



STEP	VFO	SPAN	RIT	B:7010000	OFF
10kHz	A	10kHz	OFF	A:21074000	

vu2lch | HK97fj 2022/06/29 18:41:42

Recording stopped
sBITX v0.01 is Ready

Welcome vu2lch your grid is HK97fj
To change your call sign, or grid
enter \callsign [your/callsign]
or \grid [your/grid]
(without the brackets, starting with \)
For help enter \help

1 S E 184110 20 *1.20 2834 - IK3PQH YB7MM -13
184115 20 *1.20 2834 - ZP4KPK 4X1UP HK72
184115 17 *1.20 2875 - F8550 H8NKB NJ07
184130 17 *1.20 2834 - 9J2ND JH2UC PM94

Log:

10 H	12 H	MODE	LOW	HIGH	AGC	IF	AUDIO
		FT8	0	2750	OFF	67	65
15 H	17 H	20 H	KIC	COMP	WPH	PITCH	SPLIT
			25	0	13	1000	OFF
30 H	40 H	60 H	WATTS	TX	RX	REC	CLOSE
			20			OFF	

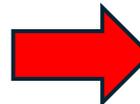
q	w	e	r	()	y	-	u	+	o	p			
a	4	s	d	o	f	/	g	h	j	k	l	DEL		
Alt	7	z	8	x	9	c	v	!	b	'	n	'	m	Enter
\cmd	0	SPACE	.	?	?	Macro								

sBitX V3

The Open Source Hybrid Transceiver.

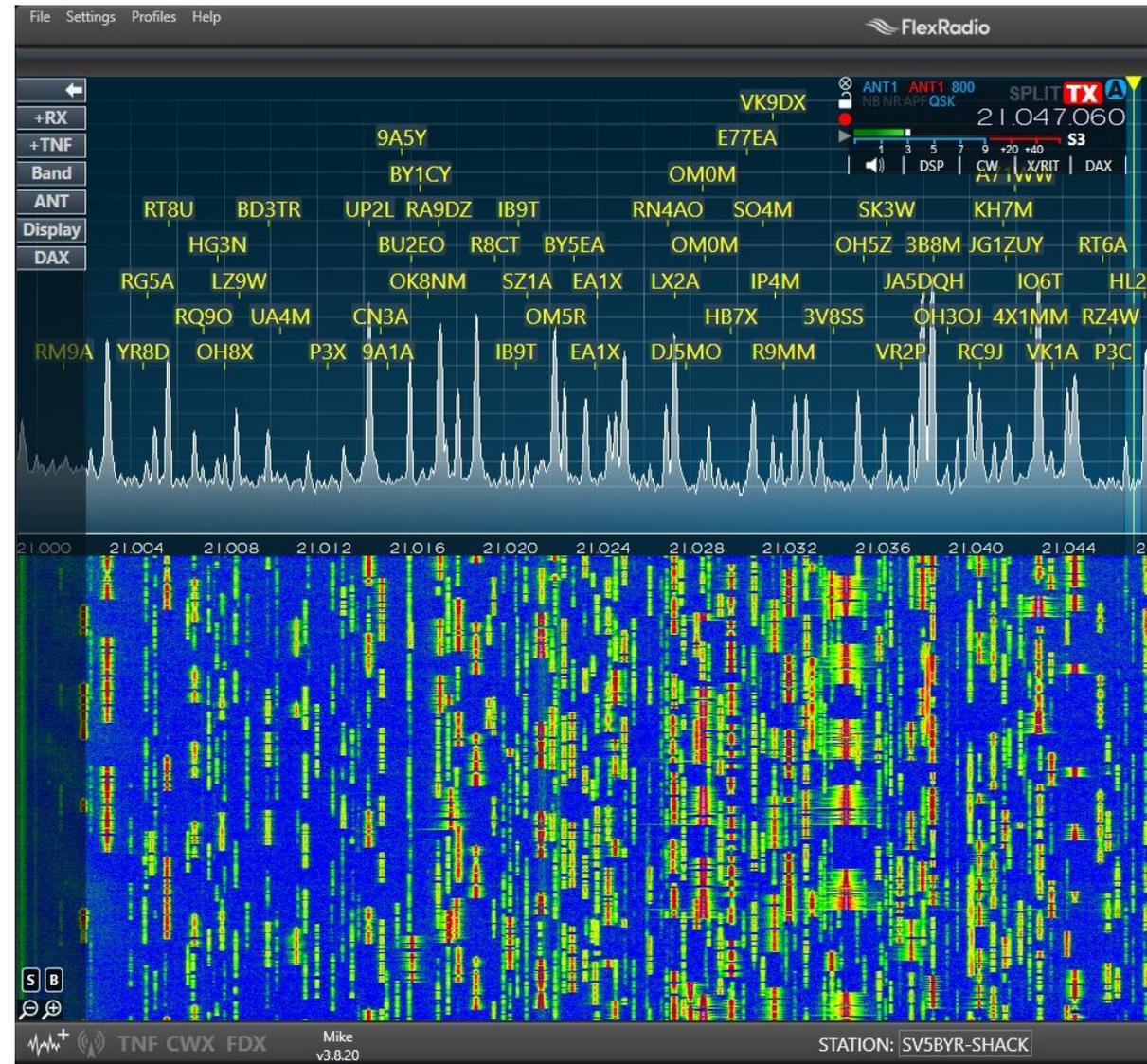
I wanted a POTA portable transceiver

- Budget friendly.
- Power and quality.
- Sensitive Receiver with filtering.

 **Waterfall and Spectrum Display.**

- Digital modes.
- CAT Control.
- Lightweight.
- Easy to customize.

....but I really wanted a FlexRadio....



