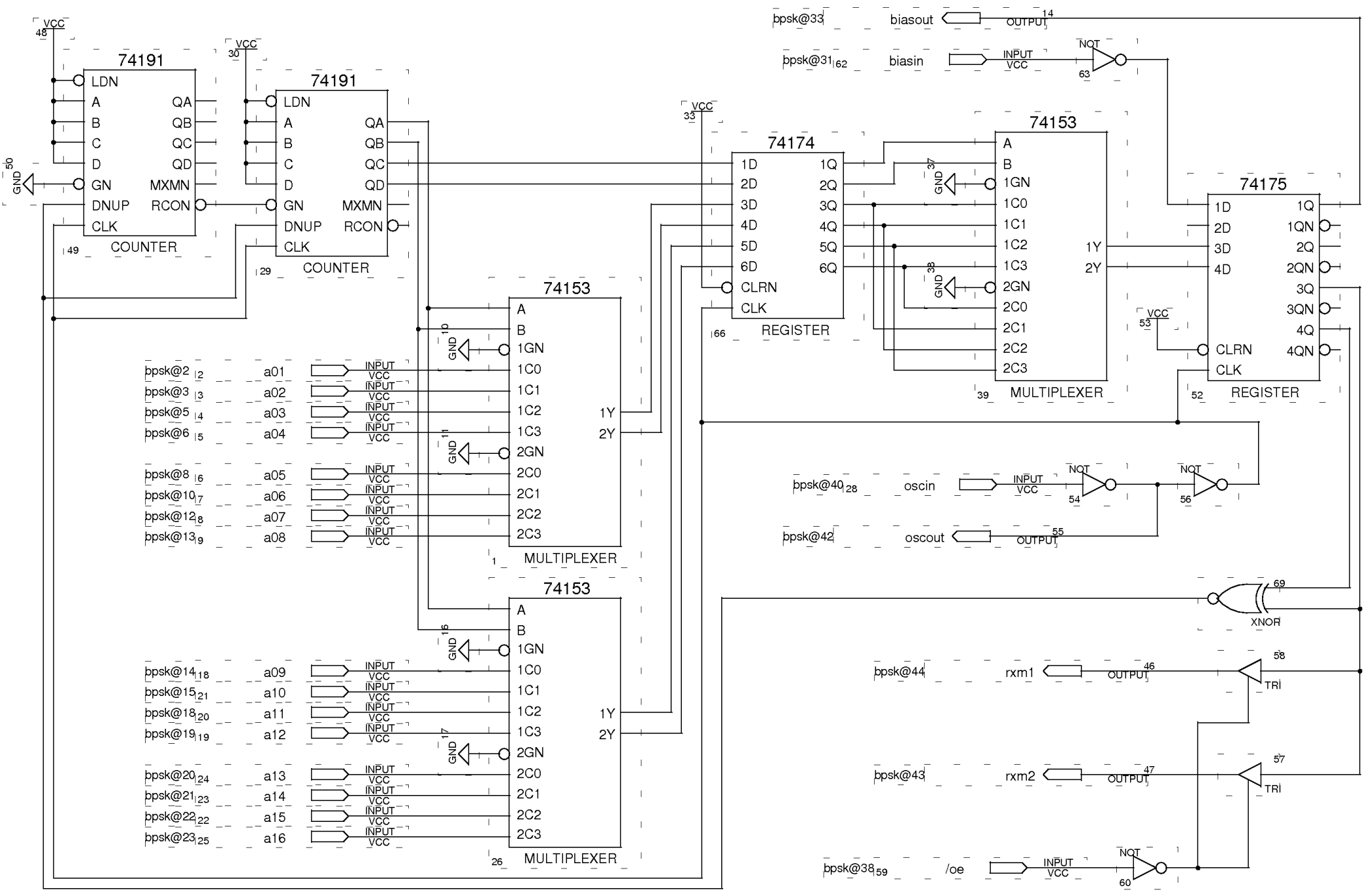
182

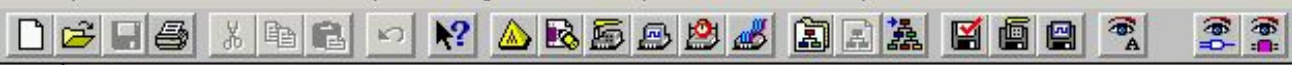
182

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(Last Compilation [Successful]) - Floorplan Editor

Chip Name:

Color Legend

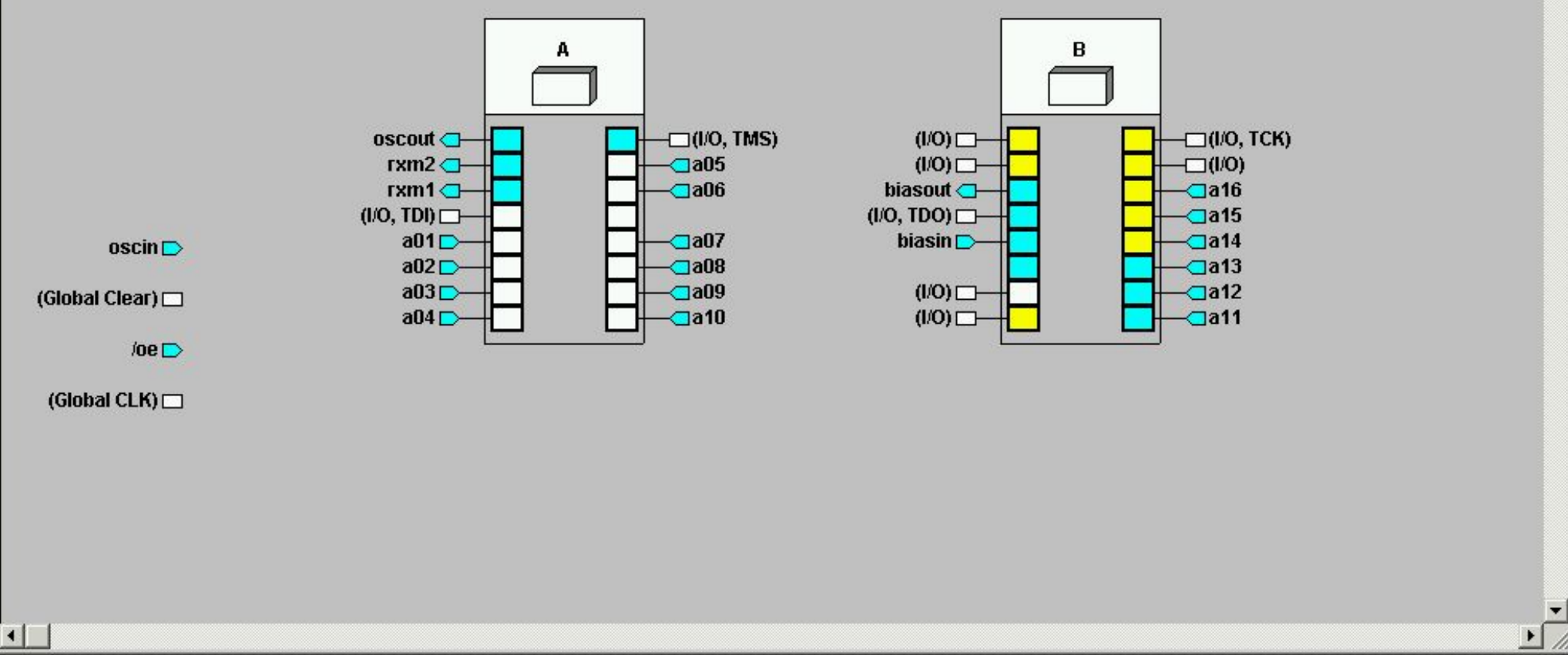
- Unassigned
- Device-Wide Fan-Out
- Unrouted
- Parallel Expanders
- Local LAB Fan-Out Only

