

S53WW

HF RIG TX

RIS 2021

12.03.2021

Zakaj so tehnični podatki oddajnika pomembni?

- Regulativa (AKOS, OFCOM, FCC, ...)
 - Določajo lastnosti oddajnika izven amaterskih pasov
- Sobivanje na bandu
 - Neke dogovorjene minimalne lastnosti ne obstajajo

Kateri tehnični podatki oddajnika so relevantni za radioamatersko KV postajo in „sosedom“ prijazno sobivanje?

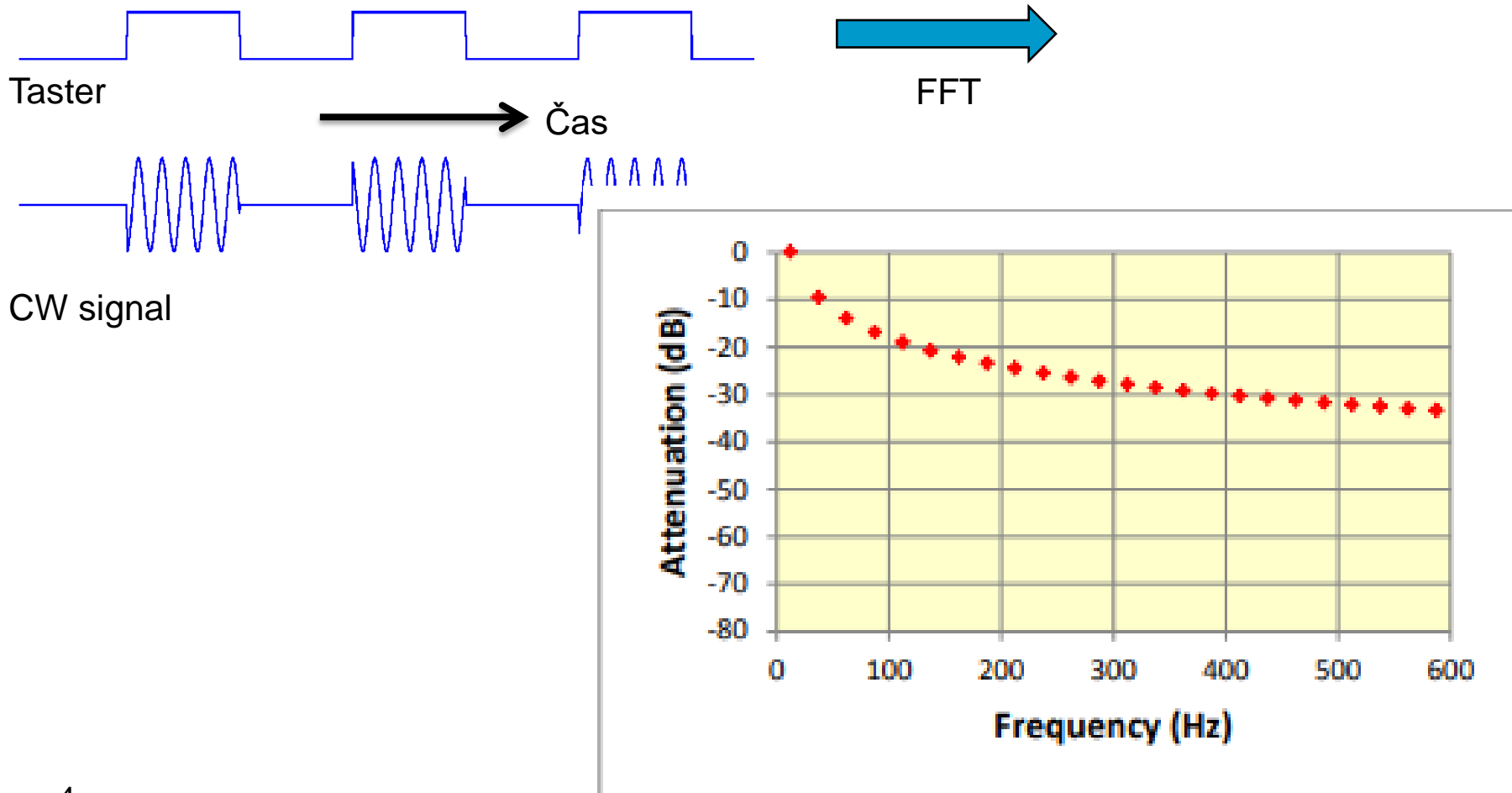
- **Odvisno od načina dela – CW, SSB, FT8**

Kakšne naj bodo zahteve?

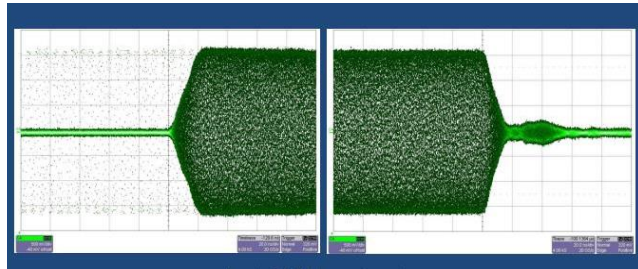
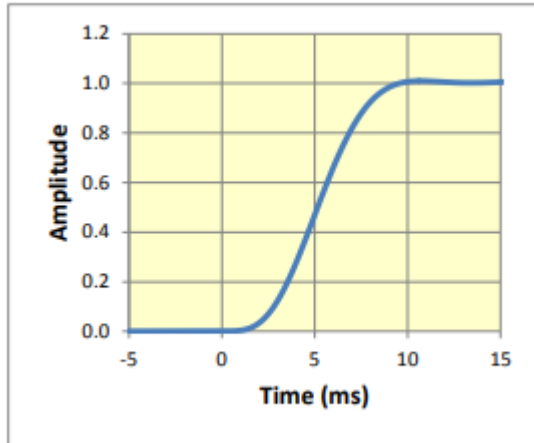
- **Odvisno od TX moči – 5W, 100W, 1500W**
- **Odvisno od tipa aktivnosti – DXanje, Contest**