Shopping for Waterfall



\$1999 - ICOM 705 (2.5 Pounds)
Lightweight, high quality



FT-DX10 \$1999 CAD (10 pounds!)
Heavyweight, high quality

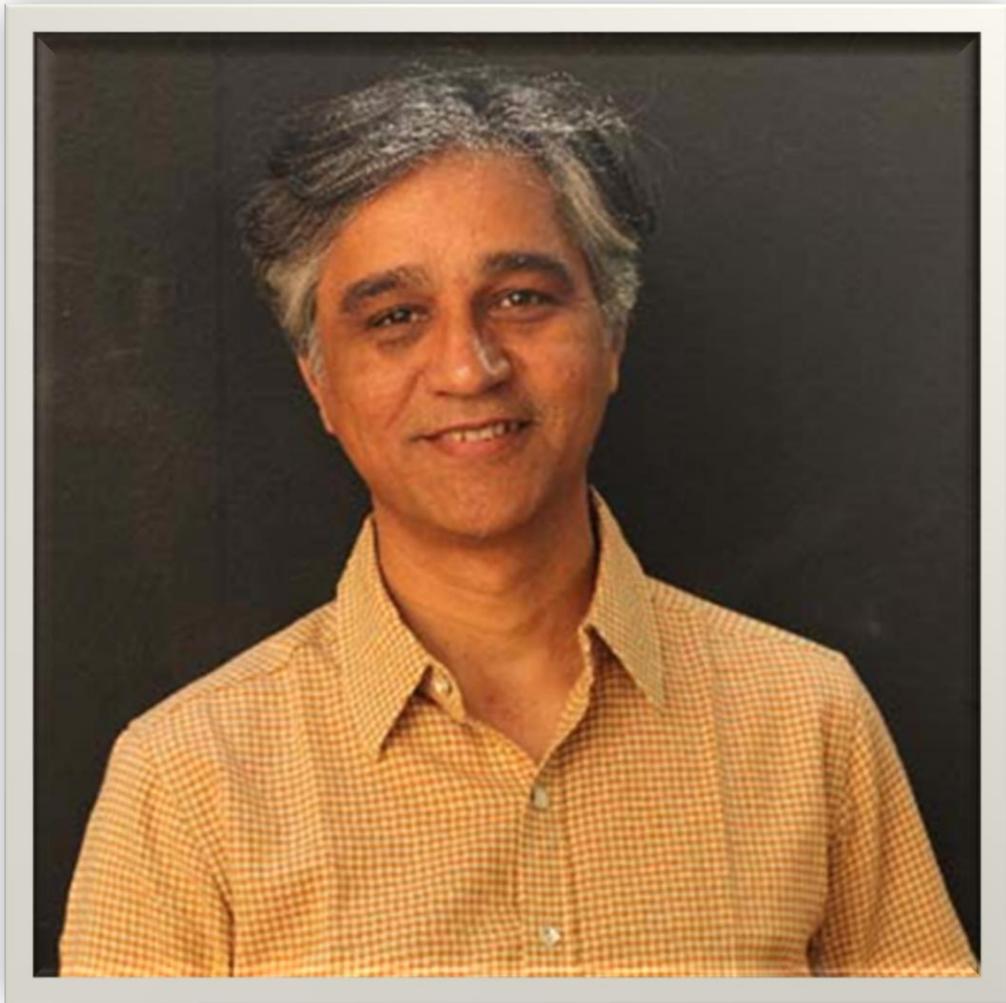


Xiegu X 6200 - \$1900 CAD - (2 Pounds)
Built like a brick, good tuner.



Xiegu G90 + CE19 \$650 (5 Pounds)
Solid SDR radio, but 2" screen.

Laptop,
+ tablet for
FT8



Designed by Ashar Farhan – **VU2ESE**

“Homebrew Hero”

Low cost, high performance radio designer!!

- Lamakaan Amateur Radio Club
- CQ Magazine Amateur Radio Hall of Fame
- Board Member of ARDC
- Designer of Bitx, uBitx and sBitX



BAND: 80m-10m (receive 100khz – 30 Mhz)

MODES: USB, LSB, CW, CWB, AM, FT8, DIGI (NFM soon)

Apps: JS8, RTTY, PSK31, DStar, DRM, Echolink, QSSTV, Telnet...

POWER: 40 watts.

VFO: Band stacking with Split, RIT

FILTERS: ANR, Notch, Parametric EQ, DSP, Hi/Lo cut

DISPLAY: Waterfall, spectrum, VSWR, PWR, S-Meter

NETWORK: Web Remote, CAT control, baseband audio.

LOGGING: Built-in Logger



What would that be worth?

sBitX v3 Assembled

• \$429 USD = \$608 CAD

Includes:

- Case
- Raspberry Pi 4Gb
- Display
- Preloaded software
- Internal Microphone (not bad)
- External Microphone (terrible)



sBitx v3

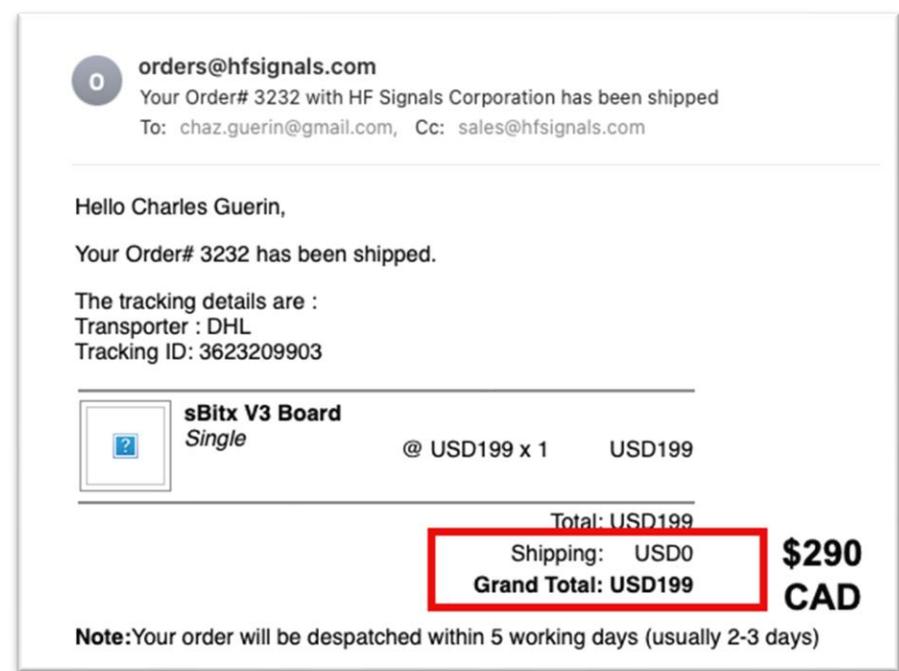
Just the boards.



Delivery Time: 4 days from India

Assembly Time: ~ 30 minutes to on the air

- ✓ Budget friendly.
- ✓ Power and quality.
- ✓ Sensitive Receiver with filtering.
- ✓ Waterfall and Spectrum Display.
- ✓ Digital modes.
- ✓ CAT Control.
- ✓ Lightweight.
- ✓ Easy to customize.