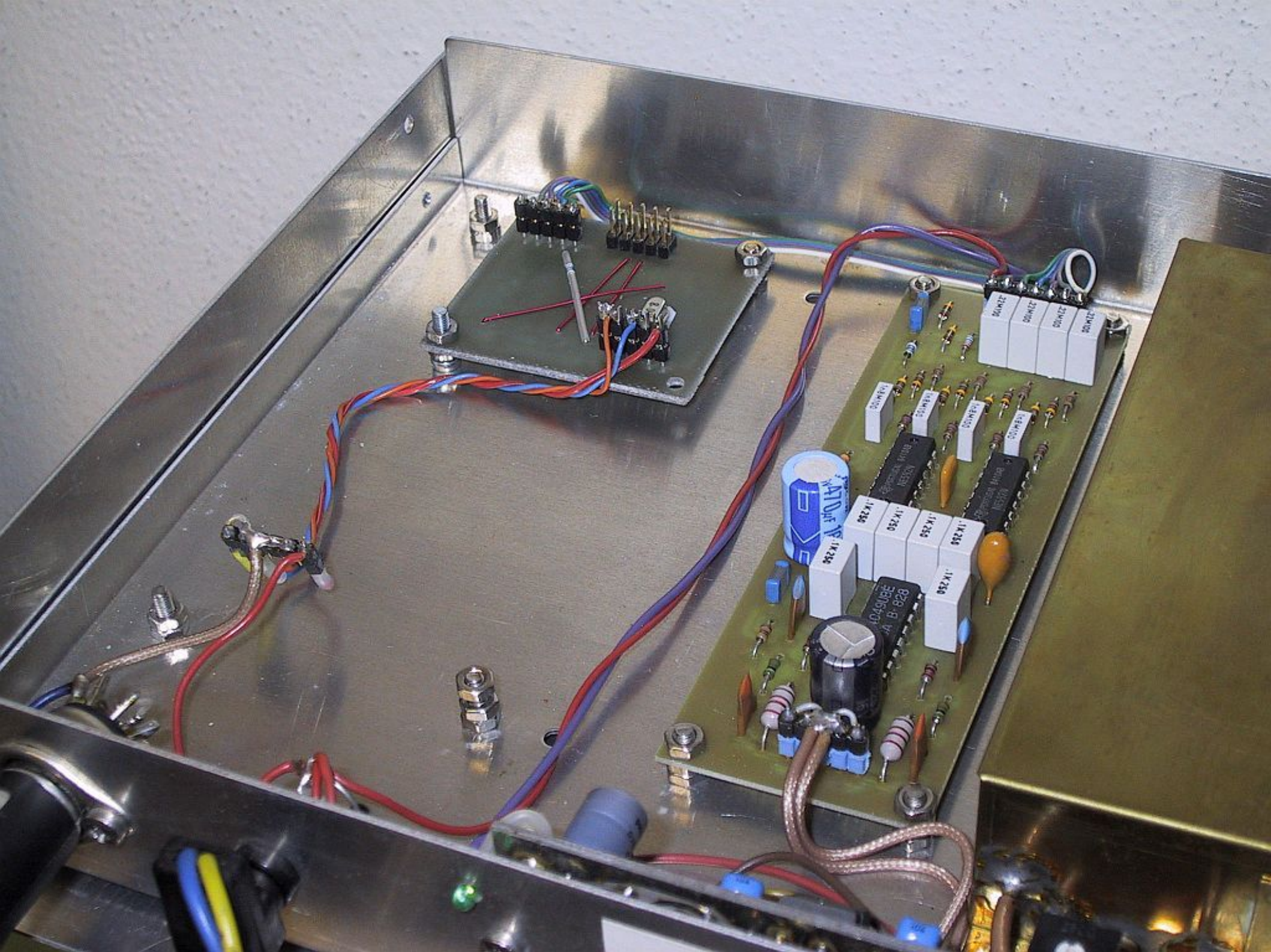
Unassigned Nodes & Pins:

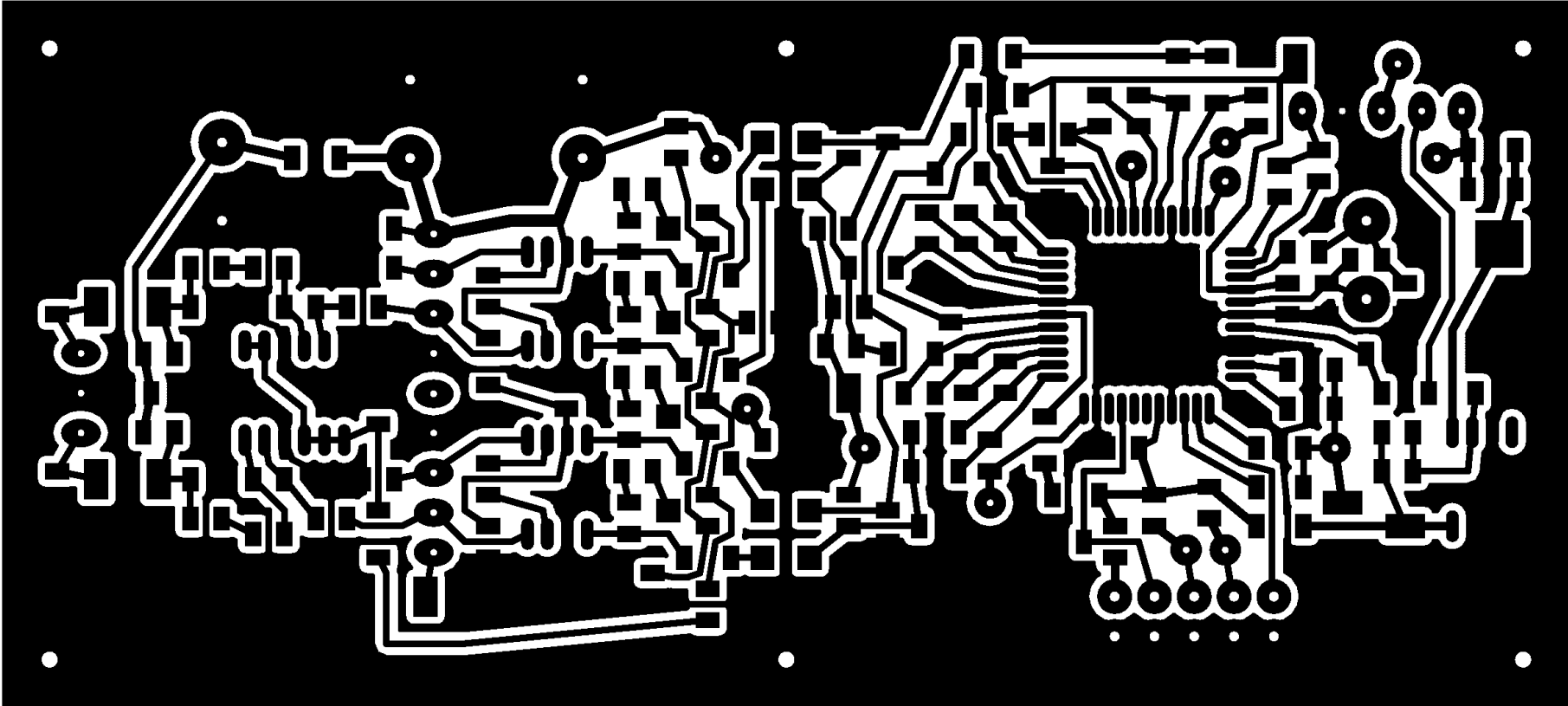
Selected Node(s) & Pin(s):

