

Transmit Setup and calibration instructions for crystal controlled Avala-01 and G40/3020 using Genesis Radios GSDR 32bit update 21022014

The screenshot displays the Genesis Radio 32bit v2.0.16 software interface. The main window shows a spectrum display with a signal at 7.069 981 MHz. The interface is divided into several sections:

- Top Panel:** VFO A and VFO B are both set to 7.056 457 MHz with 40M RTTY mode. LOSC is set to 7.046 457 MHz.
- Left Panel:** Includes a POWER section with MON, TUN, MOX, and MUT buttons. Below are sliders for AF (20), RF (21), PwR (50), and AGC (Med). There are also SQL (110) and SQL (150) settings.
- Right Panel:** Shows a signal strength of -110.7 dBm. Below are band selection options (160, 80, 60, 40, 30, 20, 17, 15, 12, 10, 6, 2) and VFO A Mode (LSB, USB, DSB, WFM, CW, FMN, AM, SAM, SPEC, DIGL, DIGU, DRM). VFO A Filter is set to 1.0k.
- Bottom Panel:** Includes Memory option (VFO A, ZAP, VFO Lock, VFO Sinc, MR, MS, MC), VFO Tune Step (500Hz, 1kHz), DSP VFO A (NR, ANF, NB, NB2, BIN), Display Mode (Panafall_inv, AVG, Peak), Mode Specific Controls - CW (CW Speed: 25, Semi Break In, CW Pitch (Hz) 600, VAC), and Display zoom (1x, 2x, 4x, 8x, 16x, 32x, Pan, Zoom).

The spectrum display shows a signal at 7.069 981 MHz with a power level of -72.9dBm. The frequency is 23524.1Hz. The CPU usage is 8.1%.

First, lets review RX setup

Frequency Calibration:

1. First take the crystal frequency and divide by 4
2. Enter that into the freq box. Doesn't have to be exact. I left it at default setting.

The screenshot displays the PowerSDR software interface with several windows open. The main window shows the 'Setup' tab with the following settings:

- VFO A:** 7.058 649, 40M RTTY
- VFO B:** 7.094 999, 40M RTTY
- LOSC:** 7.047 000
- Signal:** -112.6 dBm
- Band - HF:** 40, 30, 20, 17, 15, 12, 10, 6, 2
- VFO A Mode - CW:** CW, FMN, SPEC, DIGL, DIGU, DRM
- VFO A Filter - 1.0k:** 1.0k, 800, 750, 600, 500, 400, 250, 100, 50, 25, Var 1, Var 2
- Low:** 100, High: 1100
- Width:** [Slider]
- Shift:** [Slider]
- Display:** -64.0dBm, 23524.1Hz, 7.070 524 MHz
- Mode Specific Controls - CW:** CW Speed: 25, Semi Break In, CWX: 1, 4, 2, 5, 3, 6, CW Pitch (Hz): 600, VAC
- Display zoom:** 1x, 2x, 4x, 8x, 16x, 32x, Pan, Zoom

The 'PowerSDR Setup by GenesisRadio' window is open, showing the 'Radio Model' section with 'Genesis G40' selected and a frequency of 7.045000. The 'Misc Setup' section has several options checked, including 'Automatic focus', 'Receive Only', 'USB Si570 board', 'Show/Hide: F10', 'Drag filters', 'Drag spectrum', 'New VFO look', 'On Screen Display', 'Continuous tuning', and 'Button magnifier'.

A 'Calculator' window is open in the bottom left, showing the result 7.04625.

The main window also shows a spectrum display with a signal peak at 7.070 524 MHz. The CPU usage is 8.2%.

Using a signal source of a known frequency, select DSB and tune VFO A to that frequency

The image displays the PowerSDR software interface, which is used for software-defined radio (SDR) operations. The main window is titled "Genesis Radio 32bit v2.0.16" and features a menu bar with options like Setup, Wave, Equalizer, CWX, Voice Messages, Wizard, Compact screen, DX Cluster, XTRV, Debug, and About.

On the left, the "PowerSDR Setup by GenesisRadio" dialog box is open, showing the "Genesis config" tab. The "Radio Model" section has "Genesis G40" selected. The "Misc Setup" section includes options for "Automatic focus", "Receive Only", "USB Si570 board", "Drag filters", "Drag spectrum", "New VFO lock", "On Screen Display", "Continuous tuning", and "Button magnifier".

In the bottom-left corner, a Windows "Calculator" application is open, displaying the value "7.04625".

The main interface shows three VFOs (VFO A, VFO B, and LOSC) with their respective frequencies: VFO A is at 7.070 000 MHz (40M RTTY), VFO B is at 7.094 999 MHz (40M RTTY), and LOSC is at 7.047 000 MHz. The central display area shows a spectrum plot with a prominent signal at 7.070 MHz. The signal strength is indicated as -63.9 dBm. The display also shows the current frequency of 7.018 671 MHz and a bandwidth of 23524.1Hz.

At the bottom, there are various control panels including "Memory option" (VFO A, ZAP, VFO Lock, VFO Simc), "Tune Step" (500Hz, 1kHz), "DSP VFO A" (NR, ANF, NB, NB2, BIN), "Display Mode" (Panafall_inv, AVG, Peak), "Mode Specific Controls - Phone" (Mic Gain, COMP, CPDR, VOX, GATE), and "Transmit Profile" (VoiceMessages, 1, 2, 3, 4, 5, 6). There are also zoom controls (1x, 2x, 4x, 8x, 16x, 32x) and a "Zoom" slider.