+ Raspberry Pi 4 8Gb - **\$129**

+ Pi Screen **\$115**

+ Microphone: **\$40**

+ 3D Printed Case (\$5)

Outlay: \$569 CAD

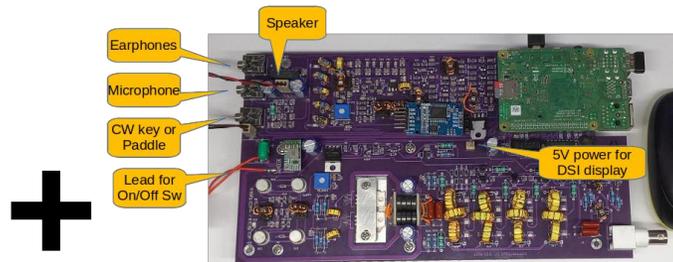
sBitx v3

“Hot Glue Gun POTA” solution



\$9.99

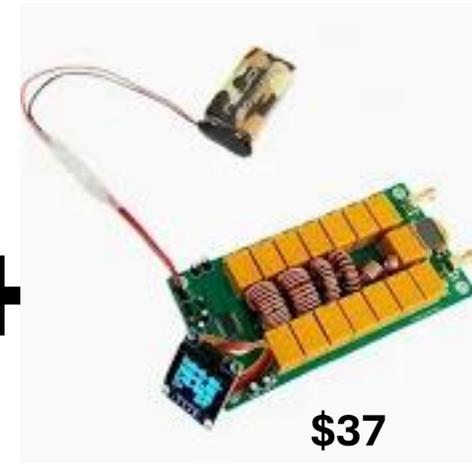
Princess Auto



\$290



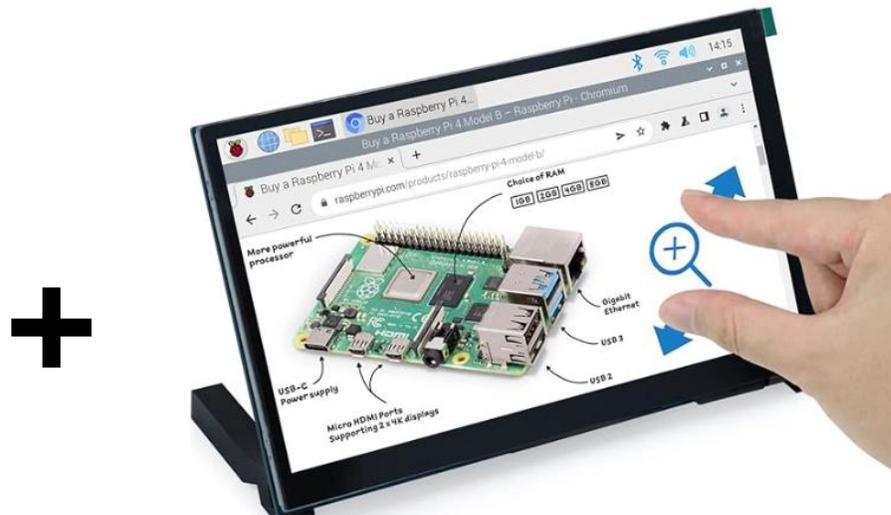
\$100



\$37



\$50



\$59



\$25

\$572 – Cheaper than Xeigu G90!

The “Kitchen Sink” – sBitX 64 (DREXJJ)

Full featured transceiver, advanced filtering, more-or-less idiot-proof.



[Reference](#)



Included Apps

Voice:

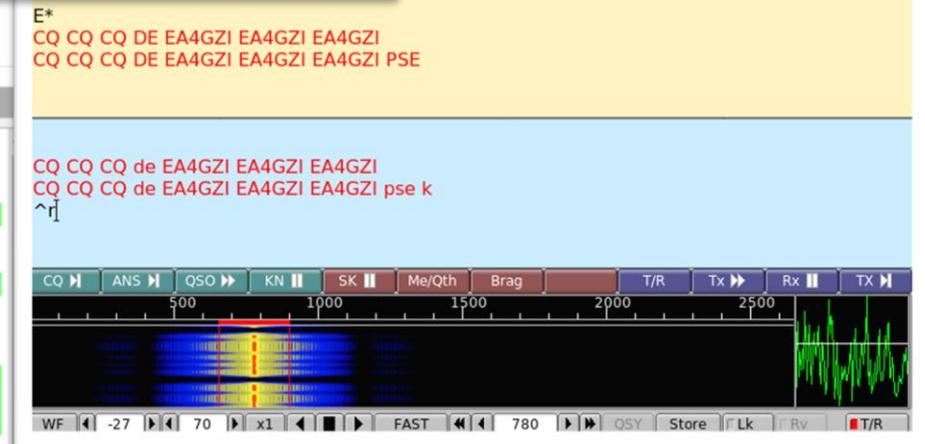
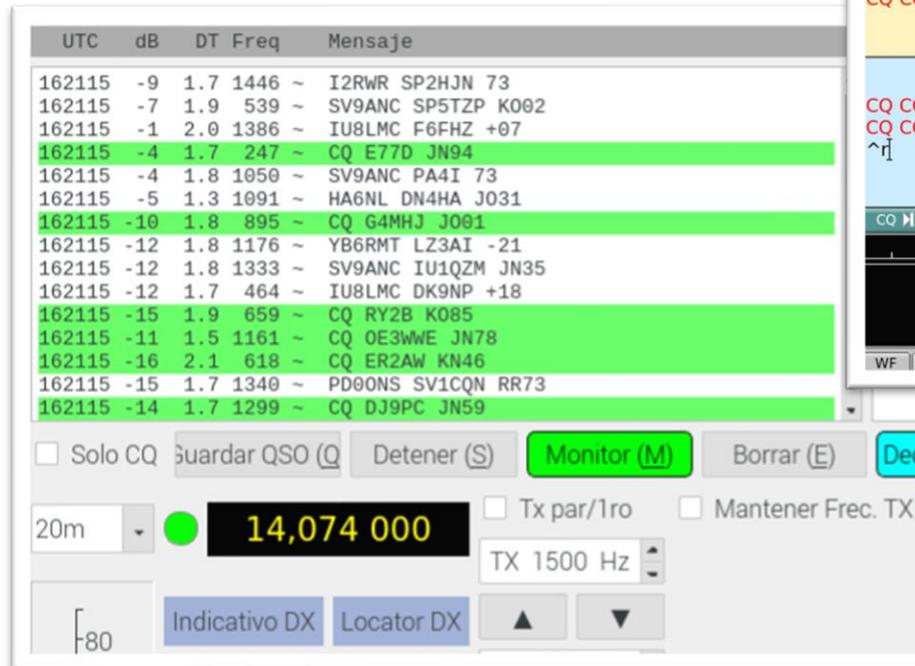
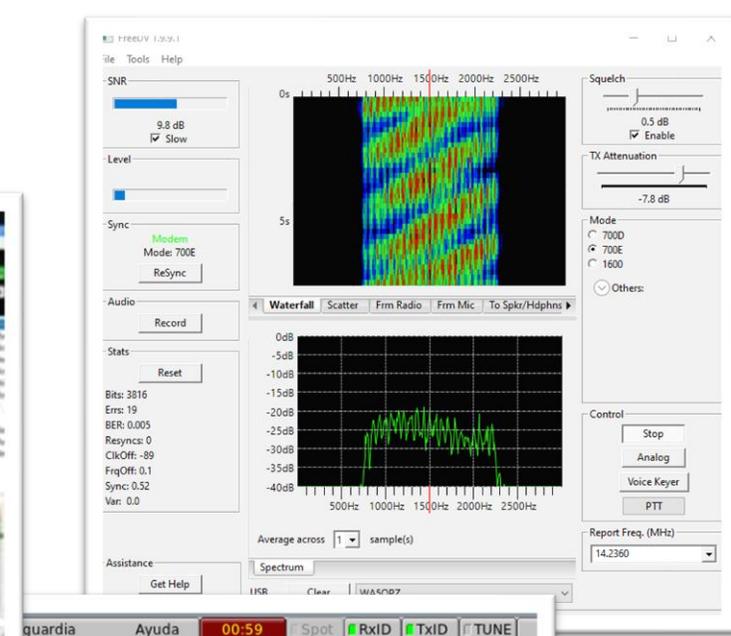
- FreeDV PTT v2.45 by [W2JON](#)
- USB Headset app