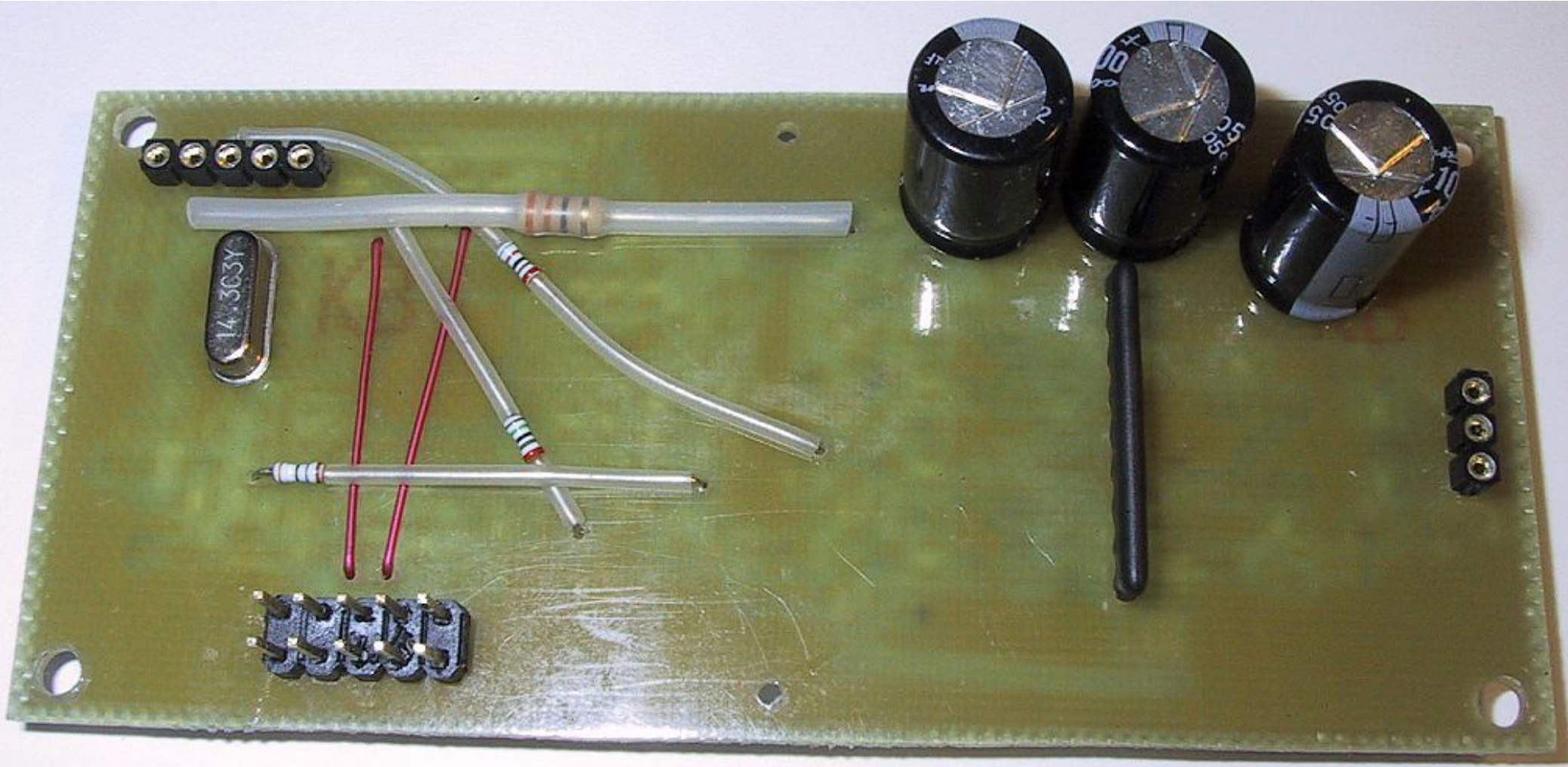
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AoD

