Zařízení pro práci v pásmu 122GHz

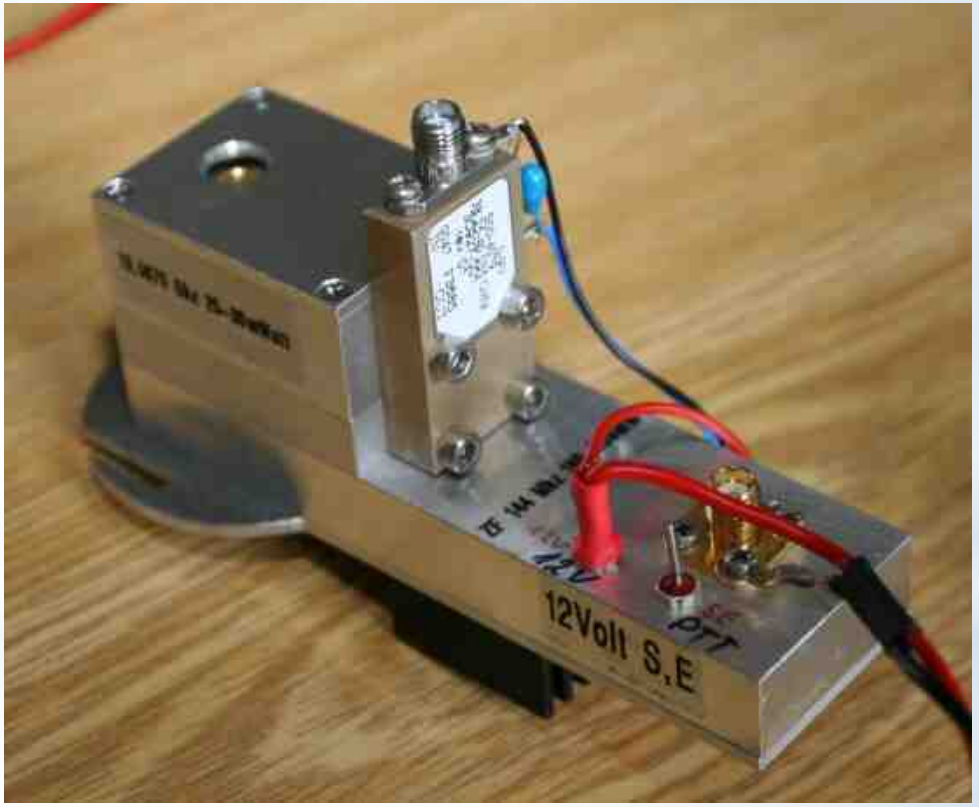
Troška historie nikoho nezabije

Počátky vysílání v pásmu 122GHz na severní Moravě – 2008

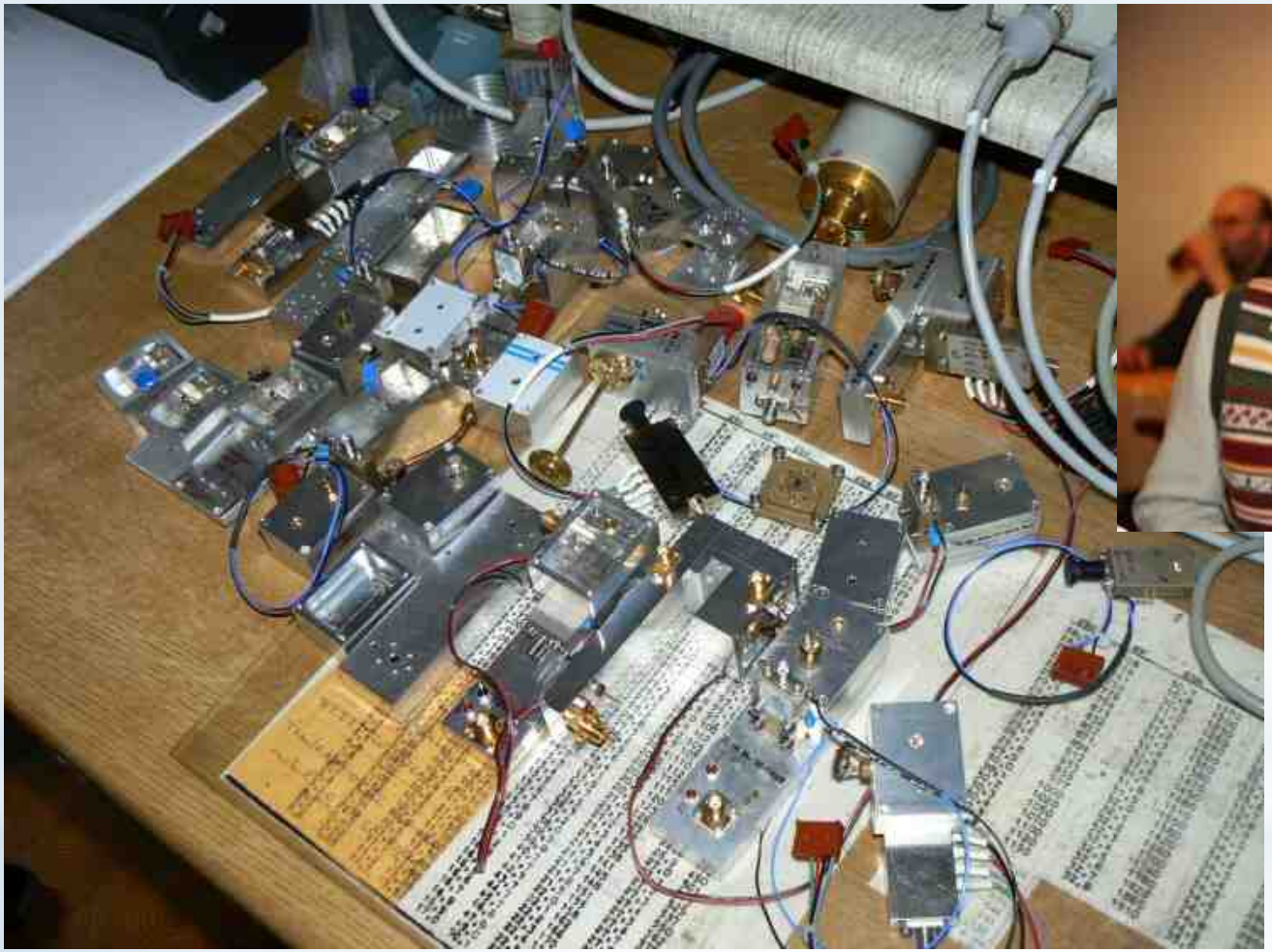
- Pavel, OK2VJC
- Petr, OK2ULQ
- Milan, OK2IMH