CW

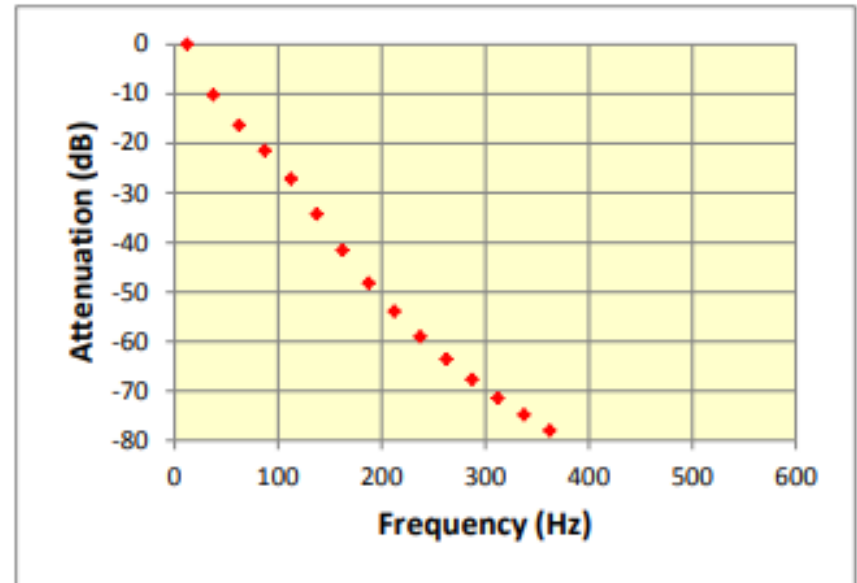
- **CW = OOK (on/off keying)**



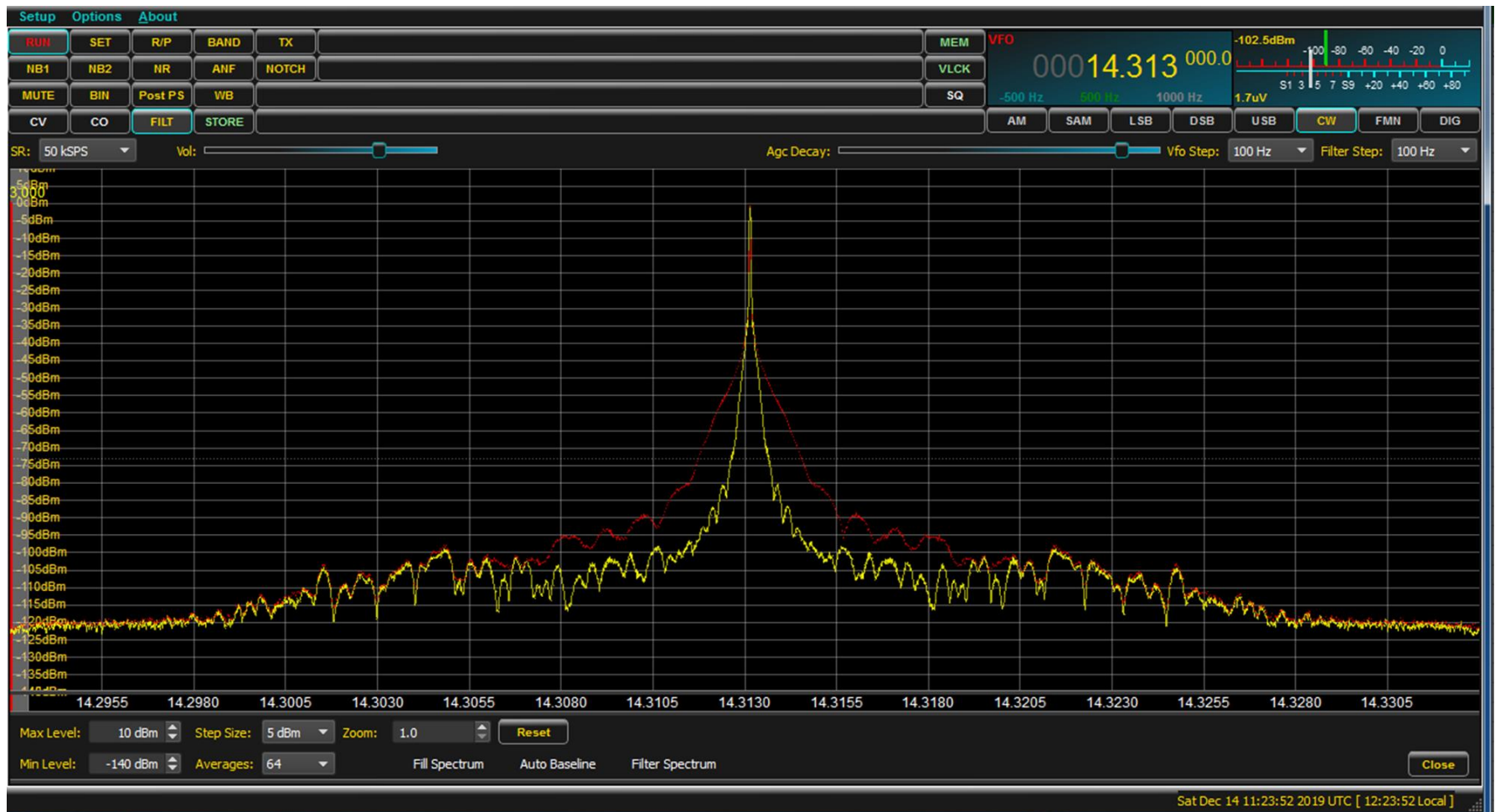
CW – oblika tasanja



FFT



CW – primer meritve



FTDX101d: vpliv dvižnega časa - rumena 4ms / rdeča 1ms

CW – primer meritve – zoom-in

14MHz