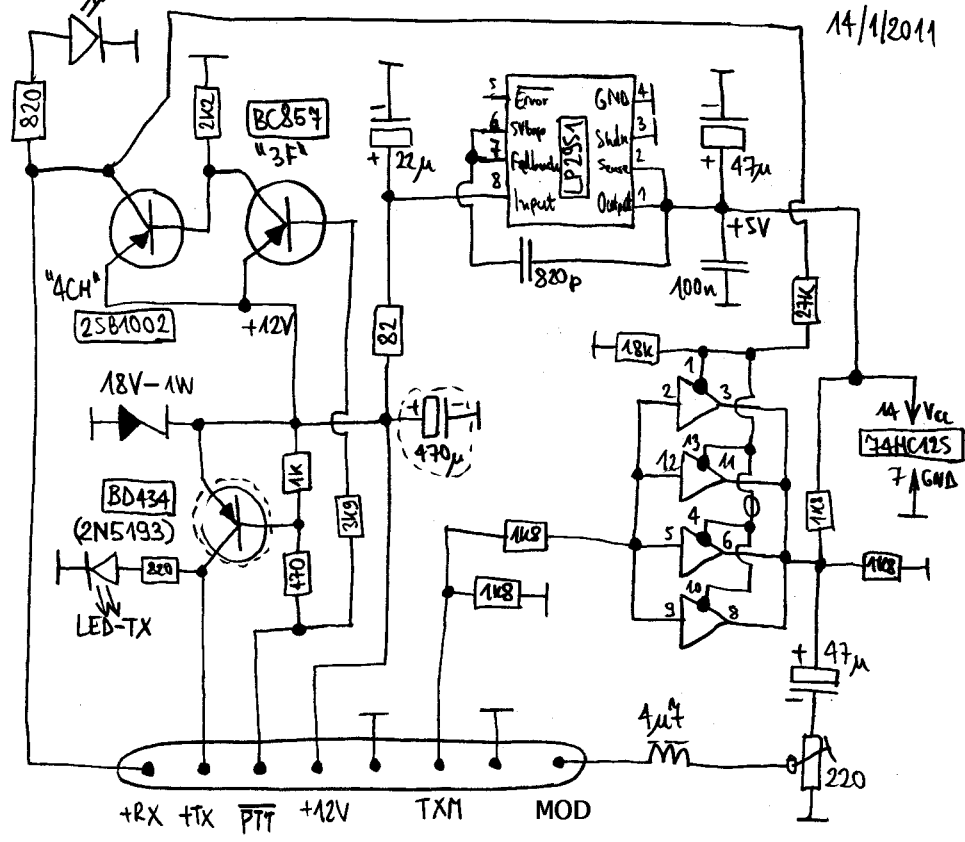


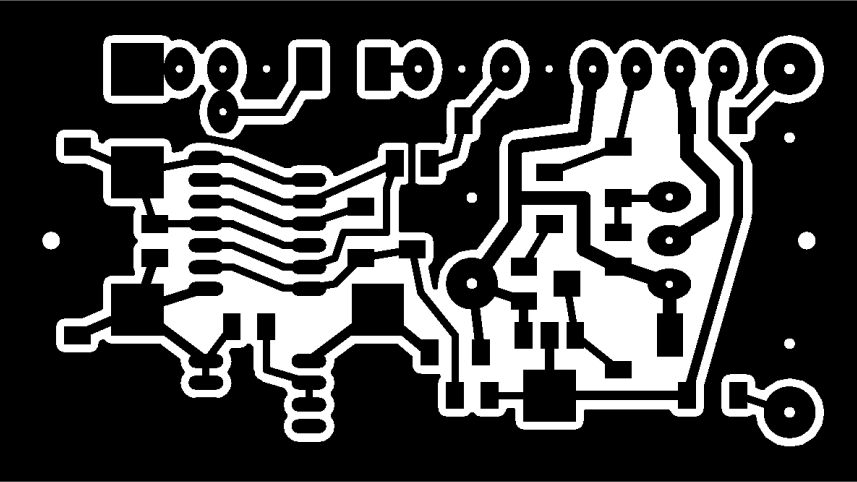


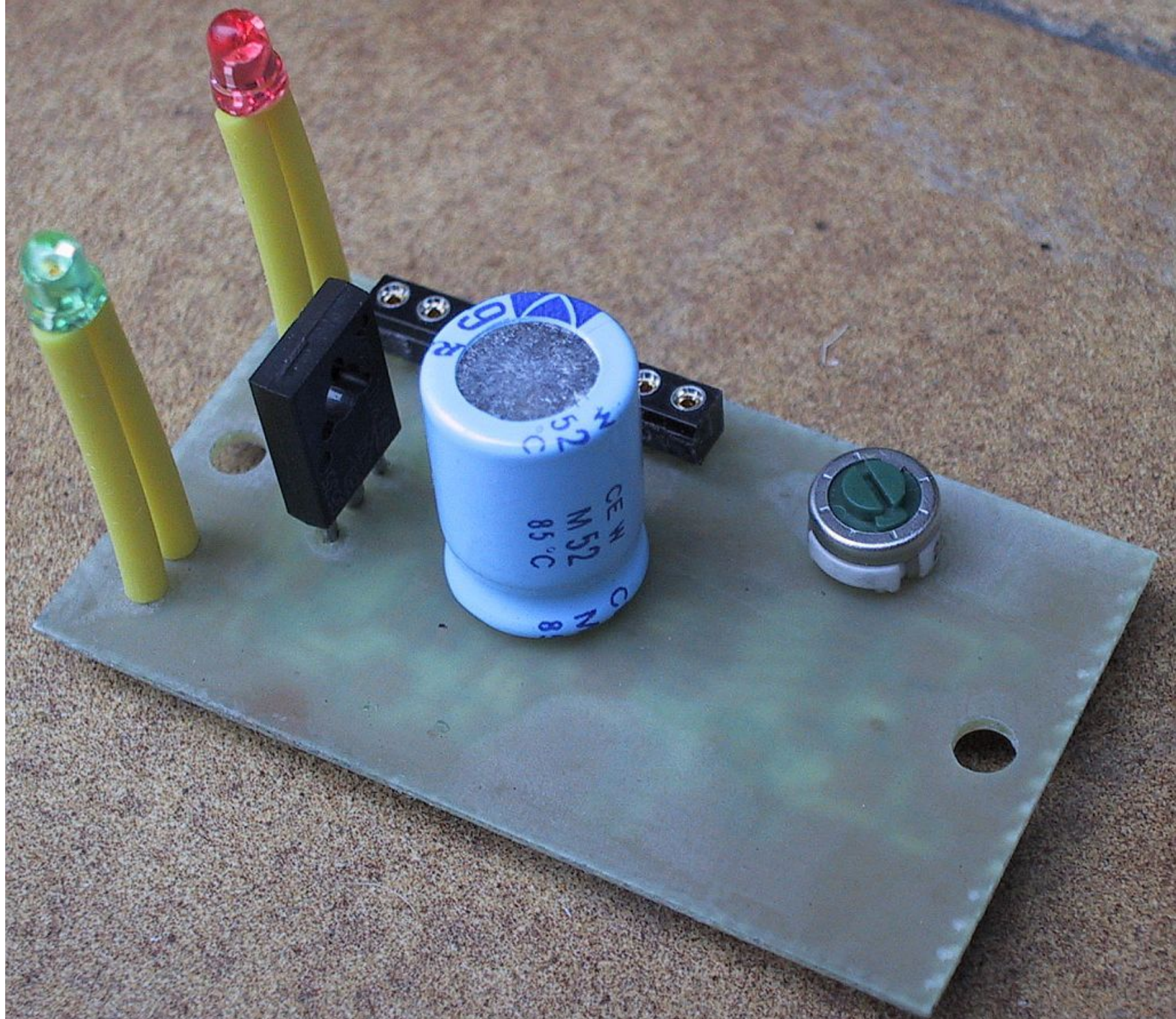