- Franta, OK2QI
- Luboš, OK2LL

- Boris, OK2QW



Troška historie nikoho nezabije

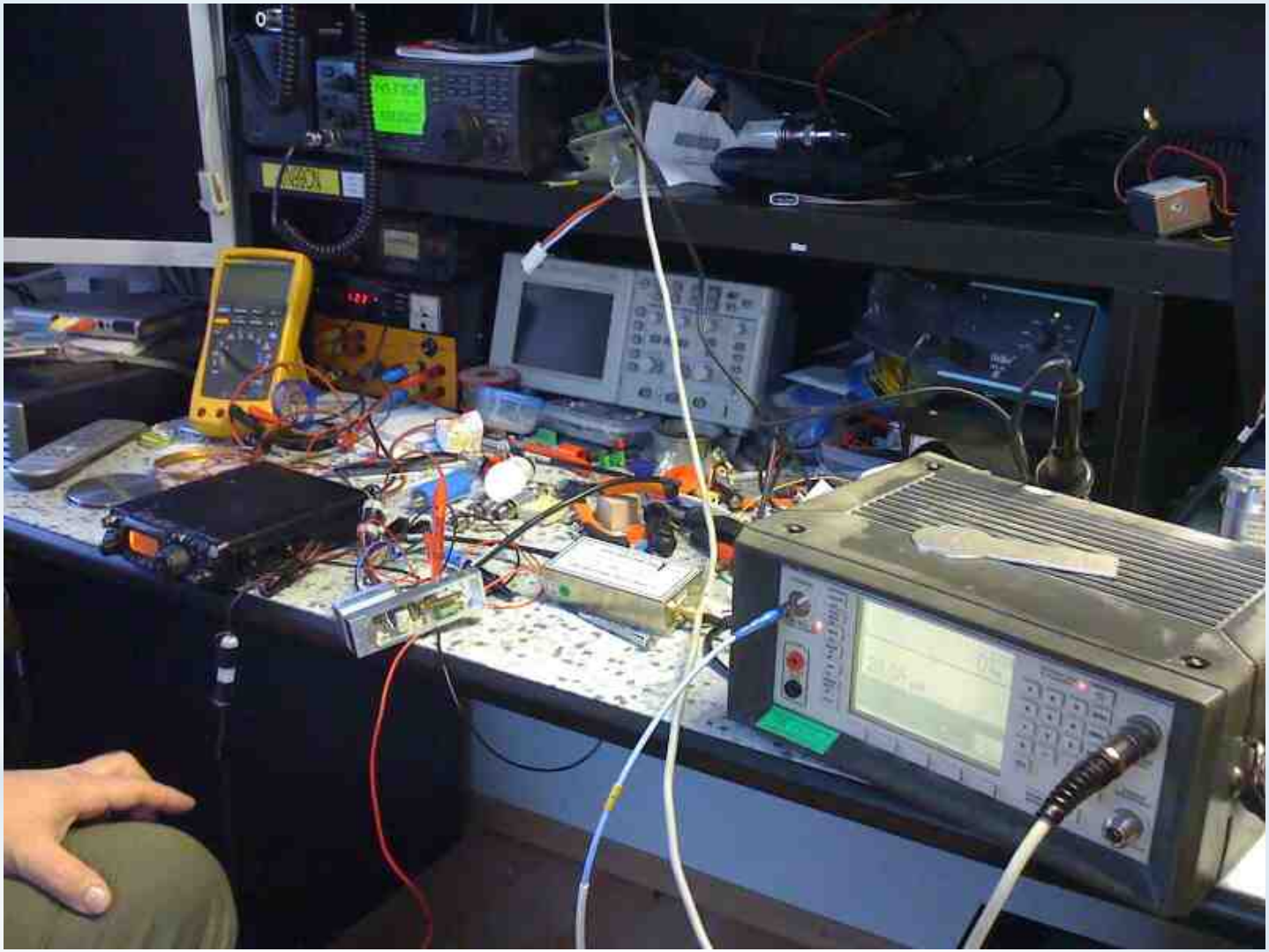


DL2AM

Jeden z průkopníků mikrovln v DL

Troška historie nikoho nezabije

Září 2008,
Tichá



Troška historie nikoho nezabije

Pavel, OK2VJC

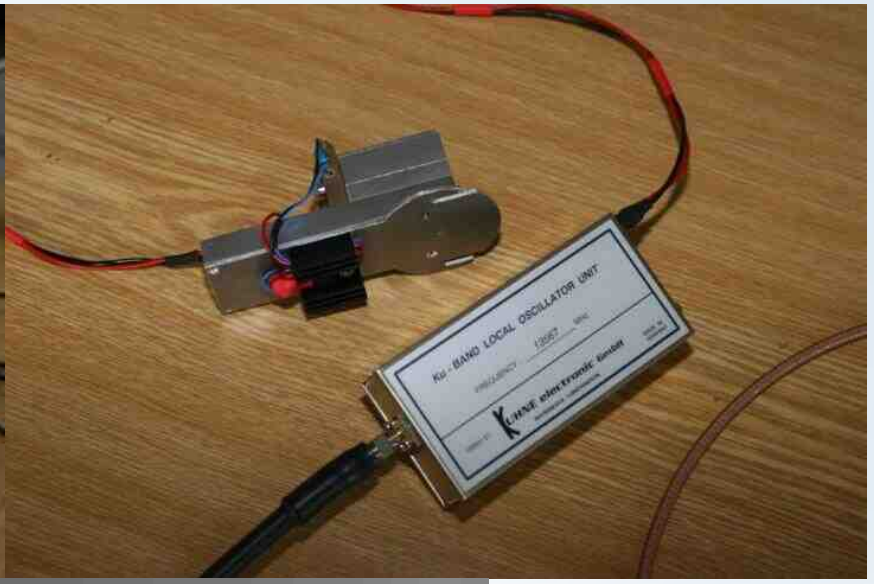
Oscilátor nahražen generátorem Marconi

Září 2008 první pokusy
v Tiché u Frenštátu p.R.

Troška historie nikoho nezabije

Září 2008 první pokusy
v Tiché u Frenštátu p.R.
QRB 700m

Troška historie nikoho nezabije



MWM Frenštát
Září 2008

Troška historie nikoho nezabije

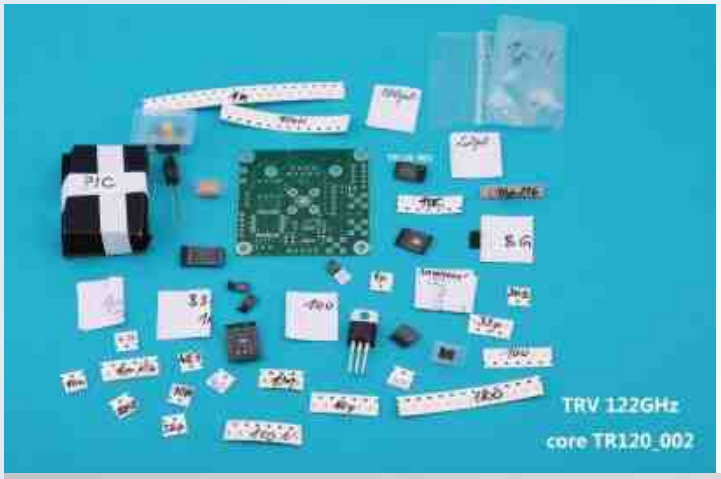
UHF Contest 2008

OK2BUC a OK2ULQ

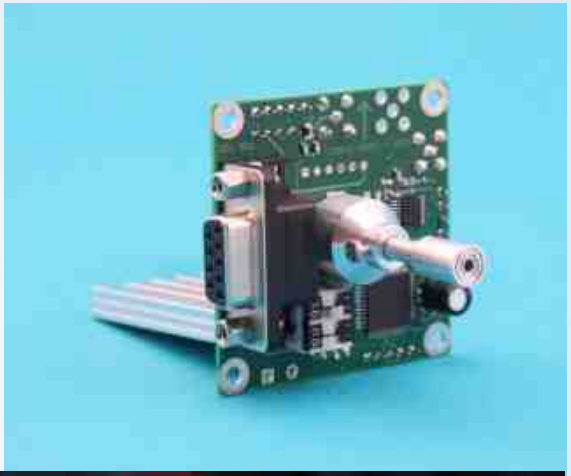
Troška historie nikoho nezabije

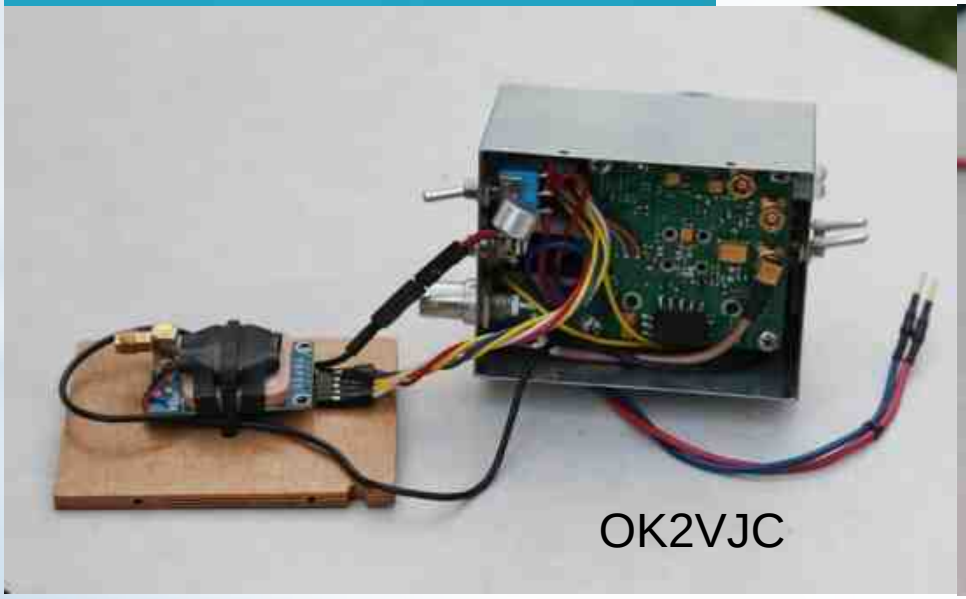
1. QSO OK – OM
   OK2VJC/p, OK2IMH
   Srpen 2009
   QRB 3km