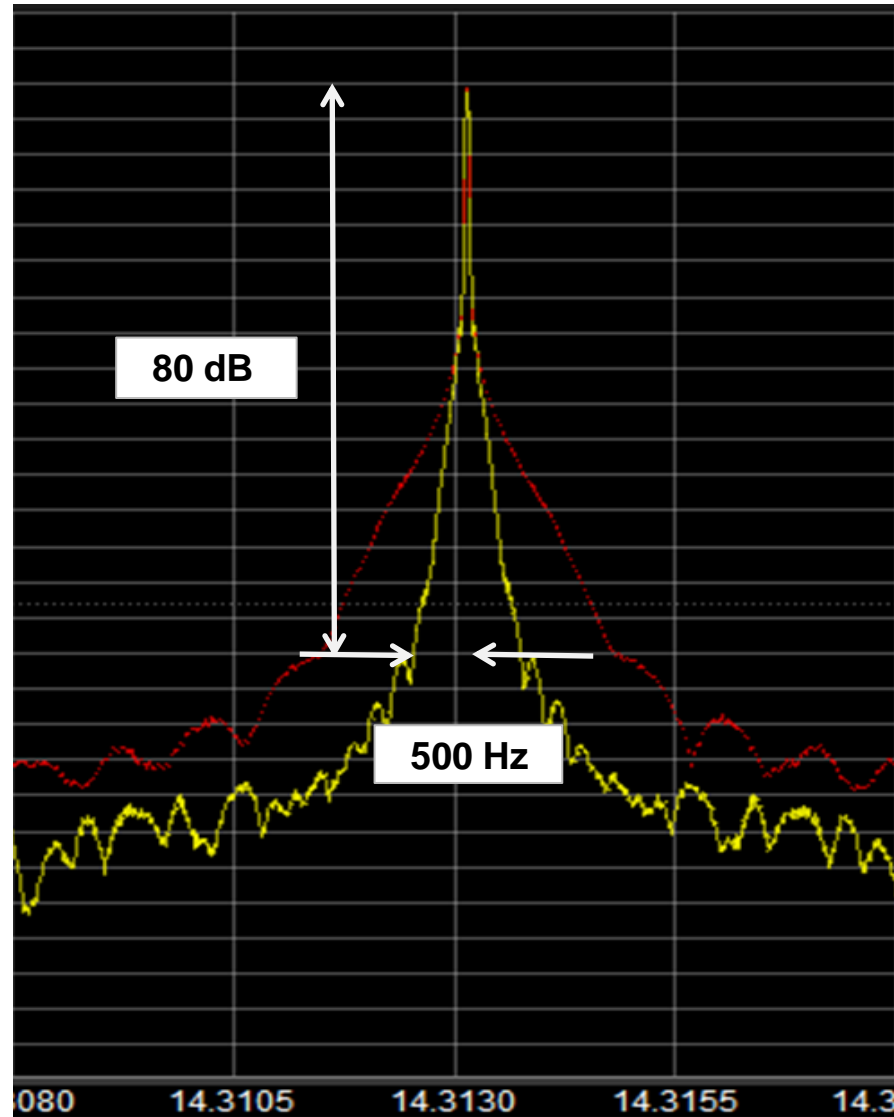
Antena NF → 25 dB

BW → 100Hz

Nivo šuma → -129 dBm

“Sosed” → 59+30dB → -43dBm

DR → **84 dB**



FTDX101d:

rumena 4ms / rdeča 1ms

CW – kako meritev podaja ARRL

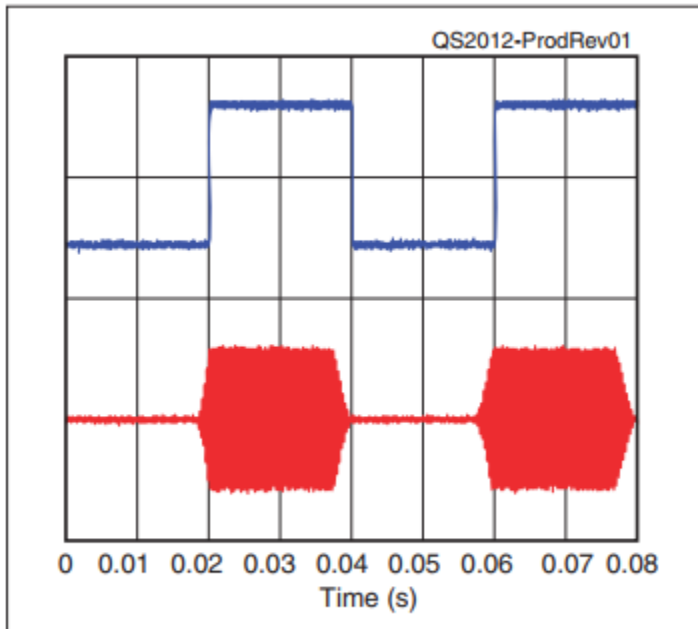
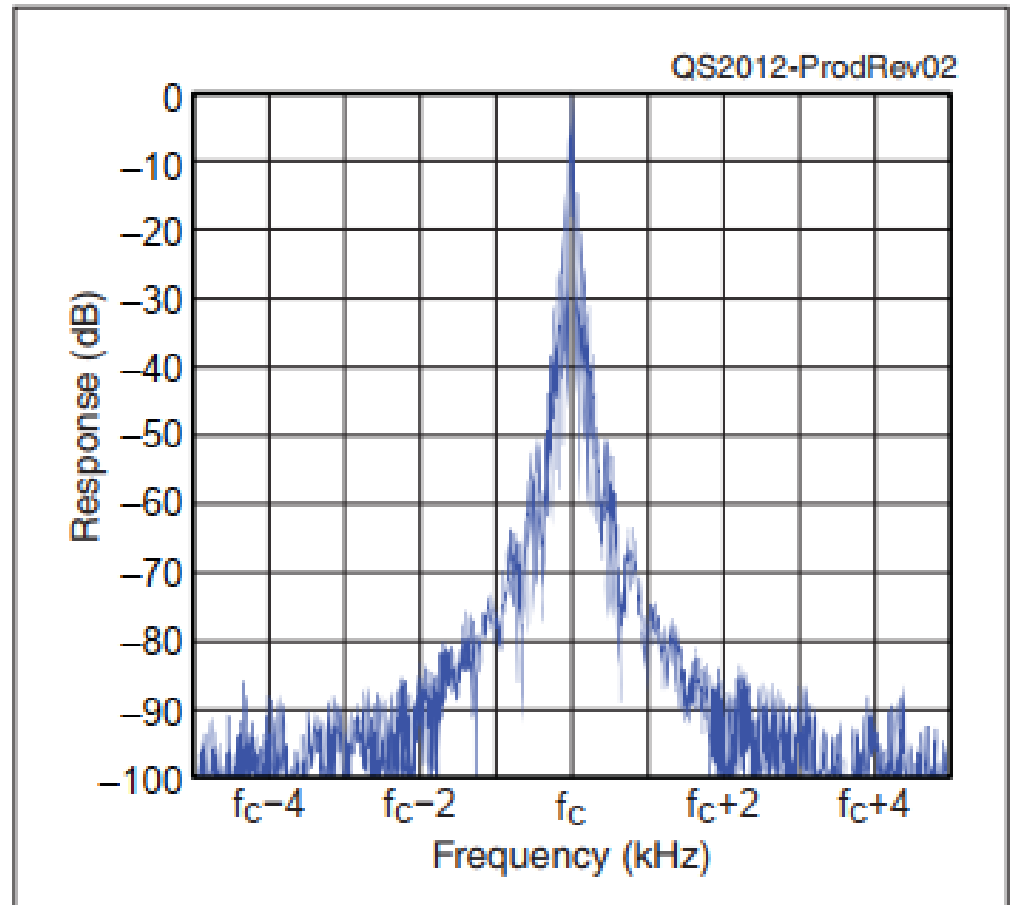