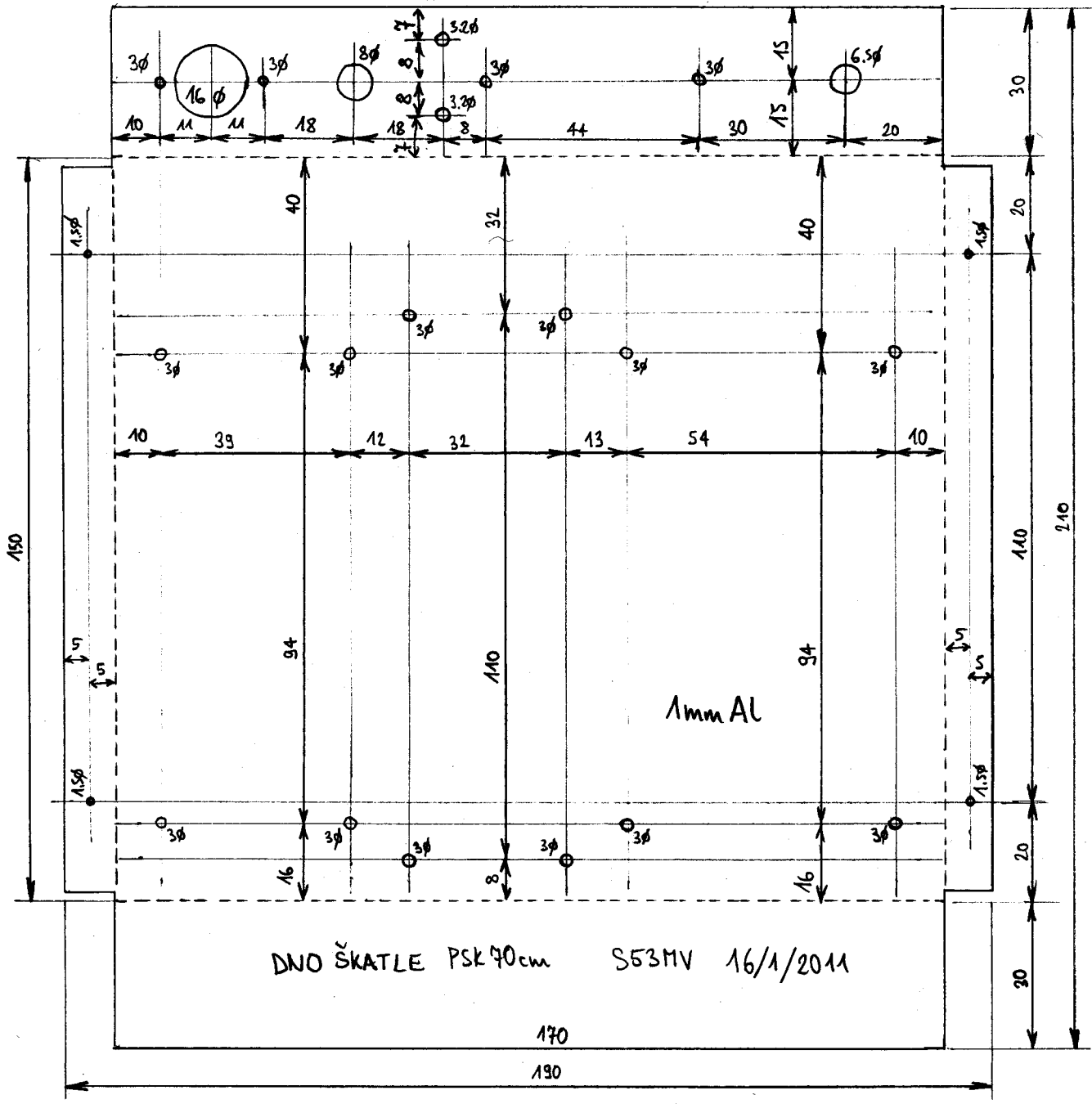


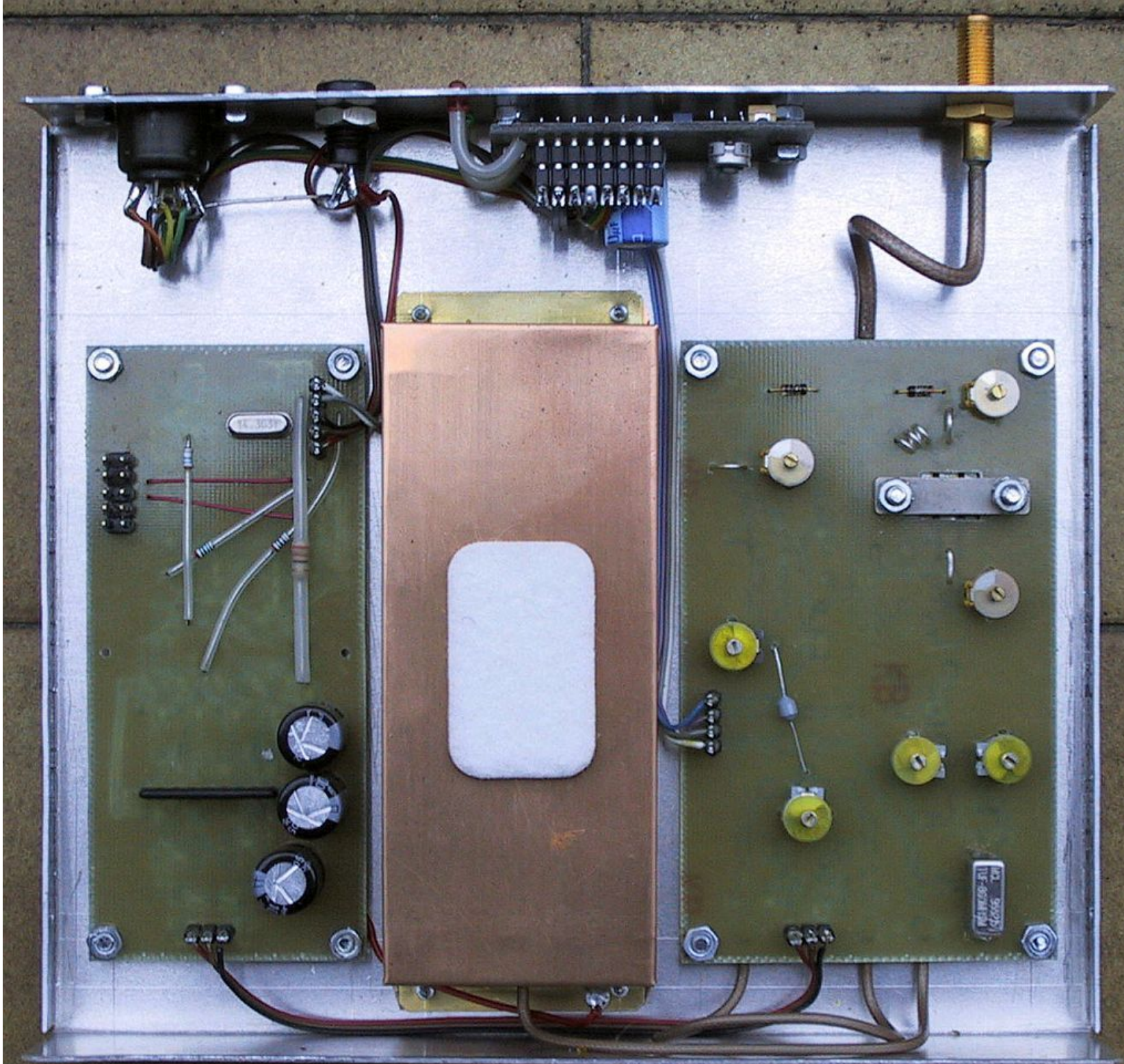
LED-RX Preklop RX/TX za BPSK postajo S53MV
 14/1/2011