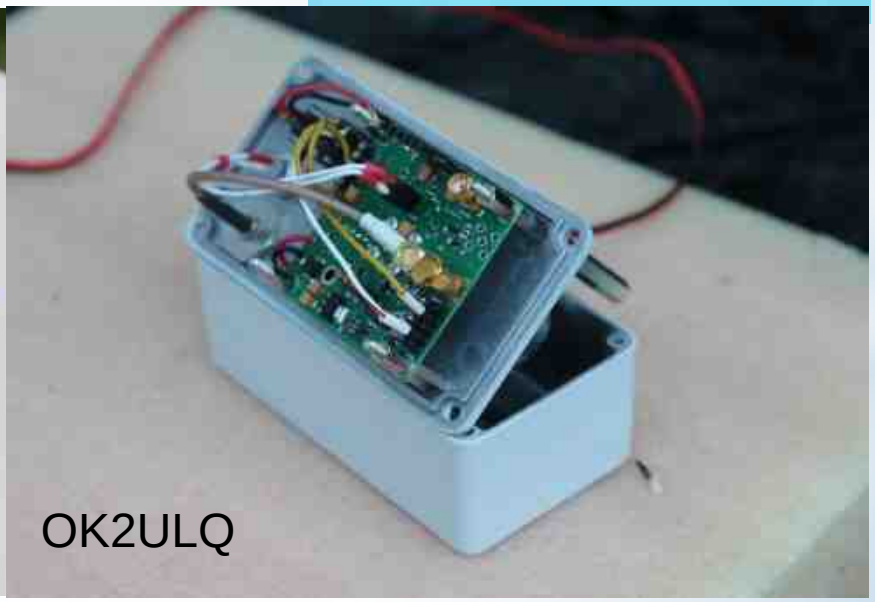
A potom přišel „Klokan 1“…



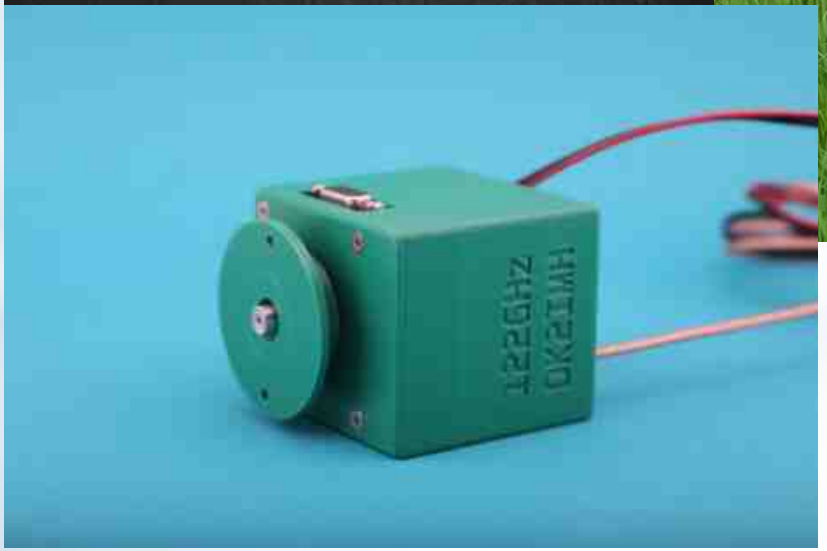
Konstrukce
VK3CV




OK2VJC

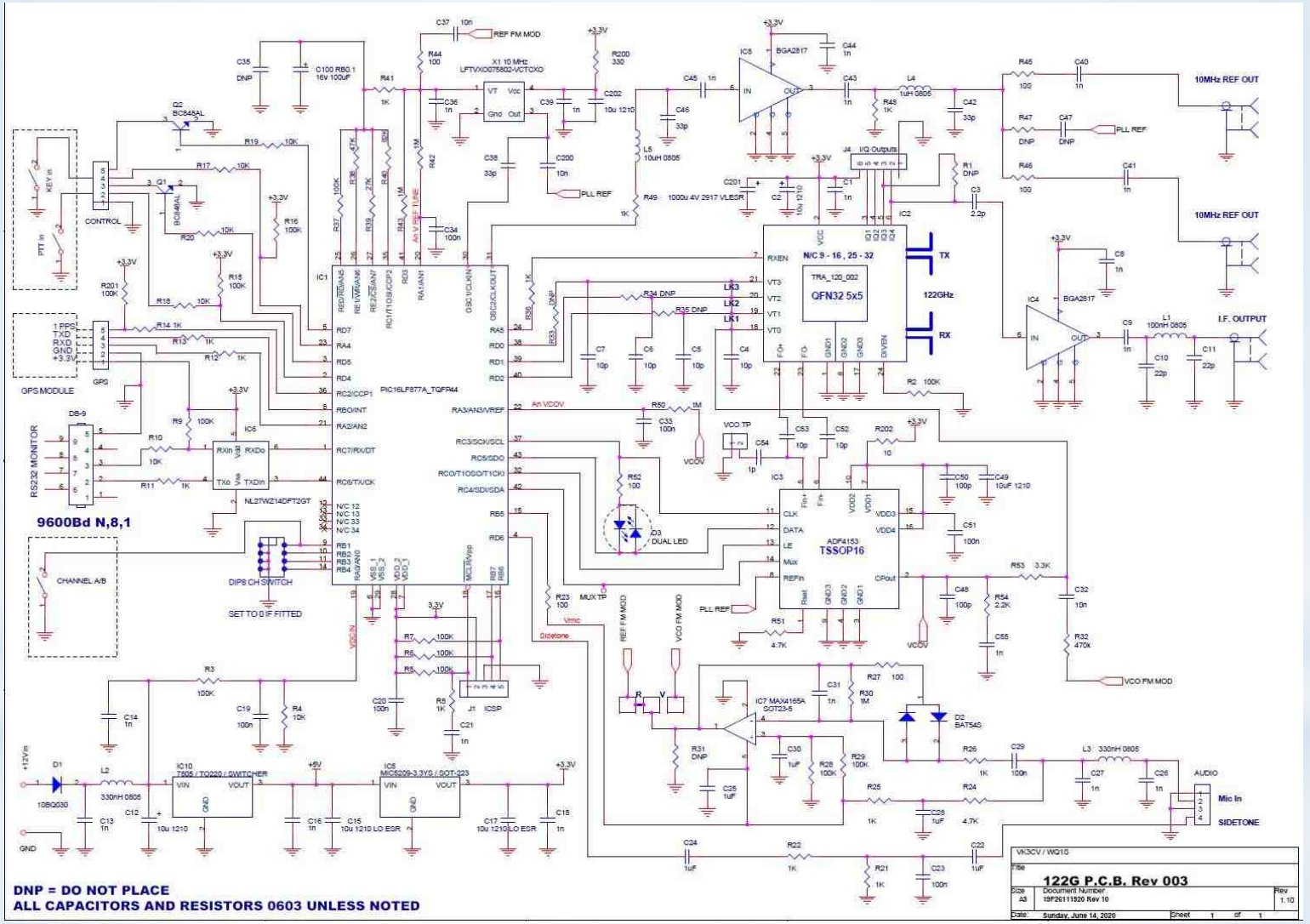

OK2ULQ

„Klokan 1“

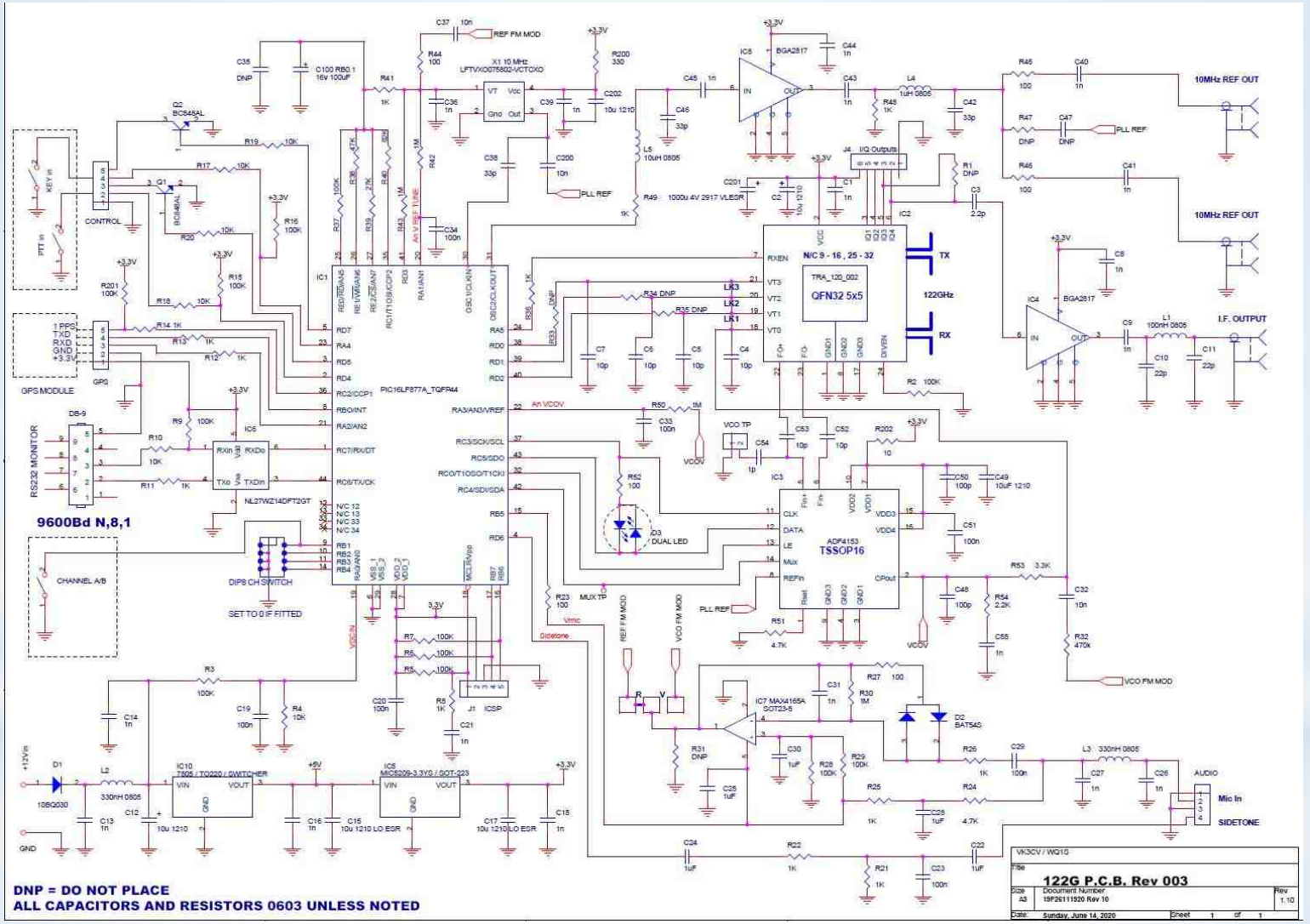


Různé verze transvertoru, zde OK2QW a OK2IMH

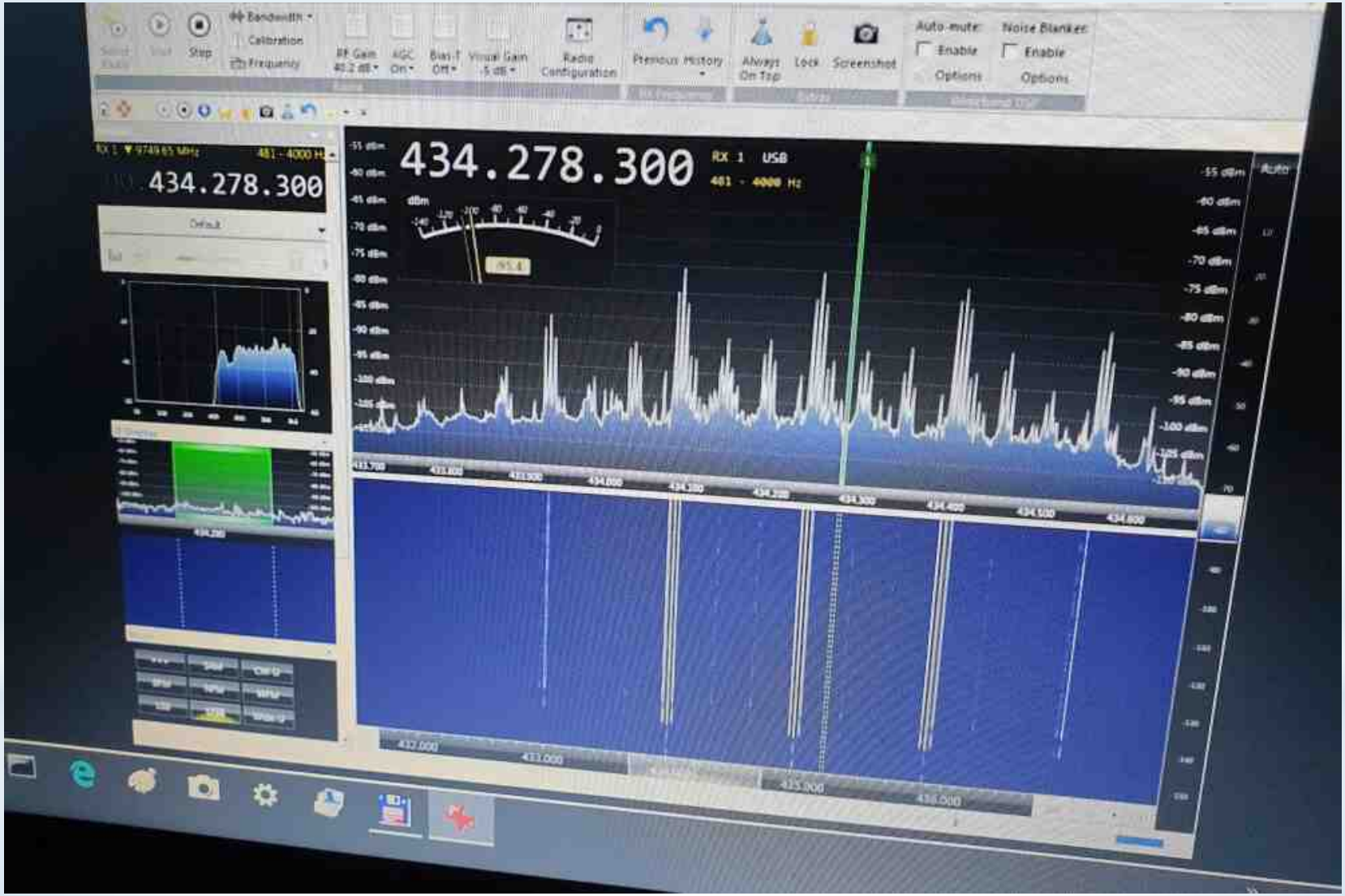
„Klokan 1“


9600Bd N,8,1
RS232 MONITOR
GPS MODULE
CHANNEL A/B
DIPS CH SWITCH
SET TO 0 IF FITTED
CONTROL
PIC16LF877A_TQFP44
QFN32 5x5
TRA_120_002
N/C 9 - 16 , 25 - 32