Packet Radio / RTTY / FTTY

- DireWolf
- FLDigi v4.1.23-1
- GridTracker2
- WSJTX-Improved v2.6.1
- JTDX v2.2.159
- JS8Call v2.2.1
- PAT Winlink v0.16.0
- ARDOP
- QTtermTCP
- QTSoundModem
- KISS-TNC
- QSSTV-W4WHL Edition

Miscellaneous

- CQRLog v2.5.3
- Scanner App
- Macro Editor
- Log Export Utilities
- PSKReporter
- XDX v2.91-2

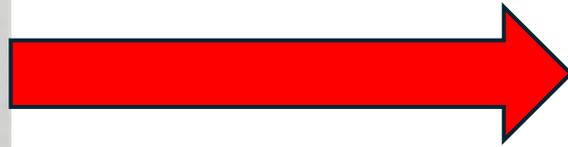


Open-Source GUI

Don't like the interface? Change it!



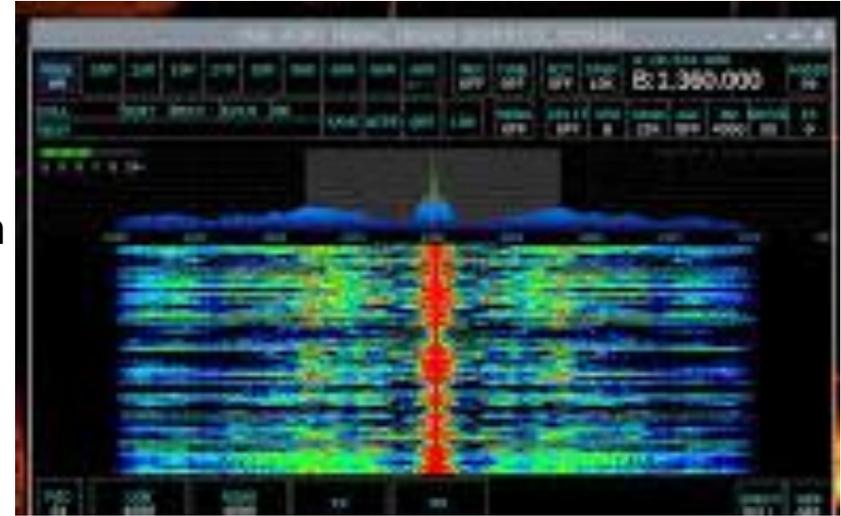
Early web version



All source code is included!

3D Buttons
Web version
Frank Durante KE2AMY

Full screen
waterfall on
Pi Zero
W9JES

A modern GUI interface on a Pi Zero. The interface is clean and organized, featuring a large circular progress indicator, a frequency display, and various control buttons. The text 'Modern GUI interface on Pi Zero' is written below the image.

A 18.100.000
B 18.100.000

MODE FT8 AGC FAST BW 4000 BAND
SPAN 25K IF 86 PWR 71 SPKR 2
FT8 AUTO FT8 TX1ST FT8 TONE 1580 FT8 RETRY 3

CALL SENT EXCH OK WIPE SAVE QRZ Lookup
RCV NR NR

TX VOL 0 TEXT\CMD MACRO FT8 ESC F1 CQ F2 Call F3 Reply F4 RReply F5 73 F6 Call F7 RRR F8 RR73 F9 Zone? F10 About

CQ Calls

175430	20	-15	1312	CQ	AE0DC	EM49
175430	17	-14	2231	CQ	IW3BYL	JN56
175445	24	-12	1180	CQ	KB8SSH	EN80
175500	22	-14	1312	CQ	AE0DC	EM49
175500	18	-05	1472	CQ	KD9YLL	EM49
175530	29	-09	1547	CQ	TM79JO	
175530	15	-16	1900	CQ	IK3ORE	JN55
175600	31	-04	1547	CQ	TM79JO	
175600	20	-15	1900	CQ	IK3ORE	JN55
175700	28	-13	1294	CQ	GD6ICR	IO74
175700	18	-06	1469	CQ	KD9YLL	EM49
175700	13	-14	1997	CQ	OP4K	JO21
175815	29	-12	2191	CQ	OE6ORRDXA	
175830	28	-10	1550	CQ	TM79JO	
175900	33	-04	1547	CQ	TM79JO	
175900	20	-05	1472	CQ	KD9YLL	EM49
175915	16	-17	2497	CQ	ZS4JAN	RG30

Band Activity

175900	20	-05	1472	CQ	KD9YLL	EM49
175900	16	-17	909	WB9W	V47JA	-14
175900	15	-17	691	RK9UM	IU0JTW	-17
175915	32	-06	2391	V47JA	OS8A	JO20
175915	31	+02	1738	V47JA	EA3EQS	JN01
175915	29	-12	2188	<...>	OE6ORRDXA	RR73
175915	25	-04	725	V47JA	F5IDJ	-10
175915	25	-15	988	V47JA	RW3LL	KO54
175915	23	-06	559	V47JA	R6AA	KN95
175915	23	-06	659	R8LCM	CT3MD	IM13
175915	22	-13	784	CQ	F6HRP	IN88
175915	19	+01	1688	V47JA	WB9W	R-01
175915	17	-15	1453	V47JA	IU8SDA	JN71
175915	17	-15	1172	V47JA	SP7CDG	-05
175915	16	-17	2497	CQ	ZS4JAN	RG30
175915	13	-09	1547	<...>	AI4FR	EL88

RX Frequency

175130	18	-15	1469	CQ	KD9YLL	EM49
175148	TX	+00	1580	KD9YLL	KE2AMY	FN30
175700	18	-06	1469	CQ	KD9YLL	EM49
175815	TX	+00	1580	KD9YLL	KE2AMY	FN30

Open-Source 3D Design

Don't like the case? Change it?