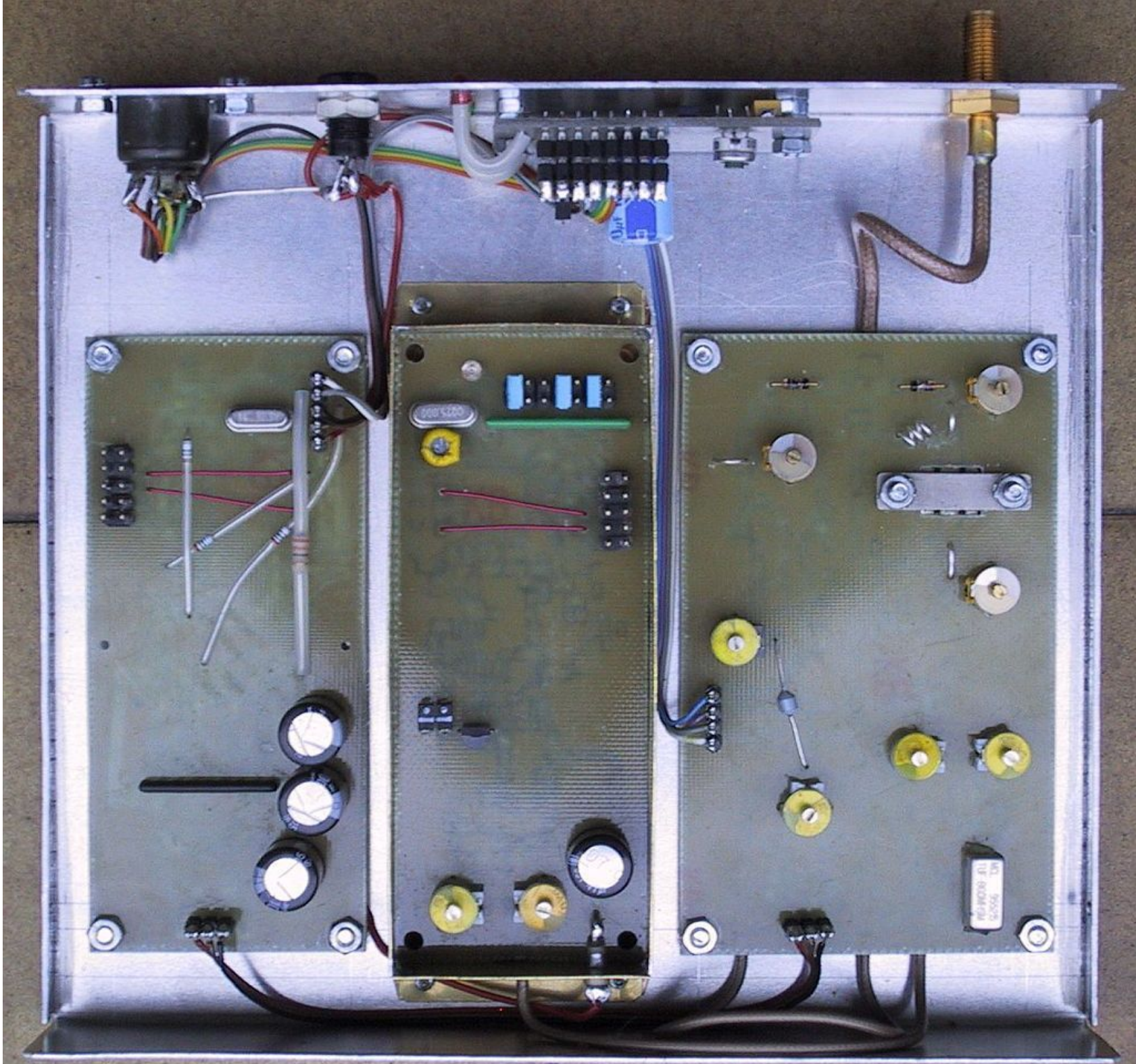


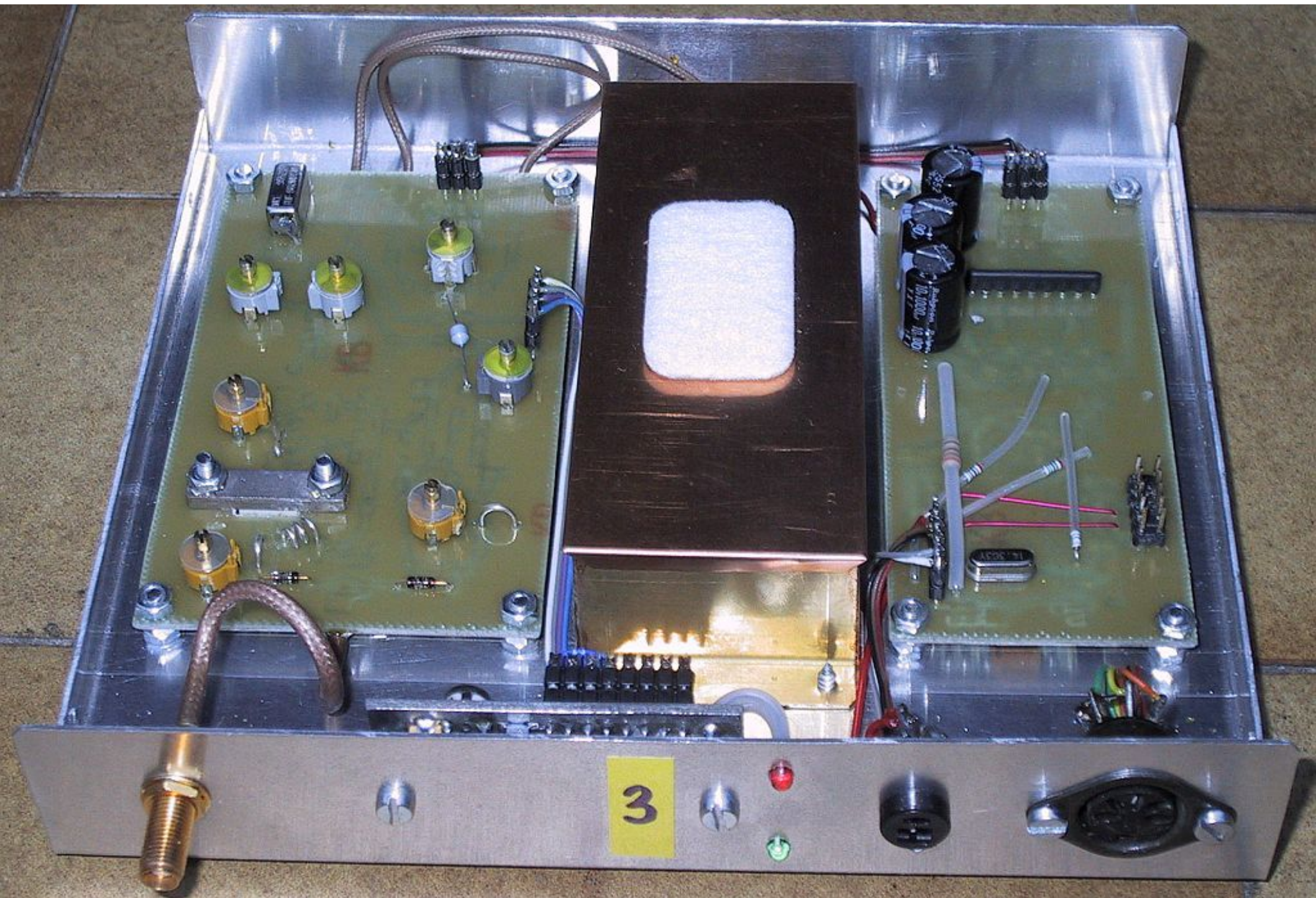


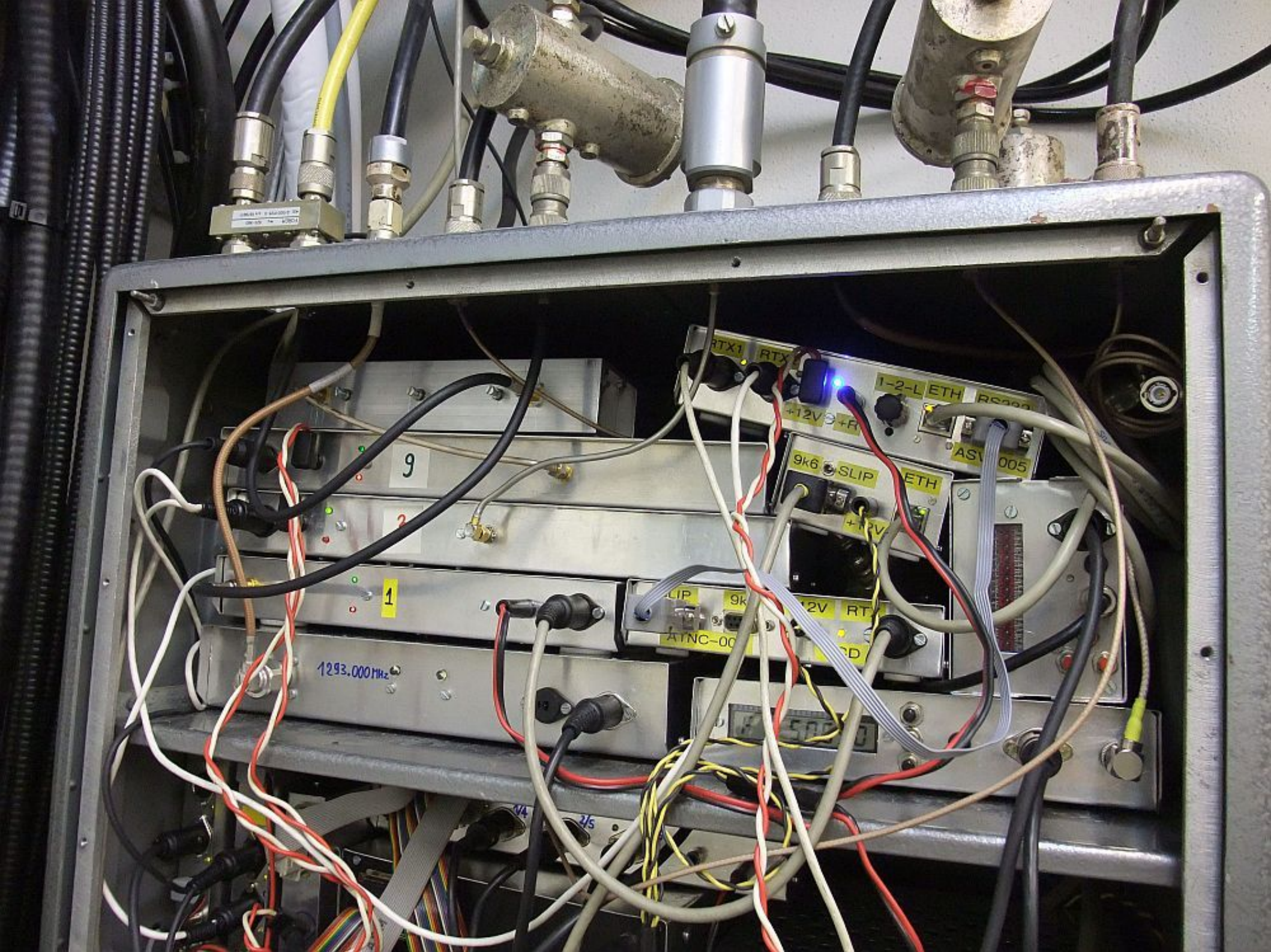












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1293.000MHz

RTX1 RTX

+12V +R

I-2-L ETH RS999

ETH

ETH

ETH

9K6 SLIP

SLIP 9K6 +12V RT

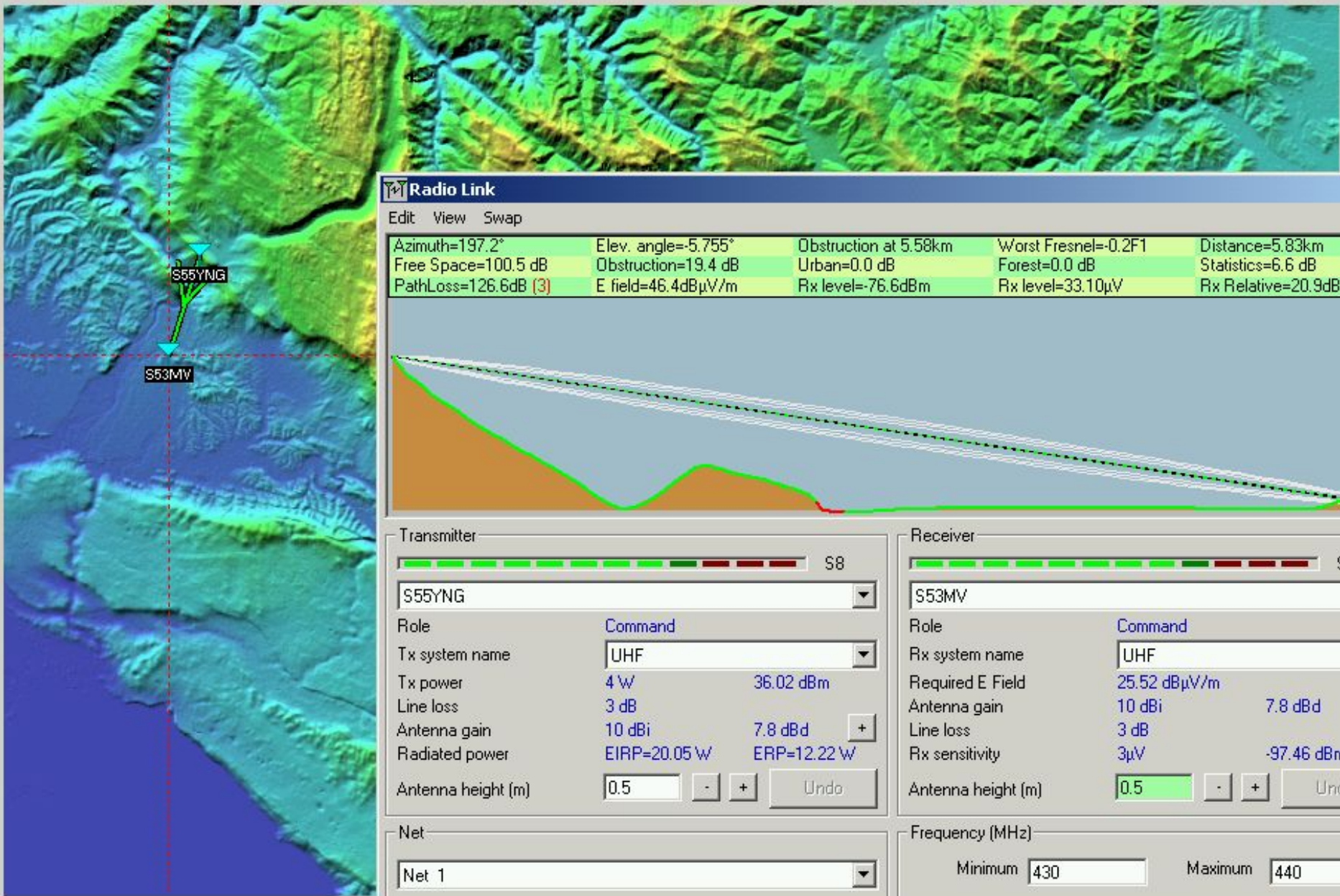
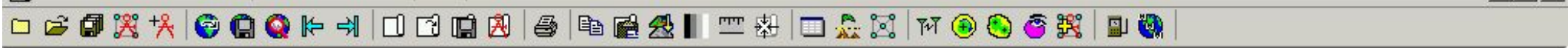
ATNC-00

ASV 005

500

70cmPSK





Radio Link

Edit View Swap

Azimuth=197.2°	Elev. angle=-5.755°	Obstruction at 5.58km	Worst Fresnel=-0.2F1	Distance=5.83km
Free Space=100.5 dB	Obstruction=19.4 dB	Urban=0.0 dB	Forest=0.0 dB	Statistics=6.6 dB
PathLoss=126.6dB (3)	E field=46.4dBμV/m	Rx level=-76.6dBm	Rx level=33.10μV	Rx Relative=20.9dB

Transmitter

S55YNG

Role: UHF

Tx system name: UHF

Tx power: 4 W (36.02 dBm)

Line loss: 3 dB

Antenna gain: 10 dBi (7.8 dBd)

Radiated power: EIRP=20.05 W (ERP=12.22 W)

Antenna height (m): 0.5

Receiver

S53MV

Role: UHF

Rx system name: UHF

Required E Field: 25.52 dBμV/m

Antenna gain: 10 dBi (7.8 dBd)

Line loss: 3 dB

Rx sensitivity: 3μV (-97.46 dBm)