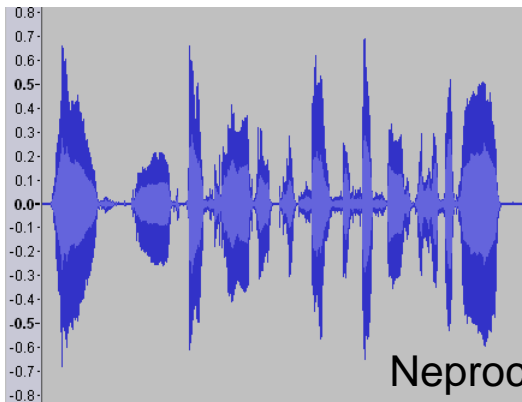
Figure 1 — CW keying waveform for the Yaesu FTDX101MP showing the first two dits in



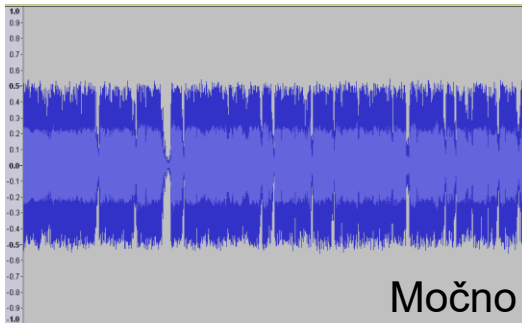
FTDX101mp: QST product review (ARRL)

SSB

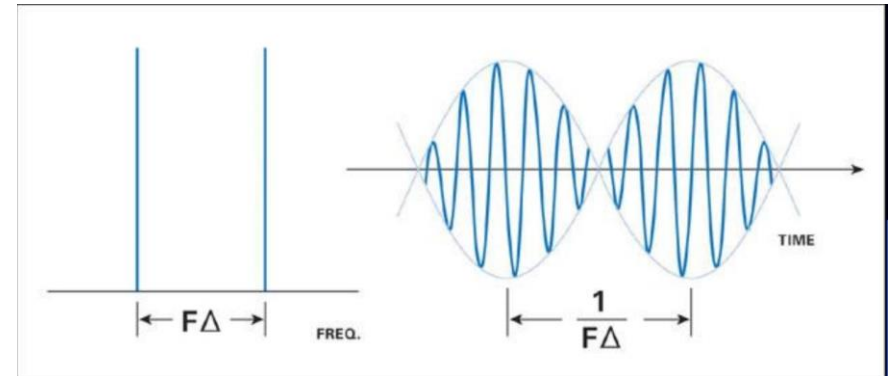
- govor ima zelo veliko razmerje med vršno in povprečno močjo (>20:1)
- zato je nujna uporaba „govornega procesorja“ (speech processor, clipper), ki to razmerje spusti na cca. 5:1 – s tem se poveča povprečna moč in izboljša razumljivost