122GHz
TX
RX
ADF4153
TSSOP16
10MHz REF OUT
10MHz REF OUT
I.F. OUTPUT
PLL REF
VCO FM MOD
REF FM MOD
SIDETONE
Mic In
AUDIO
DUAL LED
122G P.C.B. Rev 003
DNP = DO NOT PLACE
ALL CAPACITORS AND RESISTORS 0603 UNLESS NOTED

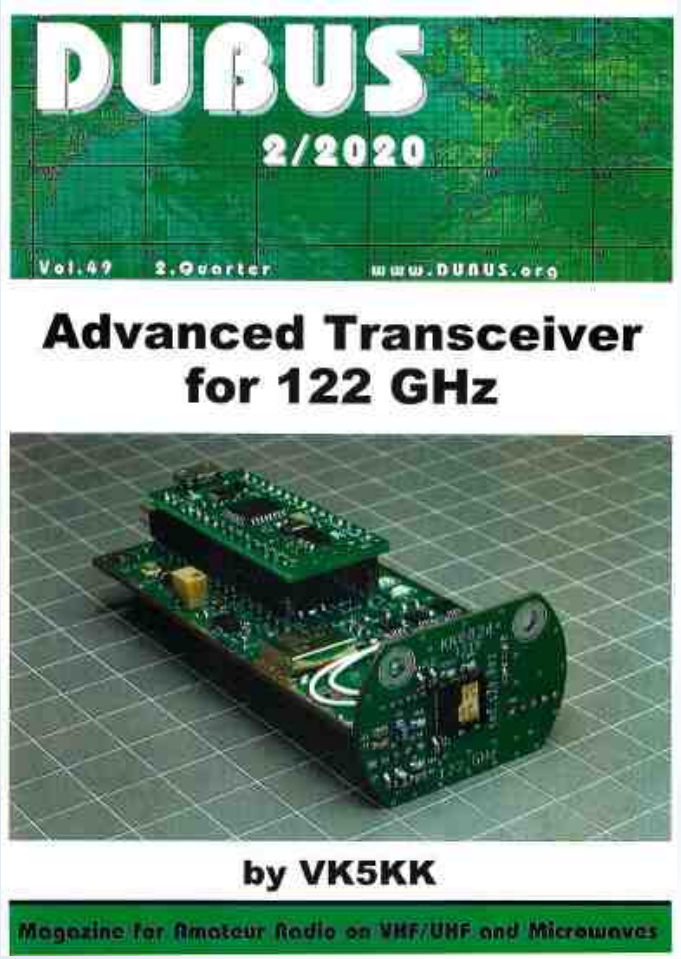
„Klokan 1“

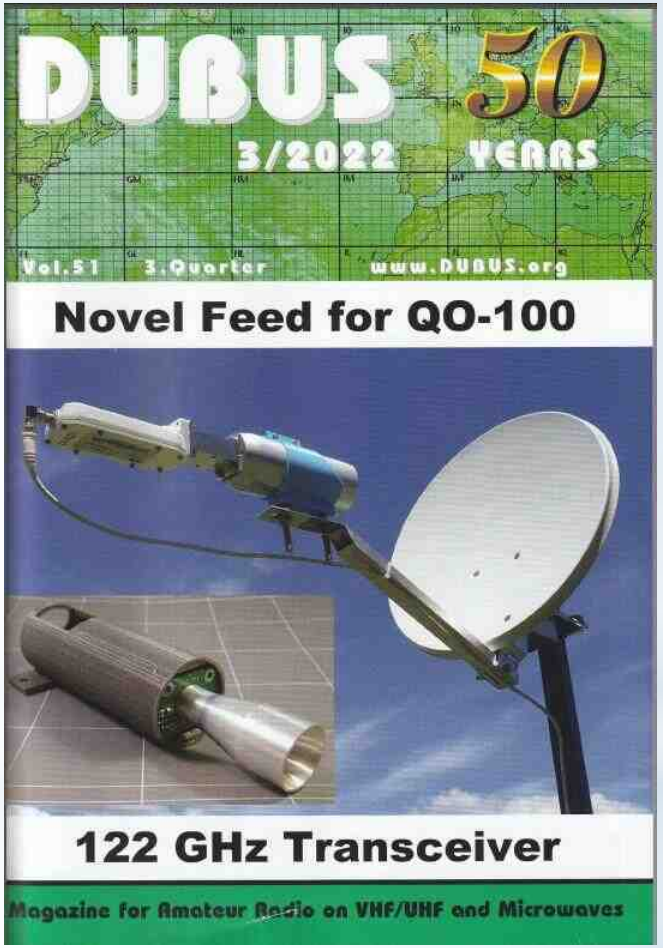

9600Bd N,8,1
DNP = DO NOT PLACE
ALL CAPACITORS AND RESISTORS 0603 UNLESS NOTED
122G P.C.B. Rev 003
10MHz REF OUT
I.F. OUTPUT
SIDETONE
QFN32 5x5
TSSOP16
PIC16LF877A_TQFP44