3d Printed
Battery case +
ATU 100 mod



Fan Mod
rKayakr



Side Rails
John Oakes



**Hermes-style
Aluminum
"brick"**
SA2EIT



10" Screen and Encoder Mod
[William Lee Hemmingsen](#)

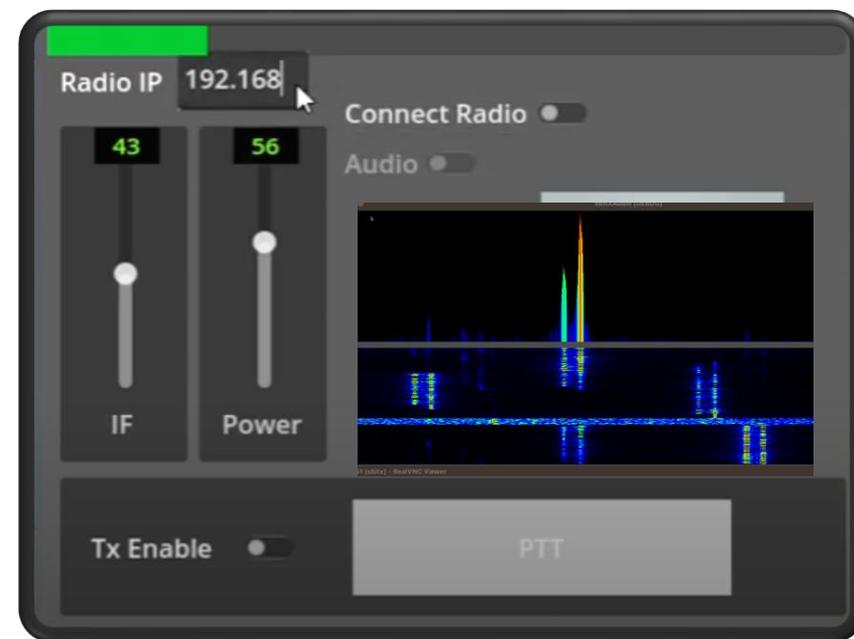
My mods...

Full CAT **Hamlib/rigctld** support.

Remote Transmit via VOIP Audio.

(In progress...)

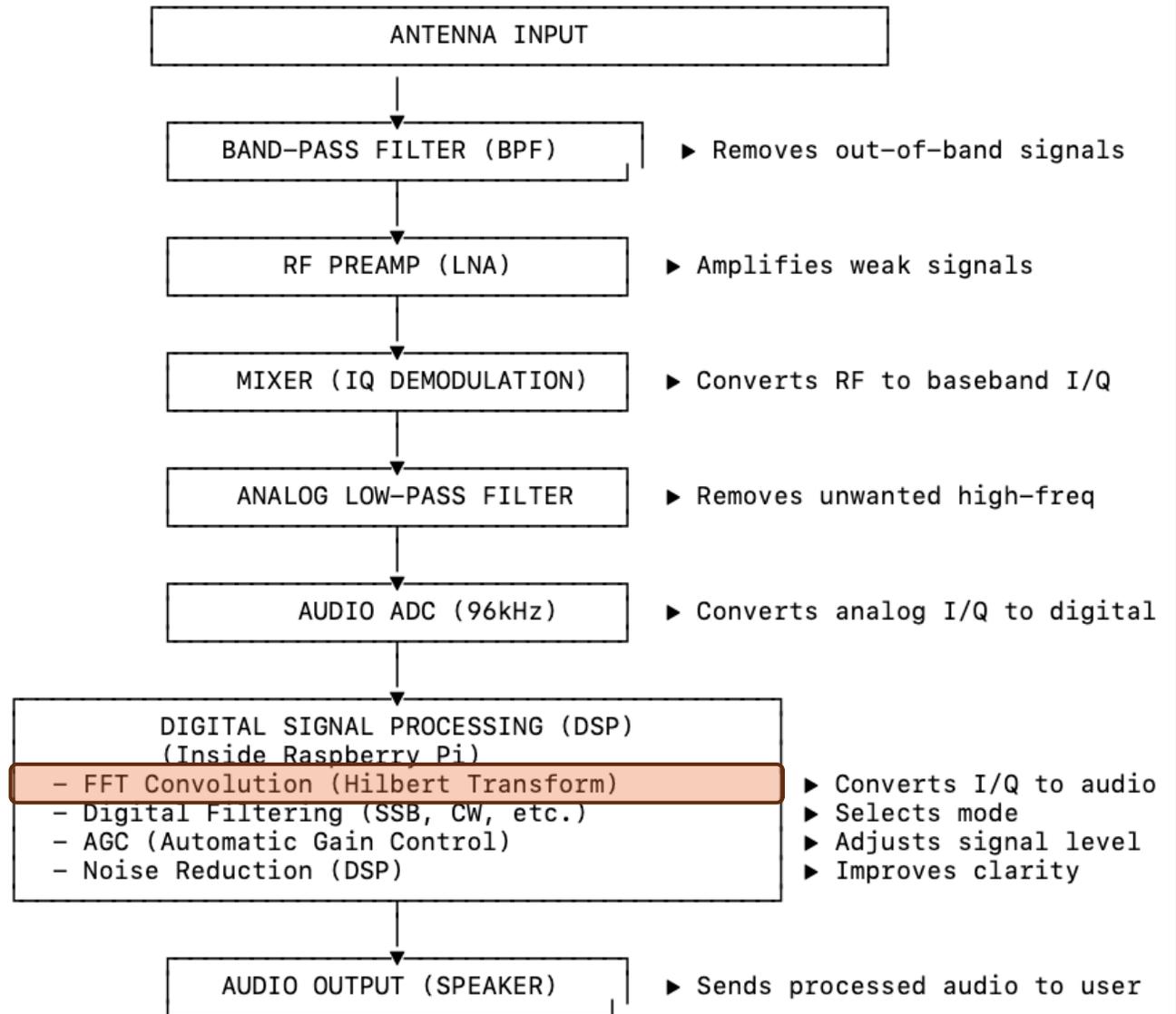
- **HPSDR** Support for Thetis
- FFT-based **Auto-tune** and **Auto-scan**