Neprocesiran govor

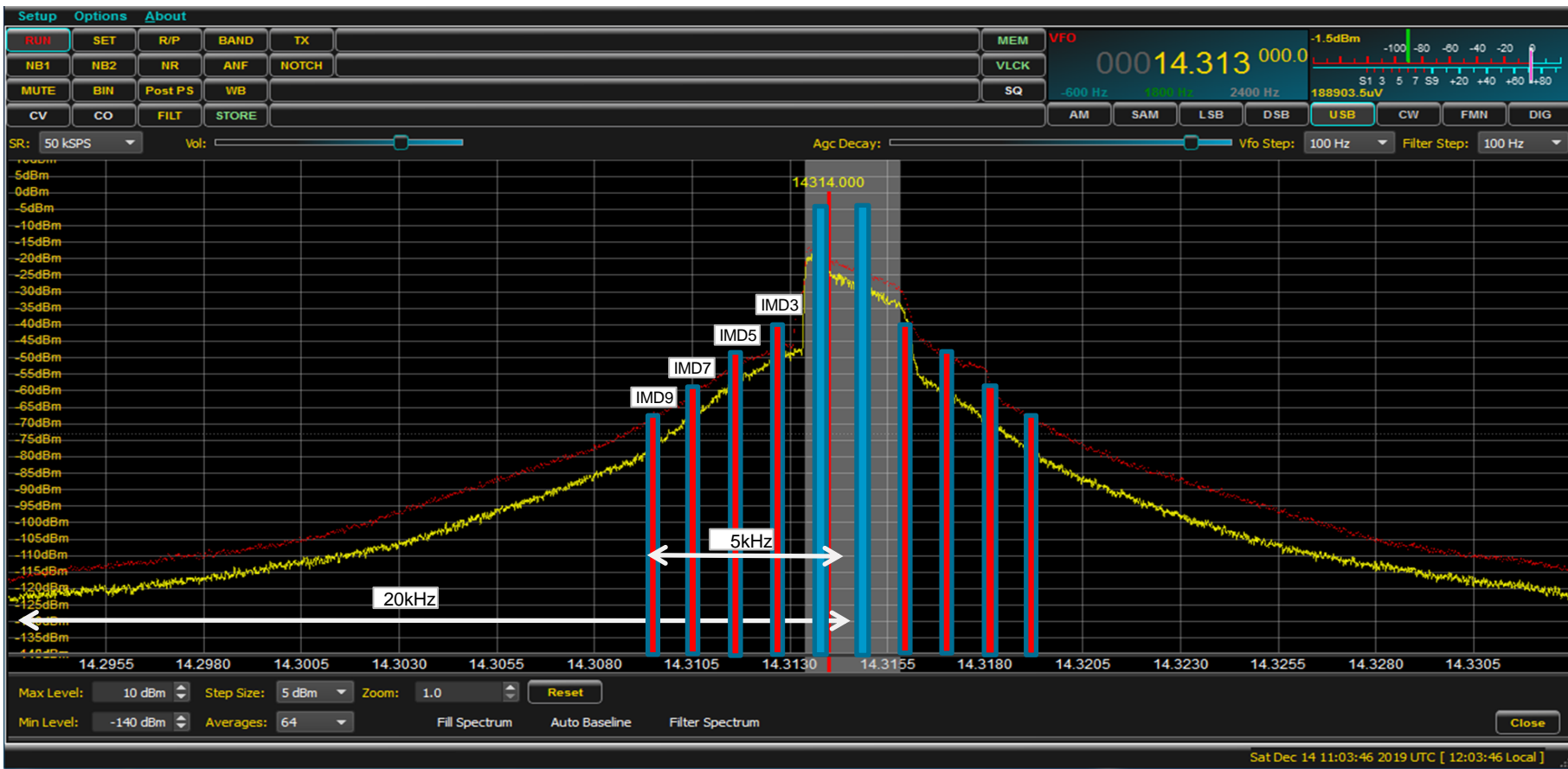


Močno poklipan govor



Dvotonski signal

SSB – primerjava med dvotonskim in šumnim vzbujanjem



FTDX101mp @50W PEP:

IMD meritve iz QST product review (ARRL)

Third-order intermodulation distortion (IMD) products: Not specified.

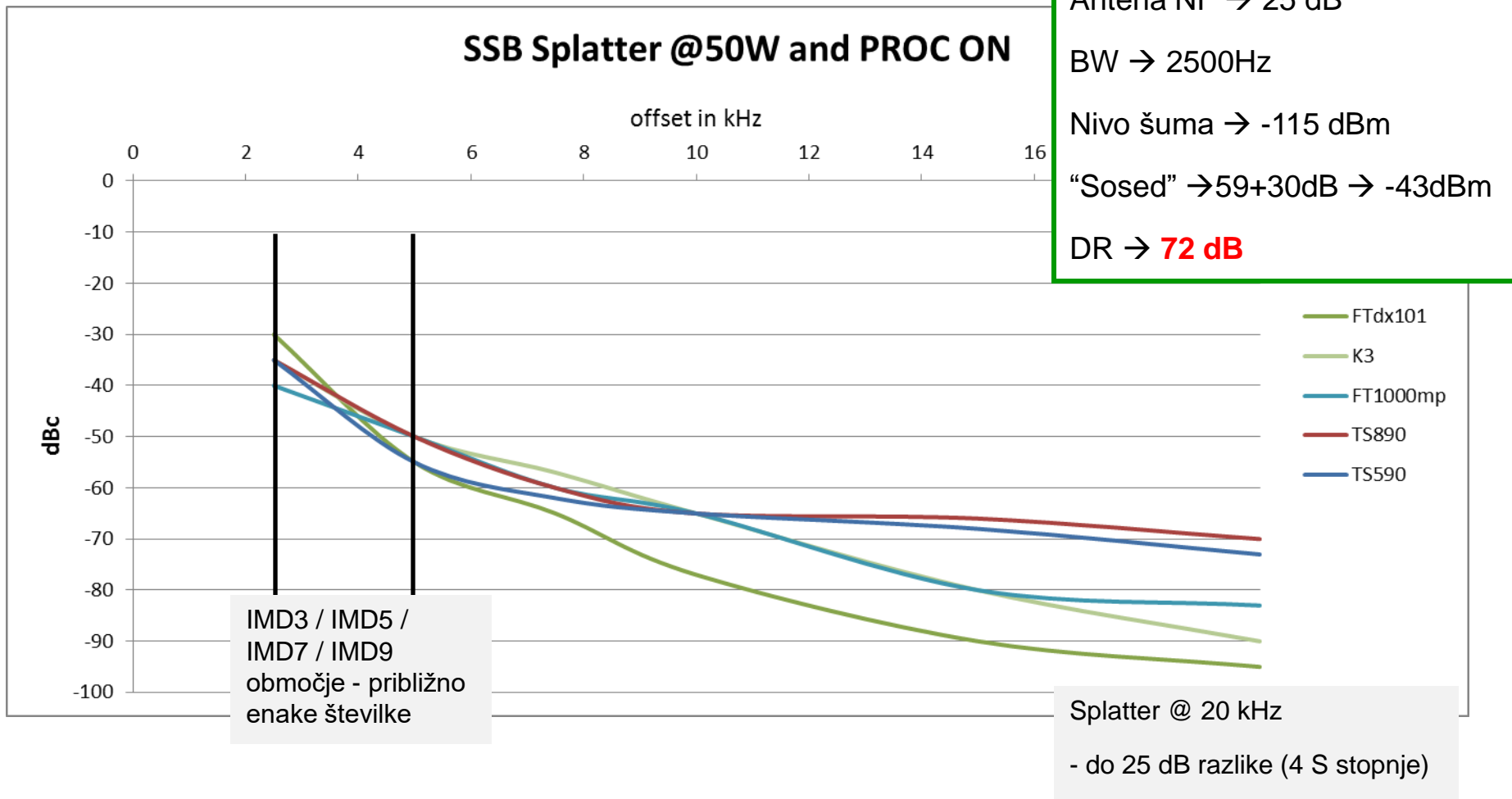
Emission standards:

- 3rd/5th/7th/9th order, 200 W PEP:
 - 38/-46/-51/-57 dB (HF typical)
 - 33/-40/-45/-51 dB (worst case, 17 m)
 - 37/-44/-47/-54 dB (14 MHz)
 - 40/-44/-51/-58 dB (50 MHz)
- At 50 W PEP RF output:
 - 35/-44/-54/-63 dB (14 MHz)
 - 40/-47/-58/-72 dB (50 MHz)



SSB – primerjava

SSB Splatter @50W and PROC ON



14MHz

Antena NF → 25 dB

BW → 2500Hz

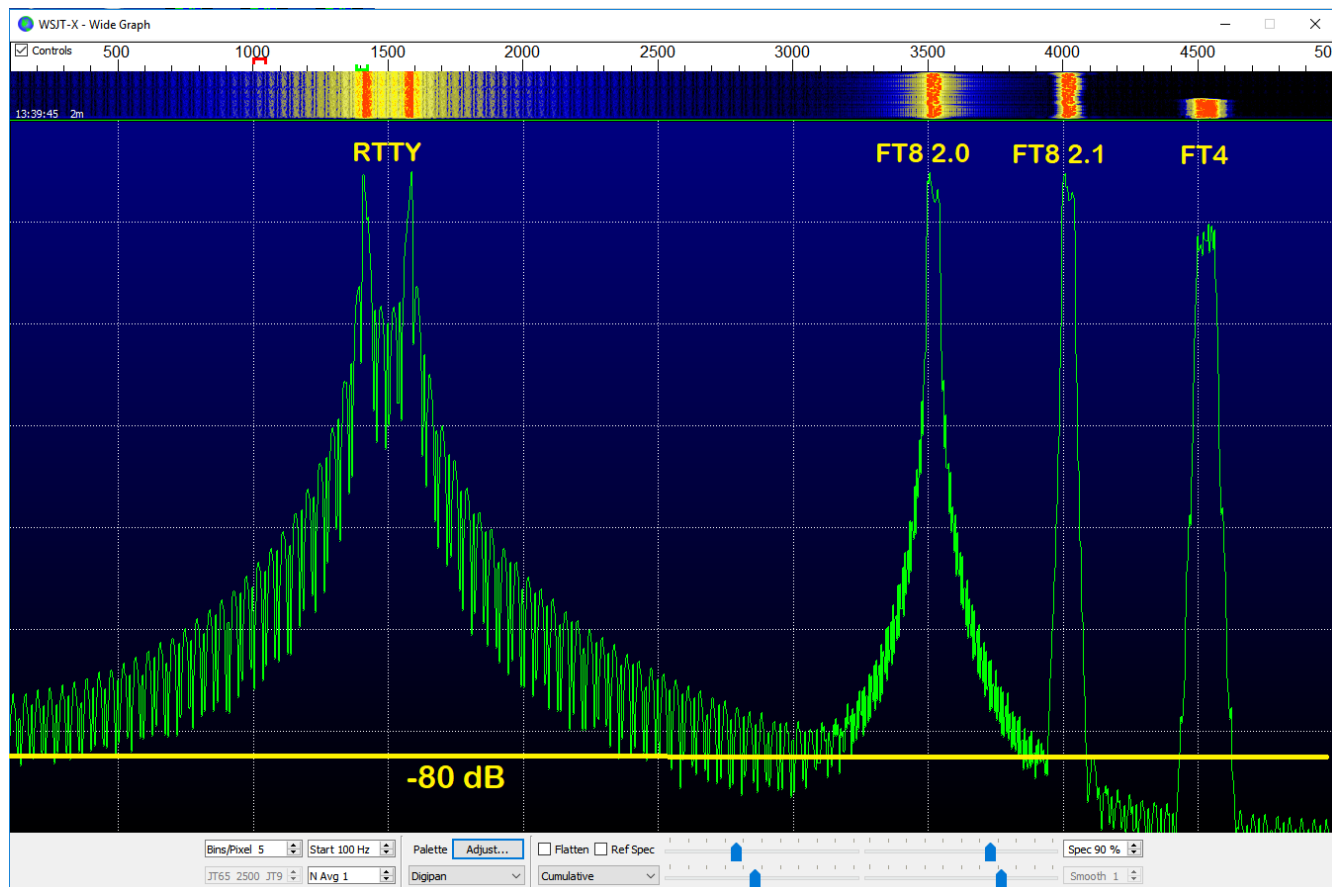
Nivo šuma → -115 dBm

“Sosed” → 59+30dB → -43dBm

DR → **72 dB**

FT8 – GFSK

- FSK modulacija z Gausovim oblikovanjem prehodov
- signal konstantne amplitude – kot CW → fulpover