Spektrum nic moc…

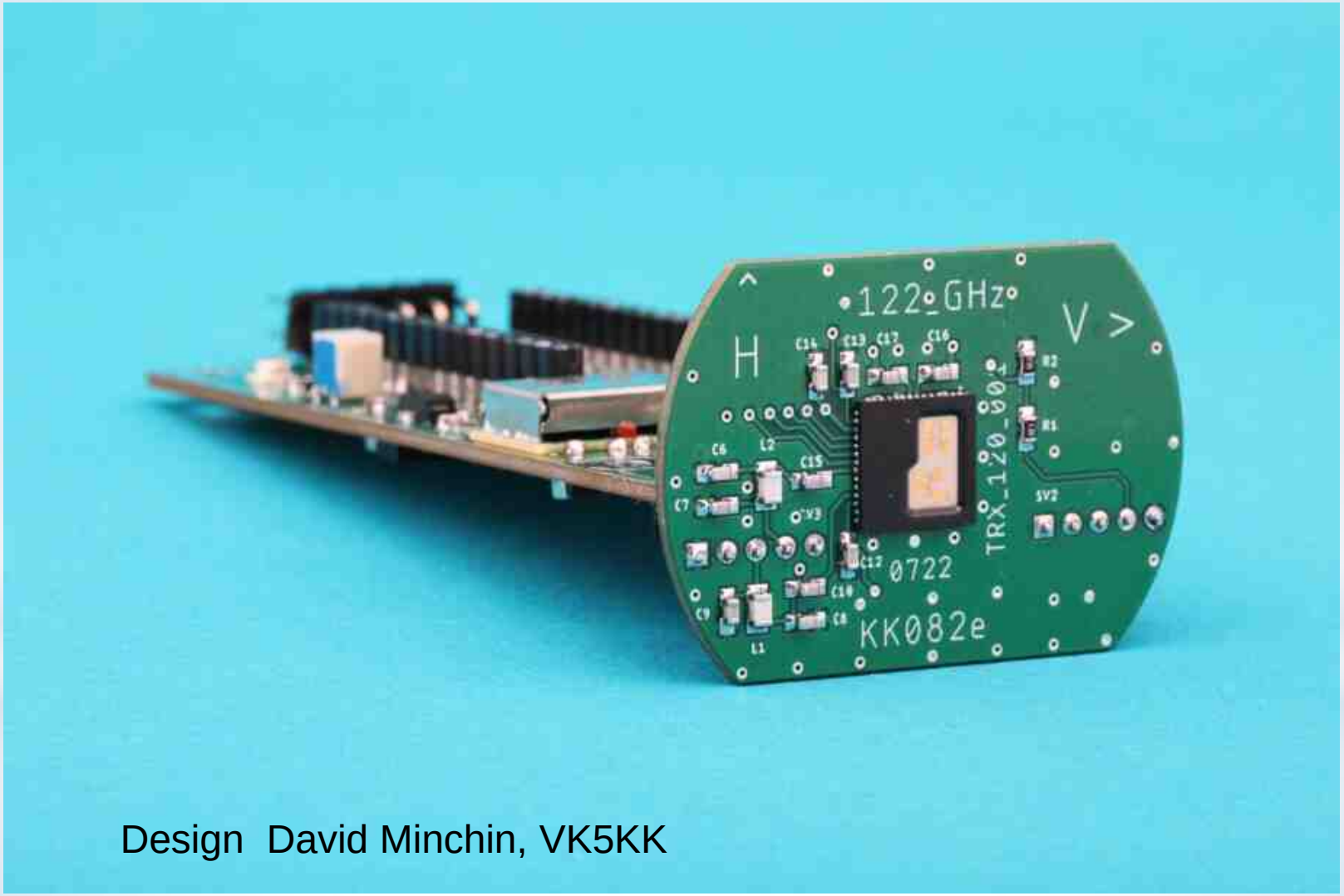


Nový tranvertor od VK5KK popsaný v DUBUSu





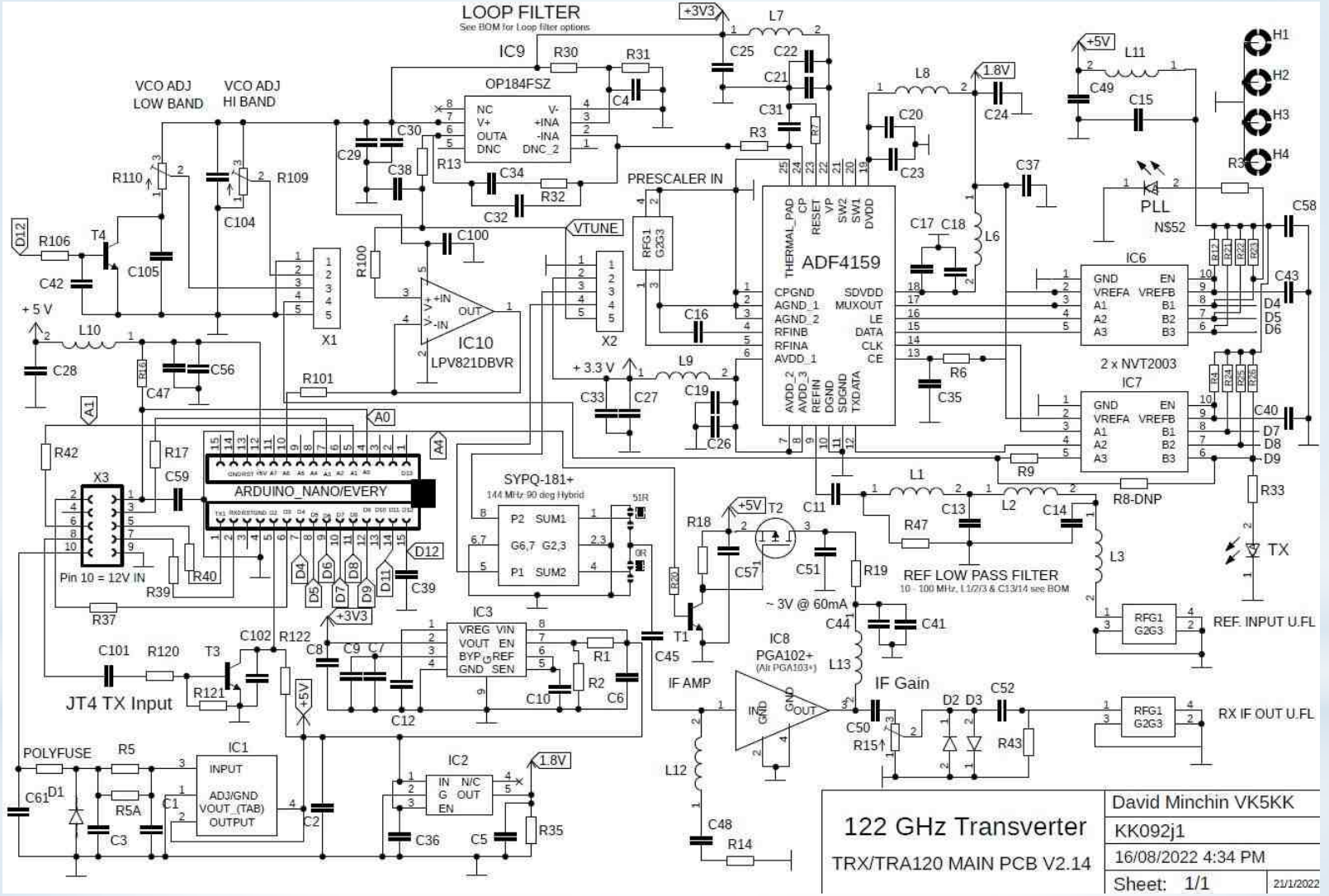
Tak tedy „Klokan 2“…



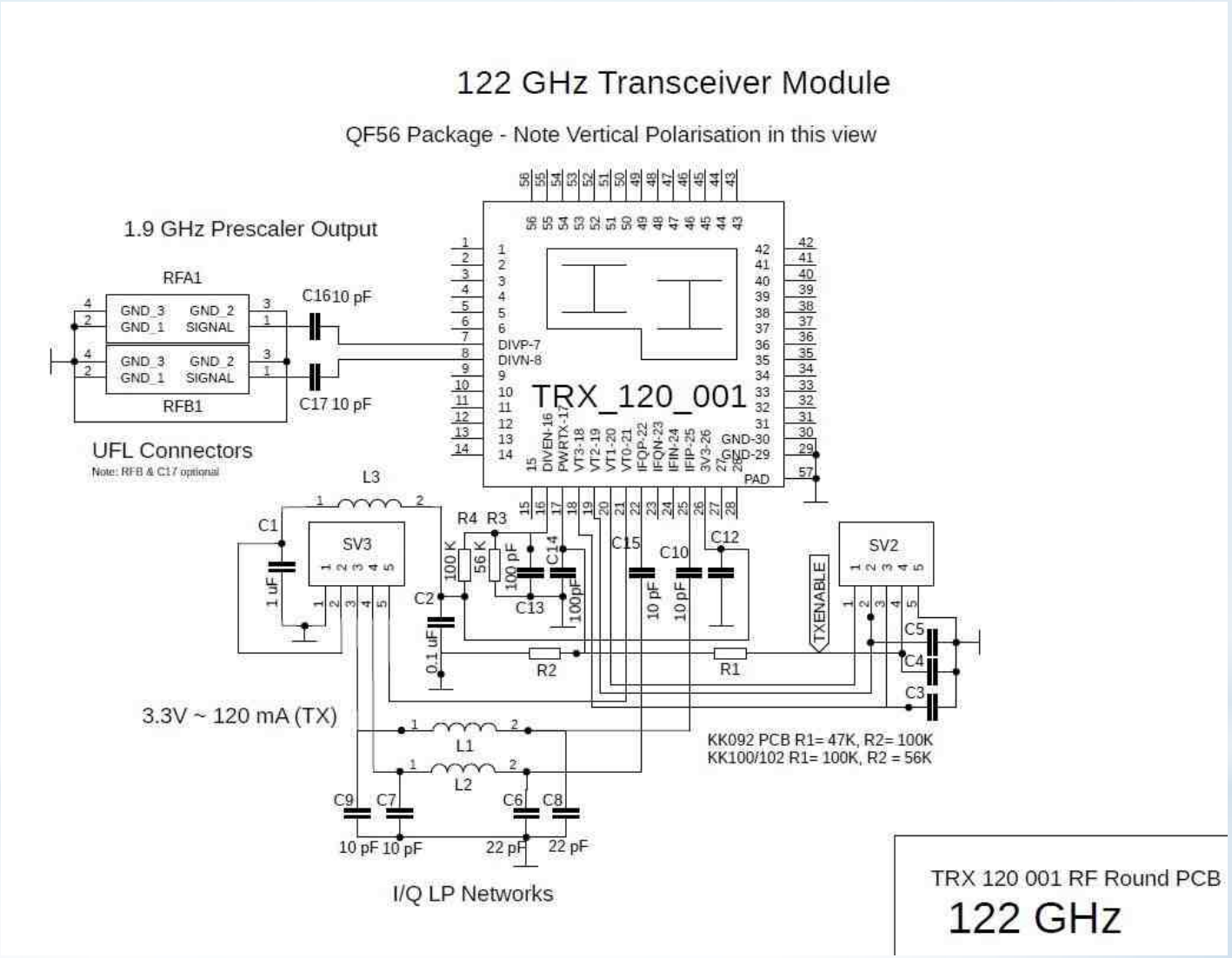
Design David Minchin, VK5KK

Setkání s autorem v srpnu 2022 v Praze

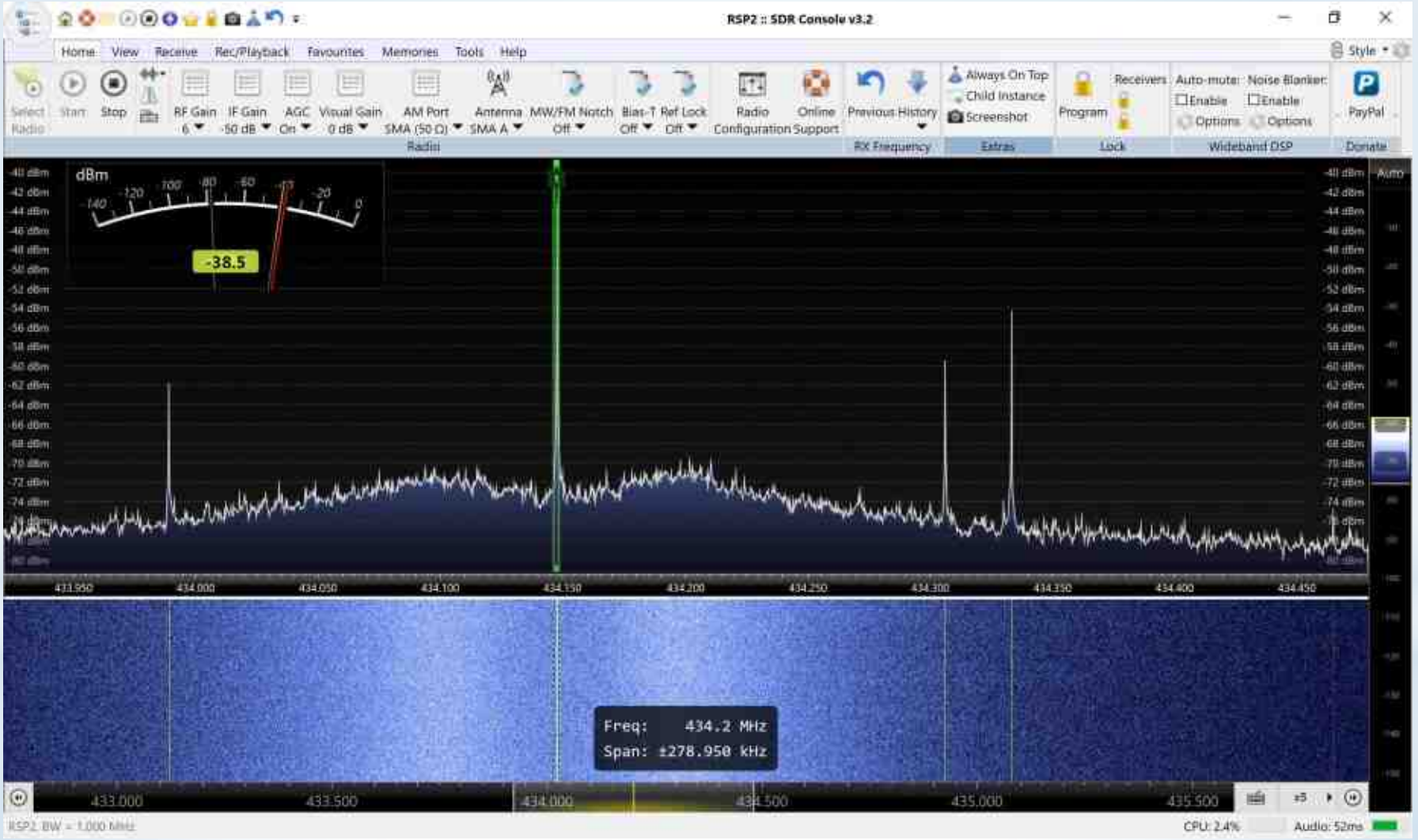
Klokan 2


LOOP FILTER
See BOM for Loop filter options
IC9
OP184FSZ
VCO ADJ LOW BAND
VCO ADJ HI BAND
PRESCALER IN
VTUNE
ADF4159
IC10
LPV821DBVR
IC6
IC7
2 x NVT2003
PLL
N$52
ARDUINO_NANO/EVERY
Pin 10 = 12V IN
SYPQ-181+
144 MHz 90 deg Hybrid
IC3
IC8
PGA102+
IF AMP
IF Gain
REF LOW PASS FILTER
~ 3V @ 60mA
JT4 TX Input
REF. INPUT U.FL
RX IF OUT U.FL
TX
IC1
IC2
POLYFUSE
122 GHz Transverter