↑ Hamlib commands

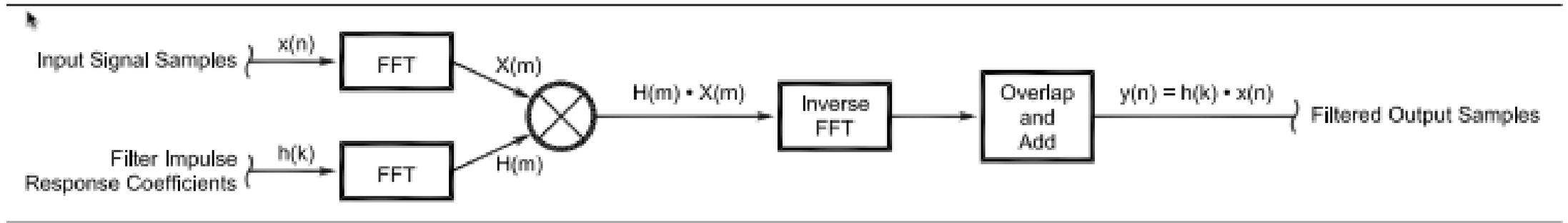
Basic Principle

1. Standard BPF + RF PREAMP
2. Quadrature Mixer RF to I/Q
3. Analog-digital conversion to “audio range”
24Khz center
4. FFT Convolution “magic”



Convolution Filtering

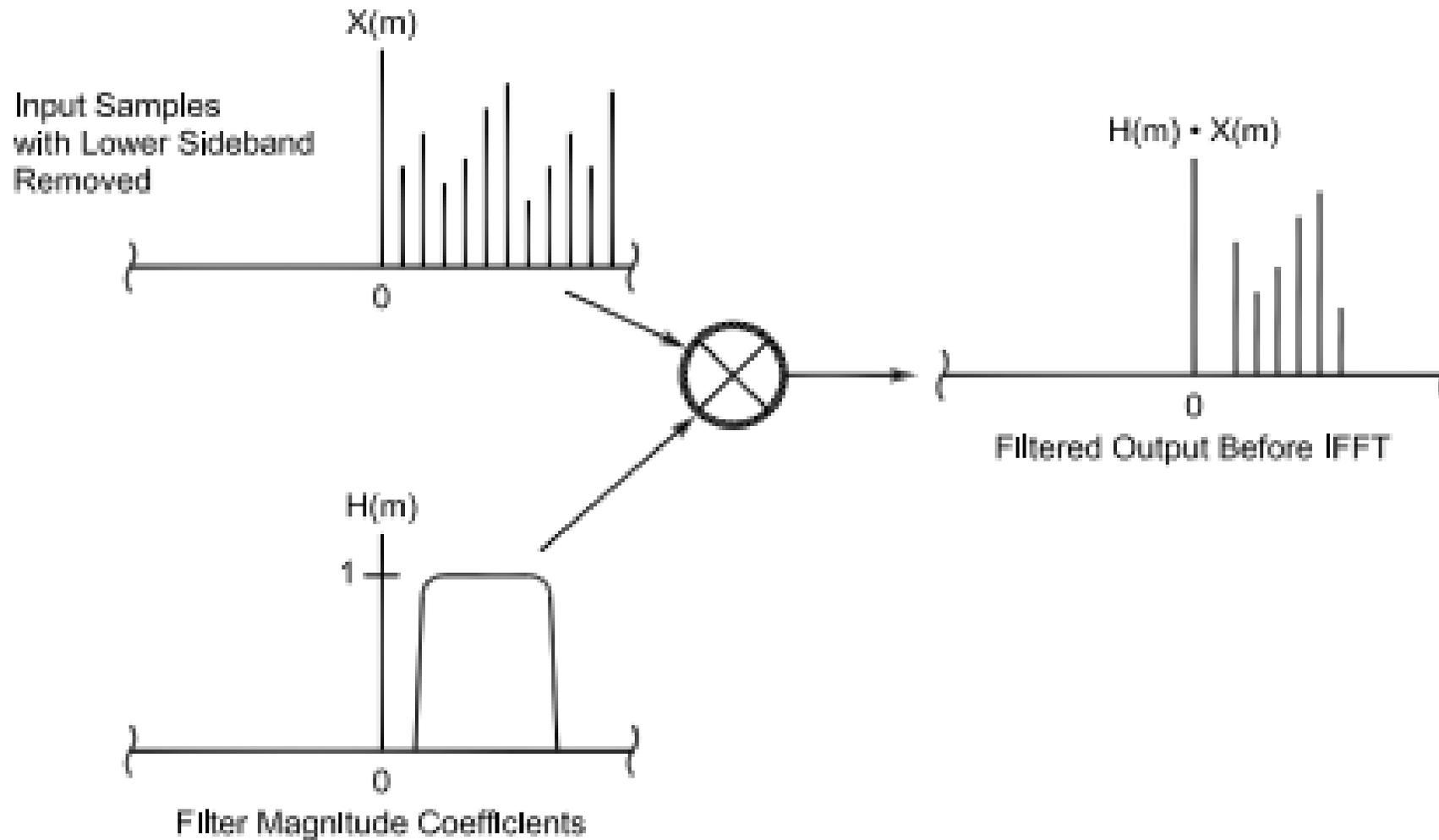
Unusual, but useful math



See: "[A Software Defined Radio for the Masses](#)" – by Gerald Youngblood (AC5OG)

The full story [here](#)

Convolution Filtering

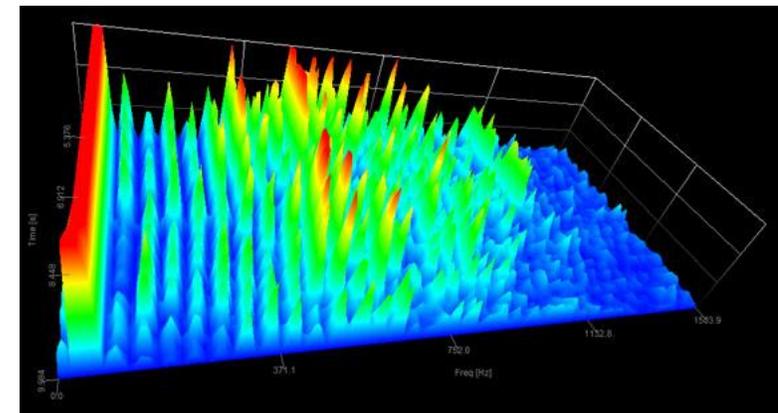


What's awesome about this method?



FFT BINS are easy to do complex things with.