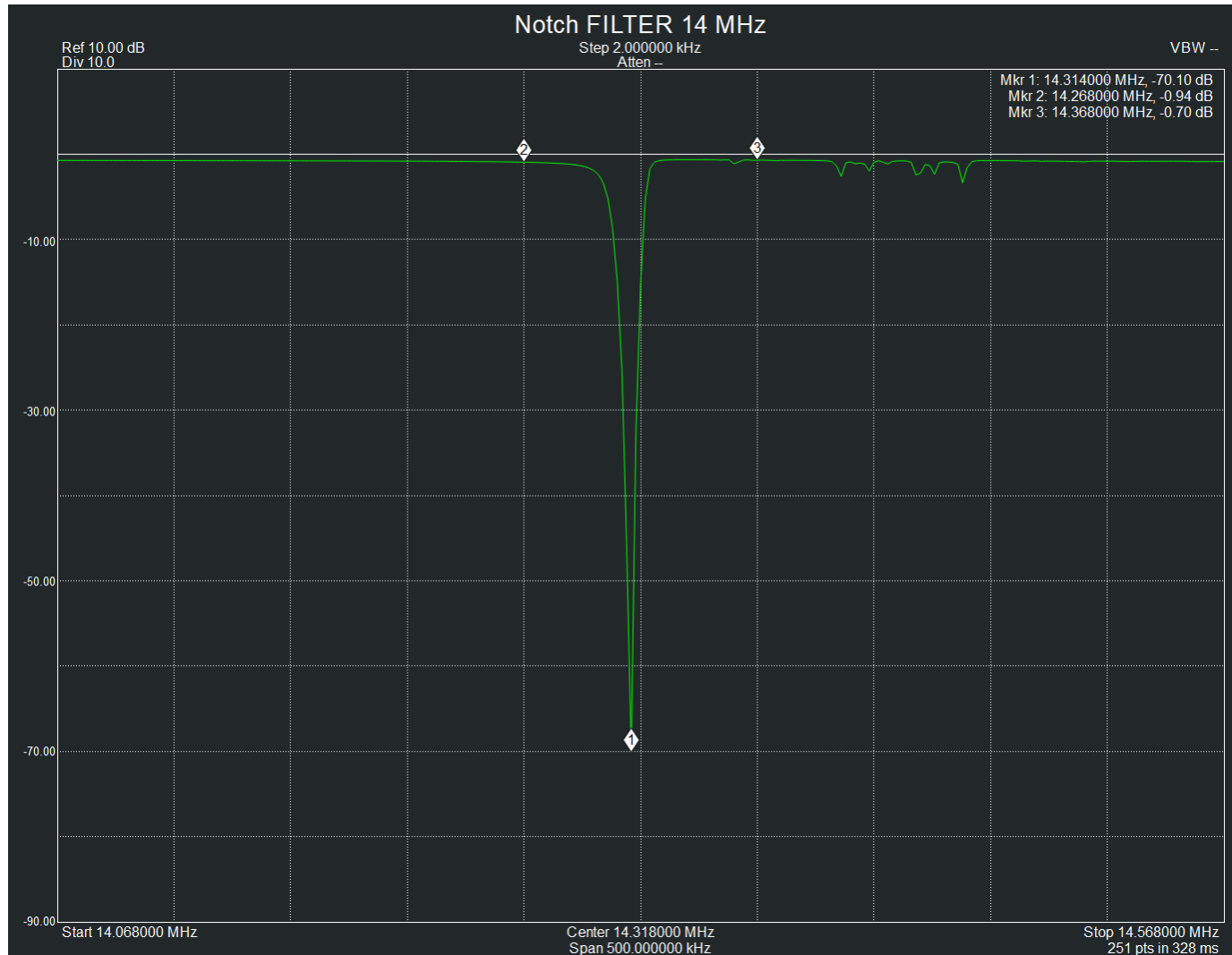
TX šum

- v določenih primerih je zelo pomemben nivo oddajnega šuma
 - Inband postavitve
 - Multi-multi postavitve
 - Sosed, ki je zelo blizu (najine antene „se vidijo“)

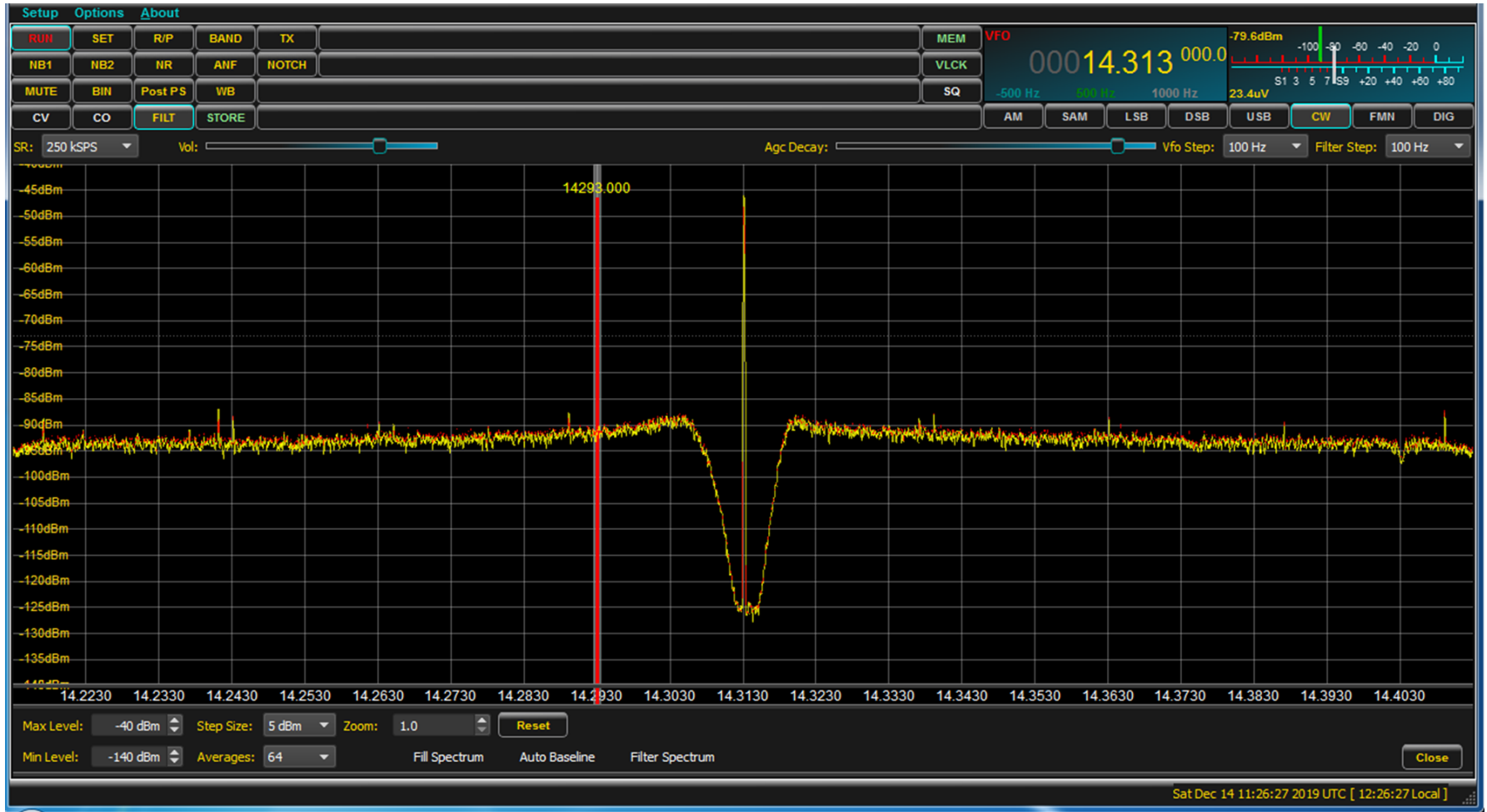
Meritev ni trivialna, ker lahko merimo šum merilnega instrumenta