TRX/TRA120 MAIN PCB V2.14
David Minchin VK5KK
KK092j1
16/08/2022 4:34 PM
Sheet: 1/1

Klokan 2


122 GHz Transceiver Module
QF56 Package - Note Vertical Polarisation in this view
1.9 GHz Prescaler Output
RFA1
GND_3
GND_2
GND_1
SIGNAL
RFB1
C16 10 pF
C17 10 pF
UFL Connectors
Note: RFB & C17 optional
TRX_120_001
DIVP-7
DIVN-8
DIVEN-16
PWRTX-17
VT3-18
VT2-19
VT1-20
VT0-21
IFQP-22
IFQN-23
IFIN-24
IFIP-25
3V3-26
GND-30
GND-29
PAD
L3
C1
1 uF
SV3
R4
R3
100 K
56 K
100 pF
C14
C13
100pF
C2
0.1 uF
C15
10 pF
C10
10 pF
C12
R2
R1
SV2
TXENABLE
C5
C4
C3
3.3V ~ 120 mA (TX)
L1
L2
C9
C7
C6
C8
10 pF
10 pF
22 pF
22 pF
I/Q LP Networks
KK092 PCB R1= 47K, R2= 100K
KK100/102 R1= 100K, R2 = 56K
TRX 120 001 RF Round PCB
122 GHz