Filtering -- Measuring -- Scanning -- Audio Processing



DEMO

- Bands and VFO
- Adjusting controls
- Various types of Filtering
- IF / POWER
- Antenna Tune
- FT8
- SSB
- CW
- Apps

How to Get it Working

1. Assemble it with these [instructions](#).
2. Plug in any HDMI monitor, Keyboard, Mouse and an antenna.
3. Turn it on, enter your call sign and grid location.
4. Listen around, try some SSB, try the FT8... it works?
5. Great, now throw the original SDCARD in the Garbage.
 - Buy a fast 32Gb SD Card.
 - Download [THIS Image](#).
 - Download [Balena Etcher](#) and burn image to SD.
6. Try the web interface, figure out your IP address, try the FT8, login to QRZ.
7. Turn on RealVNC, install it on your PC or Tablet and play with the Screen Size.
8. Have fun with the radio and all the apps!

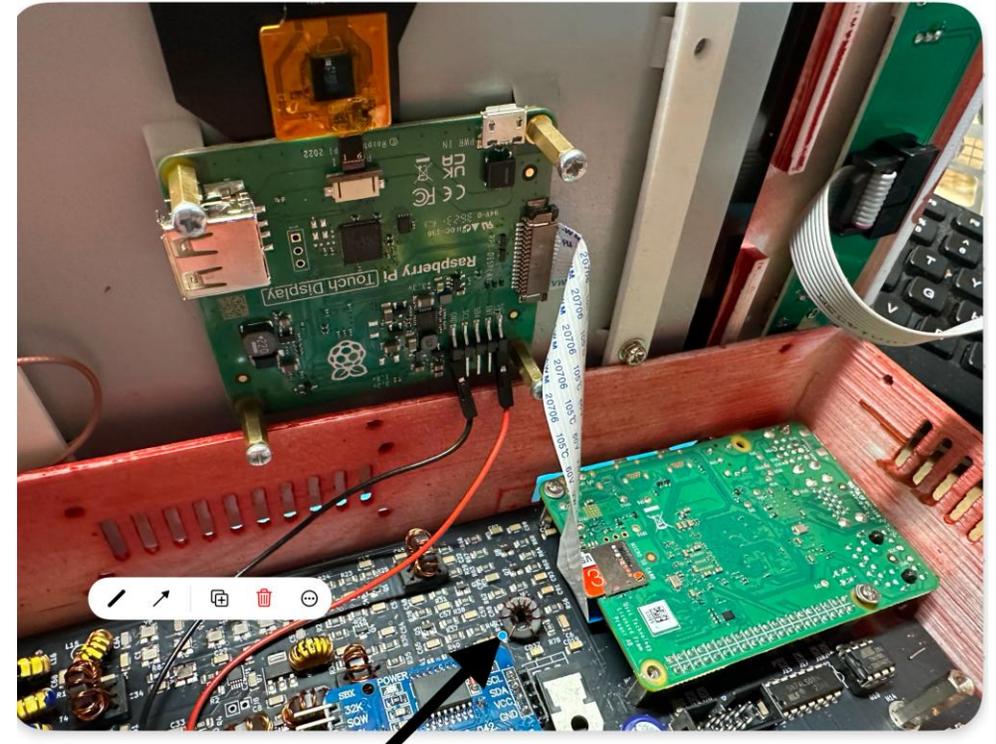
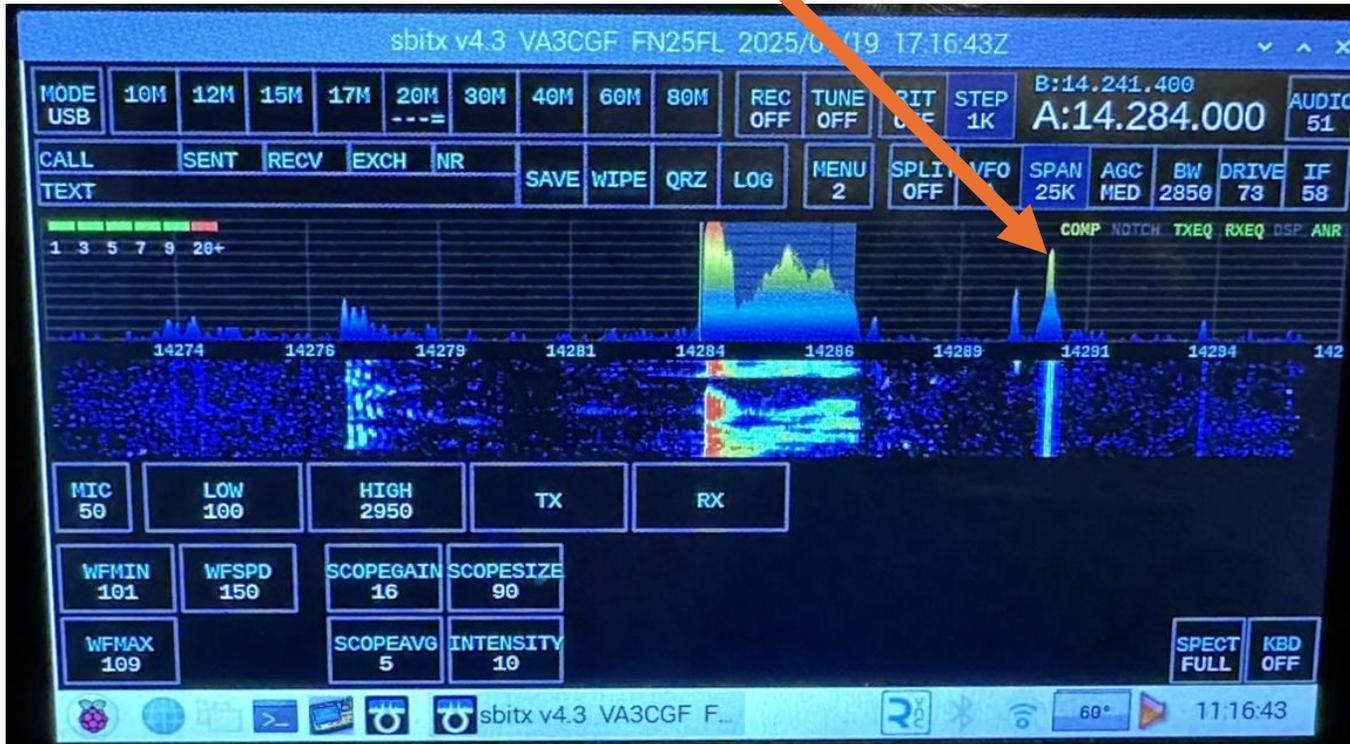
My Petty Grievances



1. **MIC** - Getting good SSB microphone in main audio is a problem, only designed for Electret. Use an AOM-5024—HD-R. A small, cylindrical, silver-colored microphone component with two pins extending from the bottom.
2. **USB MIC** – works great, but with delay (working on this)
3. **RealVNC** - driver is problematic, its better for sizing but slow as hell if you use it. It works fine without the driver, but then it's harder to size the screen.
4. **DSP** - Some digital audio processing with EQ clips on headphones (not on speaker)
5.  You could blow up your board with inverted +/- (There is fix on Etsy).