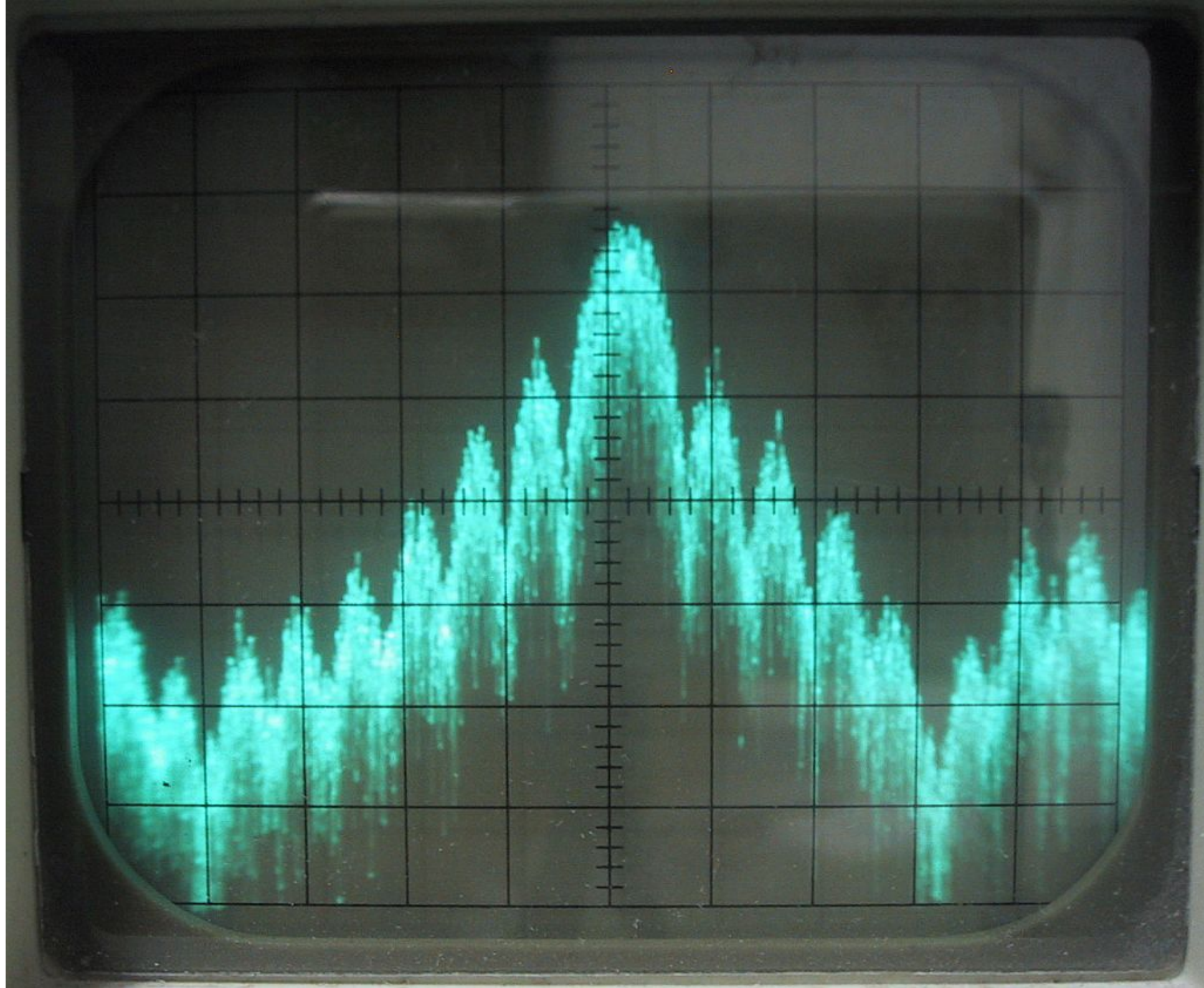
Antenna height (m): 0.5

Net

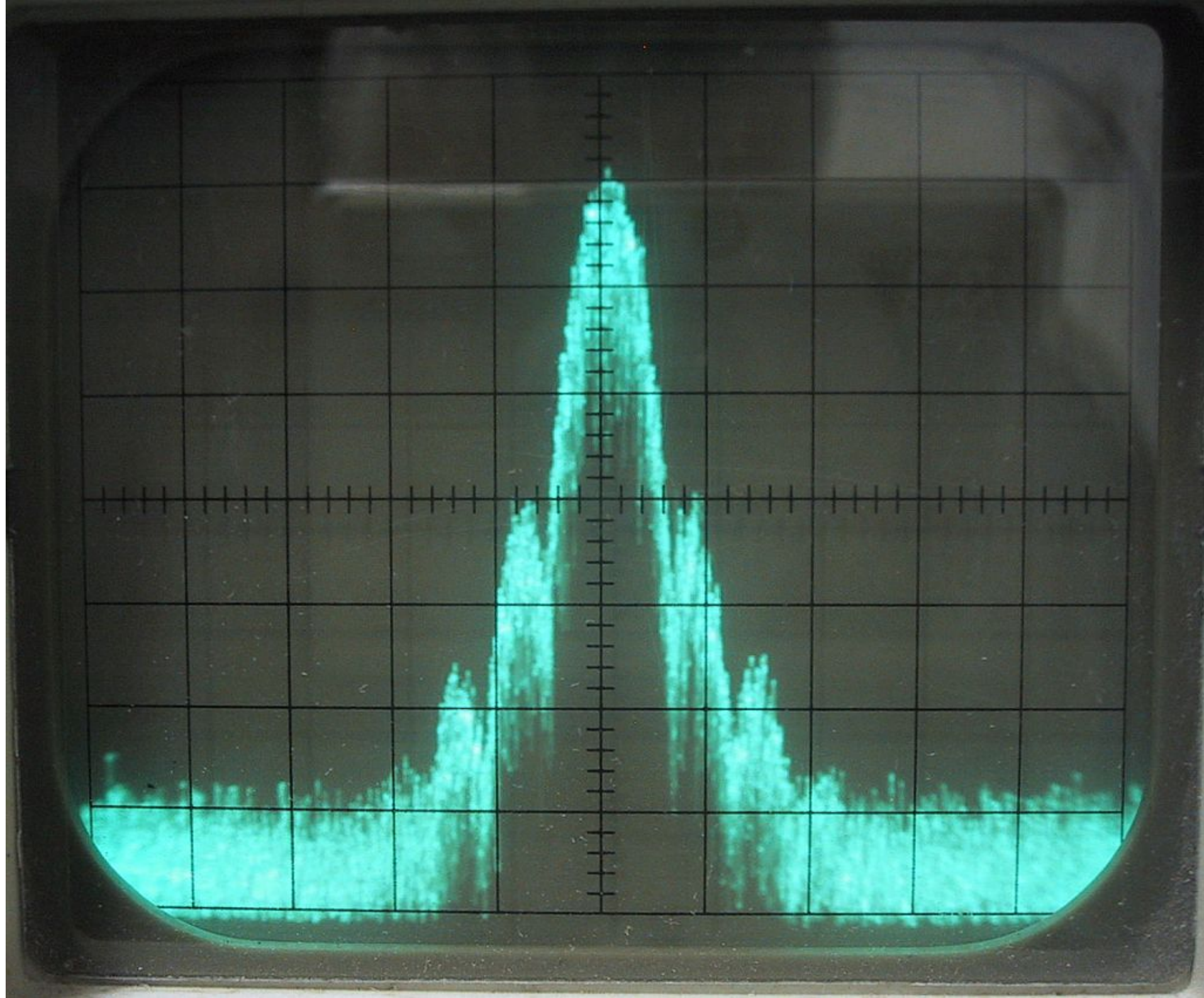
Net 1

Frequency (MHz)

Minimum: 430 Maximum: 440







MOTNJE NA VHODU FM REPETITORJEV V PASU 430-432MHz

RAZLIČNA POLARIZACIJA -20dB
(FM=VP, BPSK=HP)

RAZLIČNA PASOVNA ŠIRINA -20dB
($B_{BPSK} = 100 \cdot B_{FM}$)

S/N_{MIN} ZA FM DEMODULATOR +10dB

SKUPNO SLABLJENJE -30dB
ALI RAZMERJE MOČI 1/1000

DOMET REPETITORJA 100km

UPADANJE MOČI 1/SQRT(1000)

ŠKODLJIVI DOMET MOTILCA 3km

...V PRAKSI ŠE DOSTI MANJ
ZARADI SLABIH DUPEKSERJEV IN
USTREZNO MANJŠE OBČUTLJIVOSTI
REPETITORJEV

MOTNJE OZKOPASOVNIM CW/SSB POSTAJAM V PASU 432.0-432.4MHz

ISTA POLARIZACIJA (HP) 0dB

RAZLIČNA PASOVNA ŠIRINA -30dB
($B_{BPSK} = 1000 \cdot B_{SSB}$)

IZKORIŠČANJE PRVE NIČLE -30dB
SPEKTRA BPSK MODULACIJE
($f_{BPSK} = 430.800\text{MHz}$)

SKUPNO SLABLJENJE -60dB
ALI RAZMERJE MOČI 1/1000000

MOČ BPSK ODDAJNIKA 4w
(+36dBm)

NAVIDEZNA MOČ MOTILCA 4μw
(-24dBm)

...JE ZA NEKAJ VELIKOSTNIH
RAZREDOV MANJŠA OD "ŠPRICANJA"
QRO POSTAJ V TEKMOVANJU

OCENA MOTENJ DRUGIM UPORABNIKOM V PASU 430-440MHz