Spektrum


RSP2 :: SDR Console v3.2
Home View Receive Rec/Playback Favourites Memories Tools Help
Style
Select Radio
Start
Stop
RF Gain 6
IF Gain -50 dB
AGC On
Visual Gain 0 dB
AM Port SMA (50 Ω)
Antenna SMA A
MW/FM Notch Off
Bias-T Off
Ref Lock Off
Radio Configuration
Online Support
Previous
History
Always On Top
Child Instance
Screenshot
Program
Receivers
Auto-mute: Enable Options
Noise Blanker: Enable Options
PayPal
Radio
RX Frequency
Extras
Lock
Wideband DSP
Donate
dBm
-38.5
Auto
Freq: 434.2 MHz
Span: ±278.950 kHz
433.000
433.500
434.000
434.500
435.000
435.500
RSP2 BW = 1.000 MHz
CPU: 2.4%
Audio: 52ms

Důvody čistšího spektra

- použití nízkošumových součástek (i za cenu QFN pouzder)

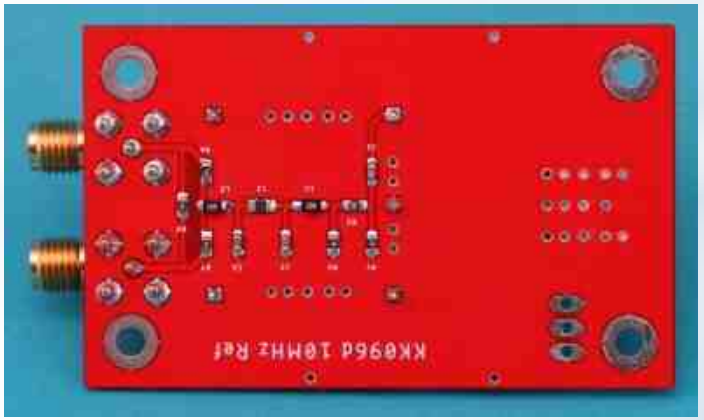
- důsledná filtrace napájecích napětí v přívodu k PLL, TRX120 atd.

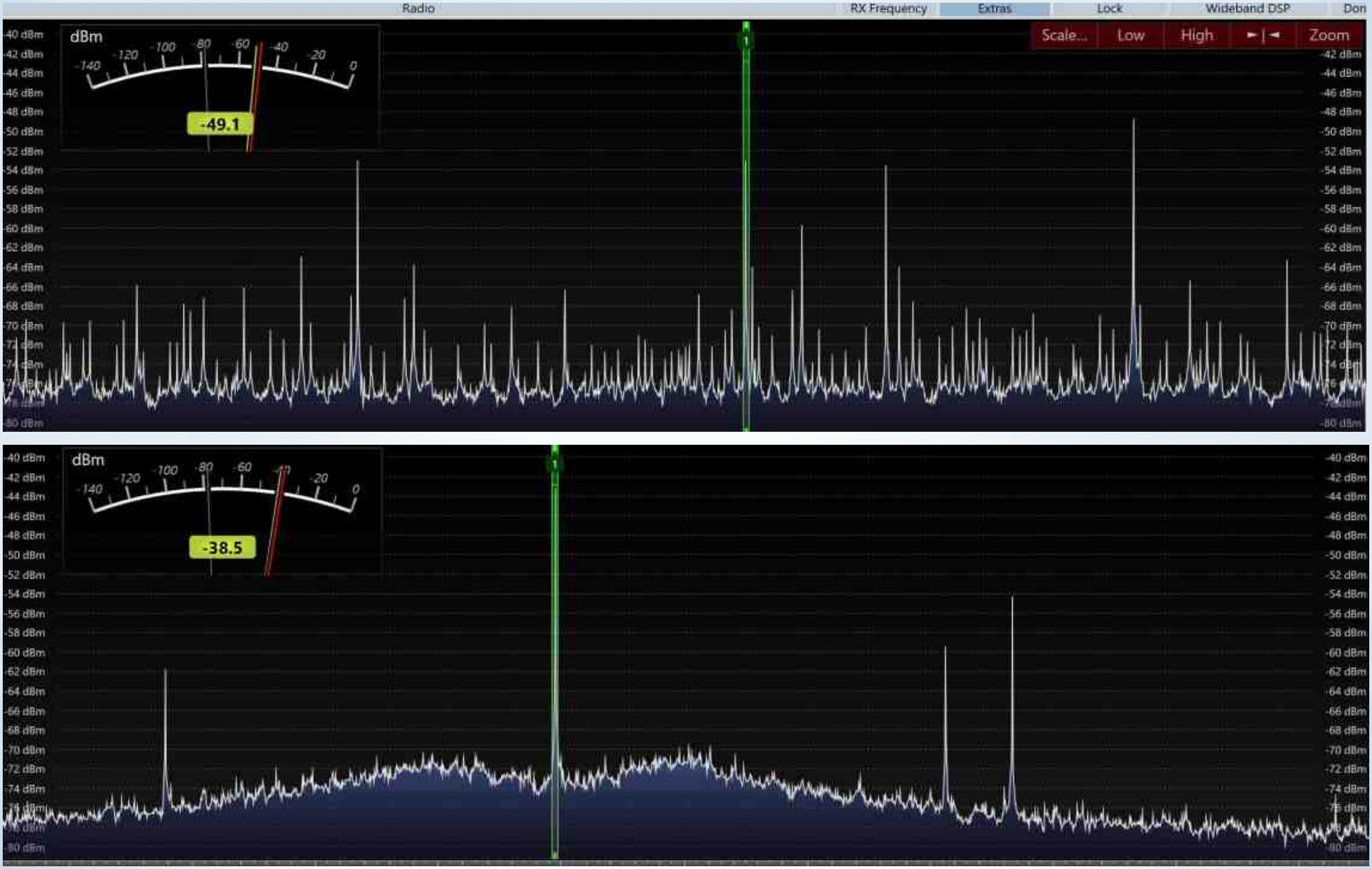
- jsou použity speciální stabilizátory napětí, LDO, low noise, high PSRR

  - ADP150AUJZ-1.8-R7

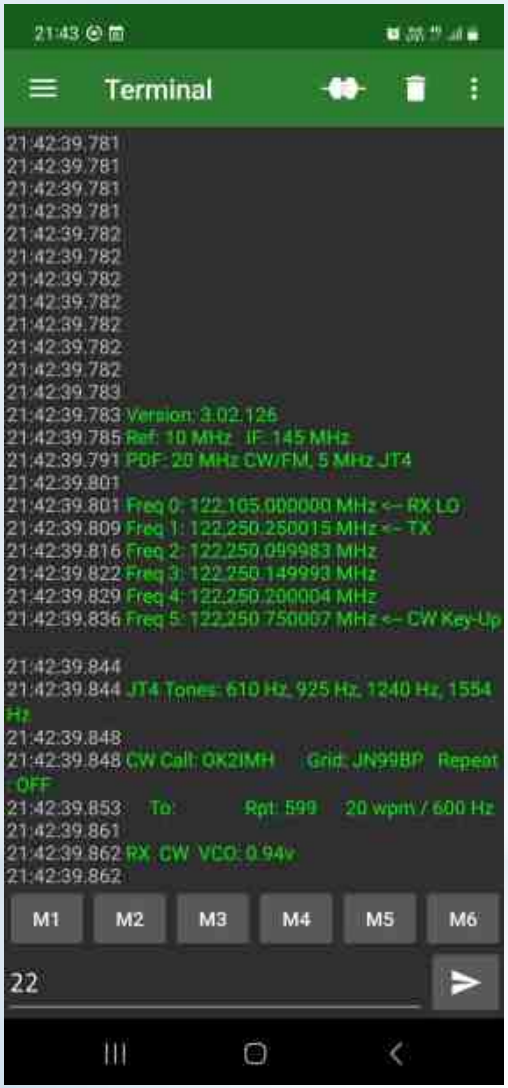
  - ADM7154ACPZ-3.3-R7

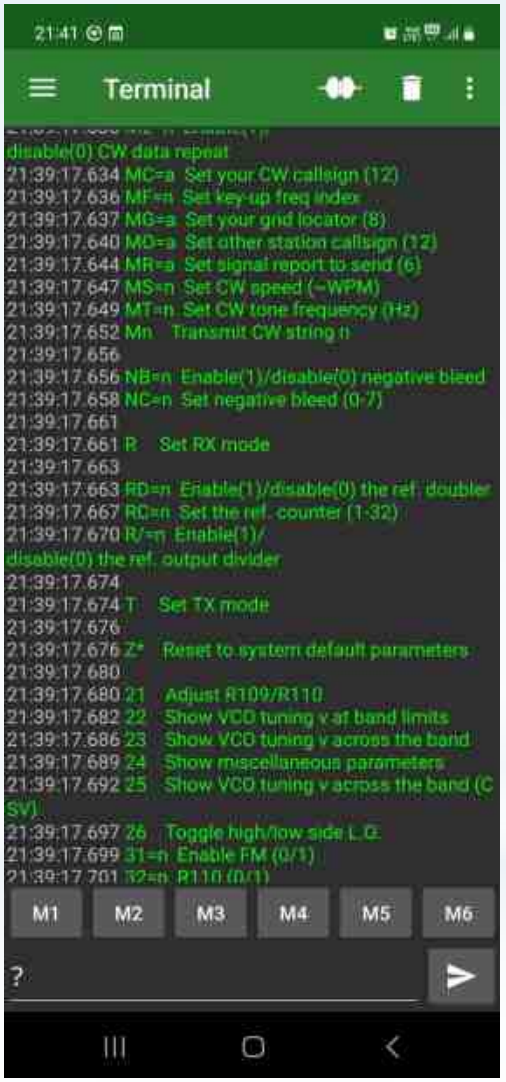
- použití externího, krystalového TCXO (Bodnar ne)