And...

A line in the waterfall!



The culprit

Fix, move ribbon away from that bugger...
had to buy bigger ribbon

Enjoy!



1. **Cost** is very reasonable.
2. **Display** is excellent **waterfall** and **spectroscope** display.
3. **Filtering** is comprehensive and gets better every revisions with ANR, NOTCH, RX and TX parametric EQ, DSP, Low Cut/High Cut.
4. **Digital modes** “just work”.
5. **Power** is POTA-friendly, sips batteries.
6. **Standalone Operation**, plug in a battery, headset and an antenna.
7. **Reliable:** So far, so good.

Support

- Groups.IO [SBITX V2](#)
- Discord Group [W9JES](#)
- Facebook Group [SBITX](#)
- Farhan's [Site](#)
- [sBitx 64 Command List](#)



Thought for the Day...

The radio amateur is progressive... He keeps his station abreast of science.

It is well-built and efficient.

His operating practice is above reproach.

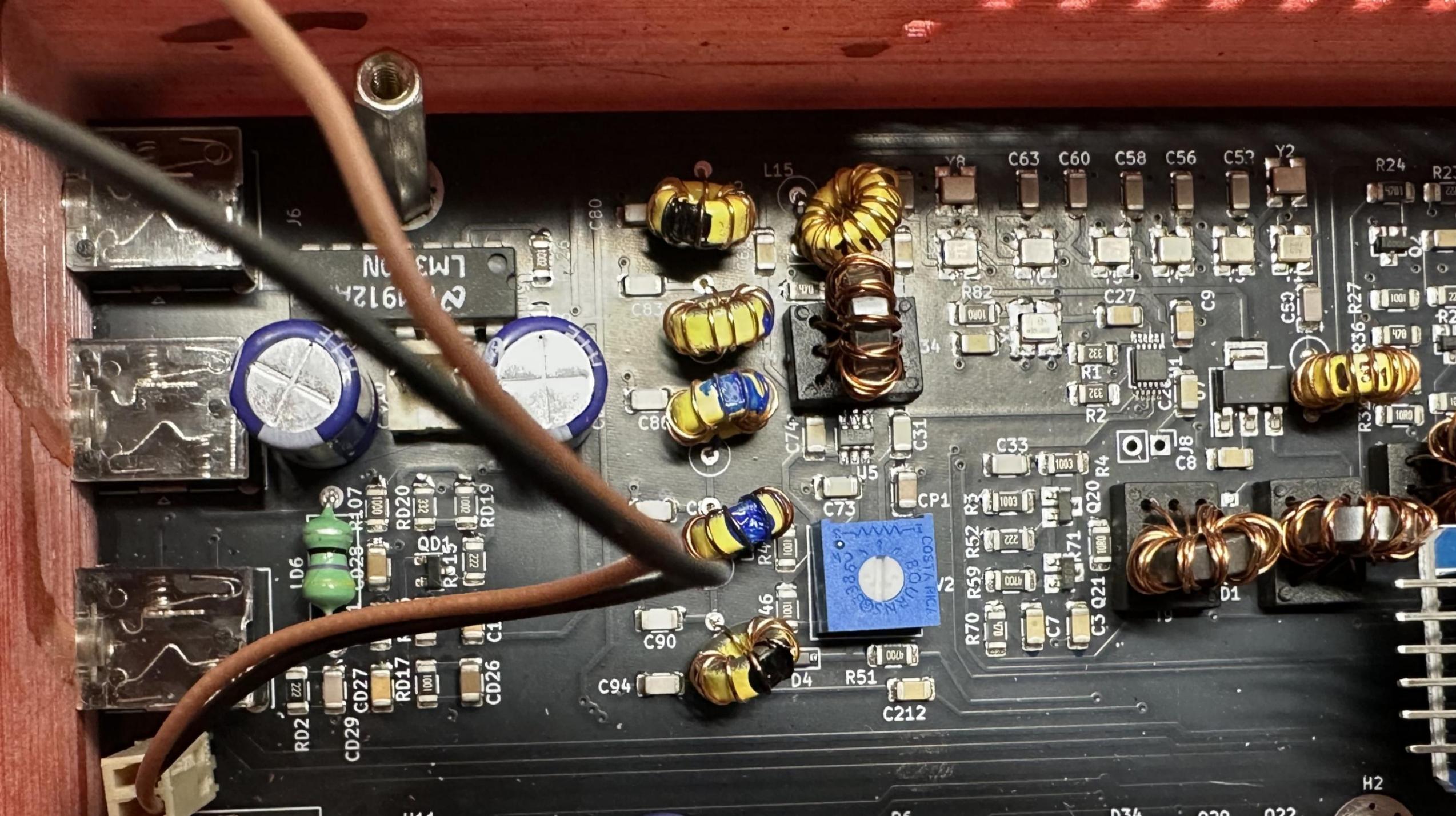
— Paul M. Segal,
W9EEA (Amateur's
Code, 1928)

Technical Details

- **40 watts on 80m and 40m, goes down to 20 watts on 15m and 6 watts on 10m**
- **Passive FET mixer** without early amplification with +28 dBm IIP3
- **6 pole, 25 KHz bandwidth crystal filter front-end** suppresses opposite sideband by 70 db.
- **24 bit High dynamic range IF system** to preserve all closed spaced signals of digital modes.
- **General Coverage HF reception**
- **Ring free Pass Band Tuning** for working CW and SSB without fatigue
- **Audio Recording** of brag tapes
- **Automatic decoding of in-built modes** like FT8, CW, RTTY, PSK31
- **AGC settings** of Fast, Medium and Slow
- **Band stacking VFOs**, 4 frequency/modes on each band
- The PA uses **IRFZ24N transistors** that can be easily replaced even if you blow them up
- **3 section low pass filters** for clean transmit output.
- **Two VFOs with split function**, incremental tuning.
- **Speech compression** for SSB
- **Better than 43 dbc suppression of spurious emissions**

POTA Mobile





J6

LM37
49124

ID6

RD2

CD29

RD17

CD26

RD20

RD15

RD19

107

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C94

C90

D4

46

100

100

100

100

R51

C212

C74

U5

C73

CP1

R3

R70

R59

R52

R3

C7

700

22

1000

1000

1000

1000

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C83

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