- Uporabimo zaporni filter, ki potlači nosilec
- Za meritev uporabimo SDR sprejemnik

TX šum – kristalni zaporni filter



TX šum – primer meritve



TX šum – primerjava

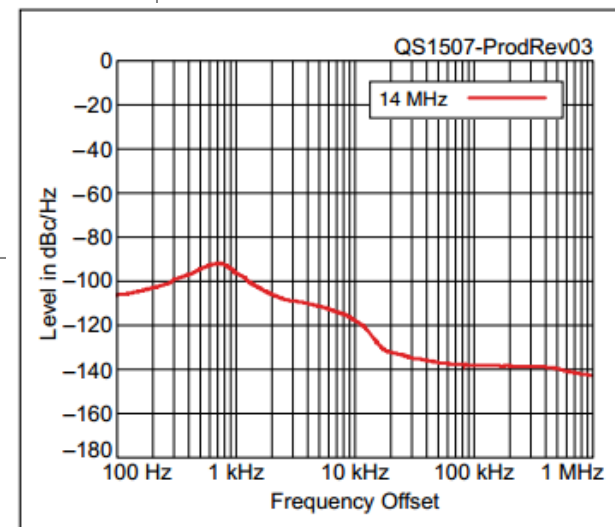
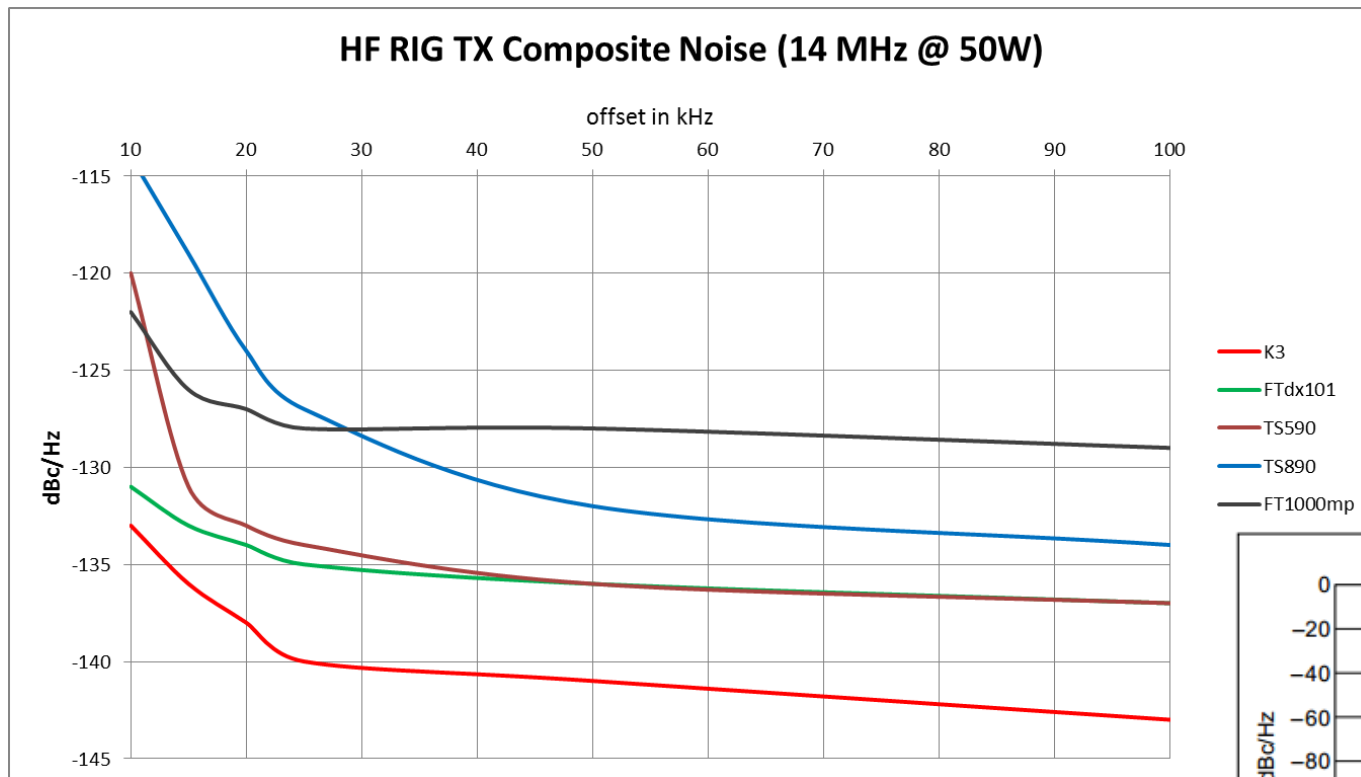


Figure 3 — Spectral display of the TS-590SG

Povzetek

- **nikoli ne kupujemo KV postaje s pomočjo raznih rang list**
- **raje poiščimo ustrezno postajo glede na predvideno rabo, lokacijo in antene**
- **s poceni SDR sprejemniki lahko enostavno pomerimo CW in SSB spekter oddajnika**

TNX es 73 de
Robi/s53ww