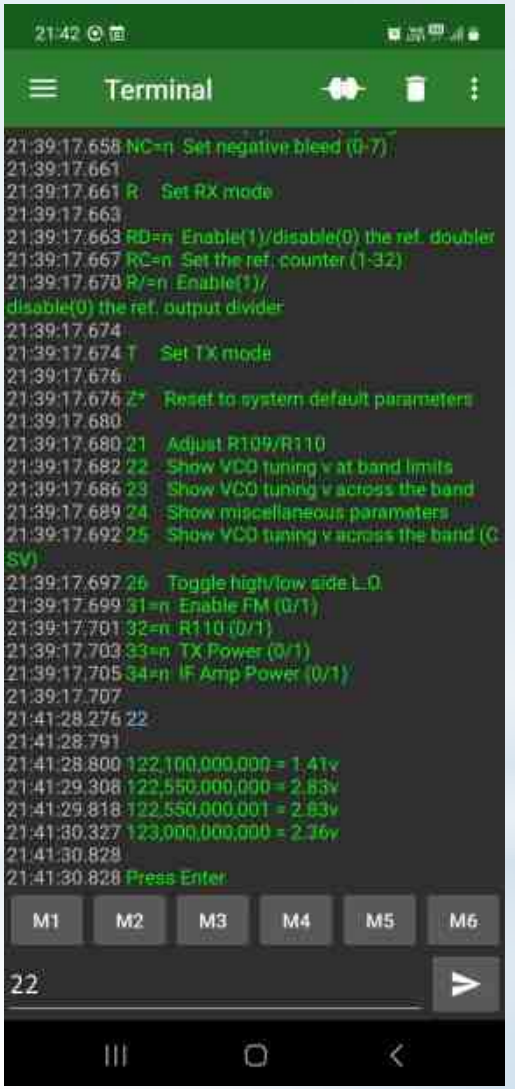



Radio
RX Frequency
Extras
Lock
Wideband DSP
Don
dBm
-140
-120
-100
-80
-60
-40
-20
0
-49.1
Scale...
Low
High
Zoom
-38.5

Ovládání transvertoru



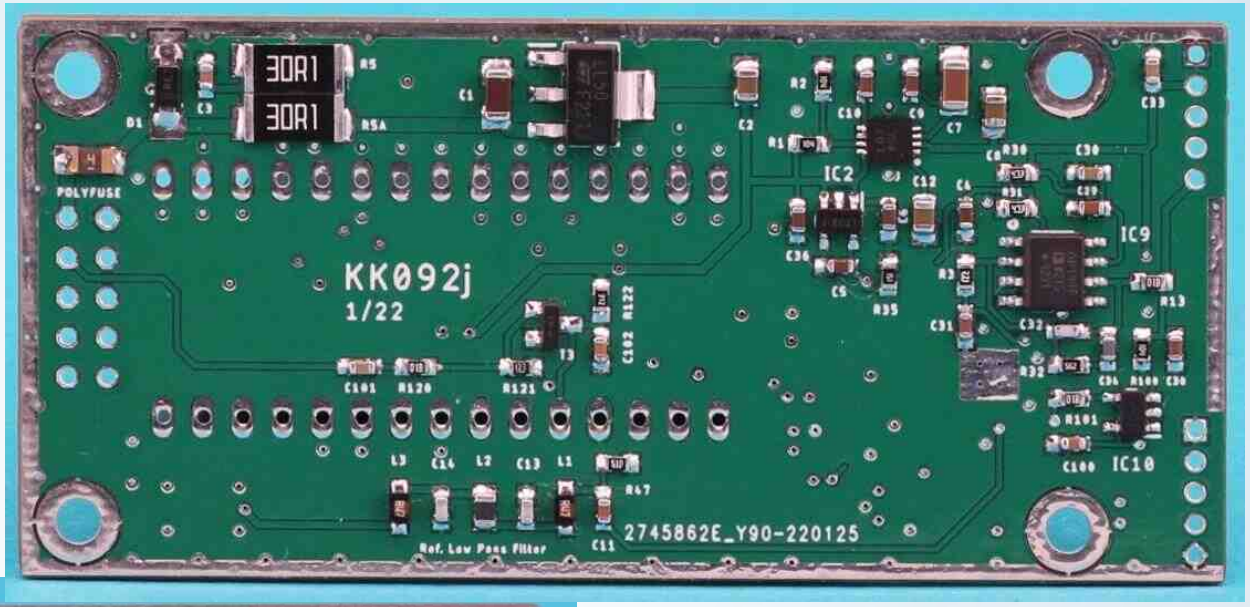




Uchycení transvertoru v parabole

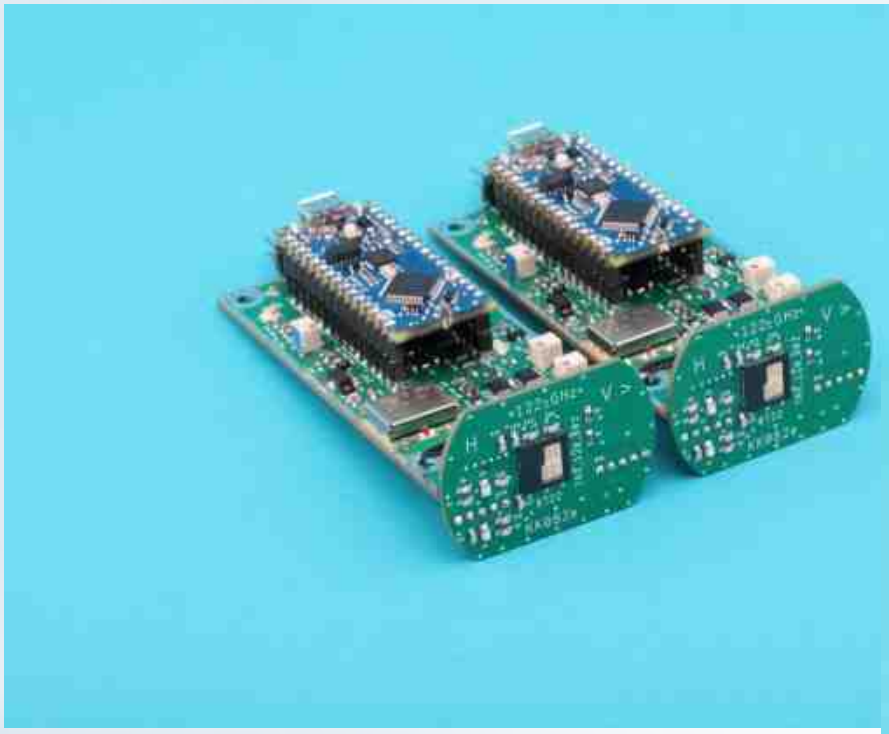
QSO OK2IMH - OK2C v 1. subr. 2023

Klokan 2

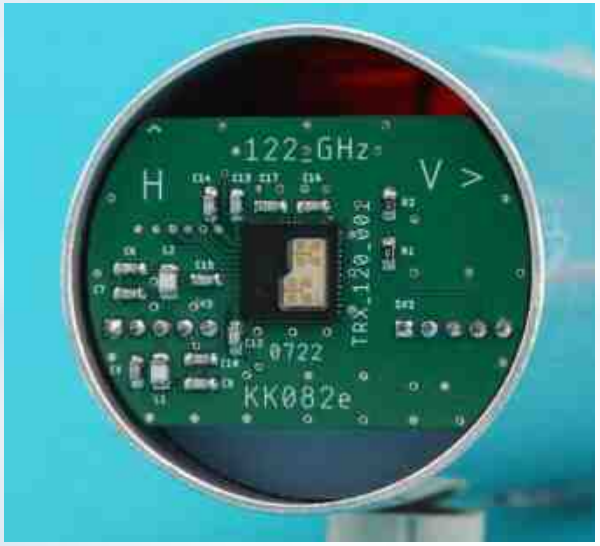

KK092j
1/22
2745862E_Y90-220125


KK092j
V2.14 1/22
IF
X3
PLL
REF
TR_120 Main PCB

Klokan 2



Klokan 2



Oscilátor + předregulátor 8V

SDR přijímač

Marketing musí být, hi

Marketing musí být, hi

Děkujeme za pozornost!

Po skončení hlavní části přednášek budeme testovat v reálném provozu
122GHz zařízení „klokan 2“