Select up or down arrows to the right of the frequency. Until it is close to on the center line.

The image displays the PowerSDR software interface, which is used for software-defined radio (SDR) operations. The main window is titled "Genesis Radio 32bit v2.0.16" and features several tabs: Setup, Wave, Equalizer, CWX, Voice Messages, Wizard, Compact screen, DX Cluster, XTRV, Debug, and About. The "Setup" tab is active, showing various radio parameters and settings.

On the left side, there is a "PowerSDR Setup by GenesisRadio" dialog box. It includes sections for "Radio Model" (with "Genesis G40" selected), "Misc Setup" (with "Automatic focus" and "Receive Only" checked), and "Filters" (with "F10" selected). The "Genesis G40" section shows a frequency of 7.046315. Below this dialog is a Windows "Calculator" application showing the value 7.04625.

The main interface shows three frequency displays at the top: "VFO A" at 7.070 000, "VFO B" at 7.092 898, and "LOSC" at 7.046 000. Below these is a spectrum display showing a signal at 7.069 839 MHz. The signal strength is indicated as -63.9 dBm. The interface also includes various control panels for "AF", "RF", "PWR", "AGC", "SQL", and "VFO A Mode - DSB".

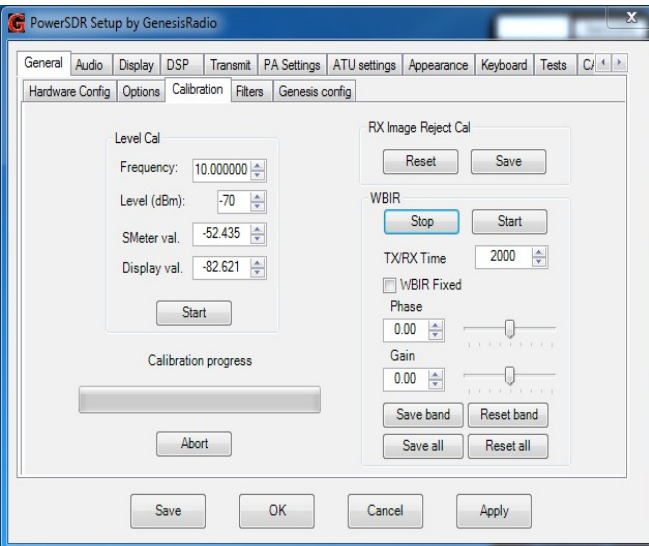
Select Display zoom, and adjust frequency until it is centered. Frequency Calibration is complete

The image displays the PowerSDR software interface during a frequency calibration process. The main window, titled "Genesis Radio 32bit v2.0.16", shows a spectrum display with a signal centered at 7.069 986 MHz. The signal strength is -63.9 dBm. The interface includes several control panels: "POWER" (MDN, TUN, MOD, MUT), "AF 20", "RF 80", "PWR 50", "AGC", "SQL 110", and "SQL 150". The "Display" panel shows a spectrum plot with a signal peak at 7.069 986 MHz. The "VFO A" and "VFO B" panels show frequencies of 7.070 000 and 7.092 898 respectively, both in 40M RTTY mode. The "LOSC" panel shows a frequency of 7.046 000. The "Signal" panel shows a strength of -63.9 dBm. The "Band - HF" panel shows a selected band of 40. The "VFO A Mode - DSB" panel shows "DSB" selected. The "VFO A Filter - 6.6k" panel shows a filter width of 6.6k. The "Memory option" panel shows "VFO A" selected. The "VFO Tune Step" panel shows "500Hz" and "1kHz" options. The "DSP VFO A" panel shows "NR", "ANF", "NB", "NB2", and "BIN" options. The "Display Mode" panel shows "Panafall_inv" selected. The "Mode Specific Controls - Phone" panel shows "Mic Gain" at 35, "COMP" at 3, "CPDR" at 2, "VOX" at 200, and "GATE" at -40. The "Transmit Profile" panel shows "Show TX Filter" checked. The "Display zoom" panel shows "1x", "2x", "4x", "8x", "16x", and "32x" options, with "1x" selected. The "PowerSDR Setup by GenesisRadio" window is open, showing the "Radio Model" section with "Genesis G40" selected and a frequency of 7.046457. The "Misc Setup" section includes options for "Automatic focus", "Receive Only", "USB Si570 board", "Drag filters", "Drag spectrum", "New VFO look", "On Screen Display", "Continuous tuning", and "Button magnifier". A "Calculator" window is also open, showing the value 7.04625.

You may see an RX image on the other side of LOSC. If so, go to the calibration tab and select Stop WBIR

The image shows two windows from the PowerSDR software. The left window is the 'Calibration' tab, which includes sections for 'Level Cal' (Frequency: 10.000000, Level: -70 dBm, SMeter val: -52.435, Display val: -82.621) and 'RX Image Reject Cal' (WBIR: Stop, TX/RX Time: 2000, WBIR Fixed: unchecked, Phase: 0.00, Gain: 0.00). The right window is the main interface of 'Genesis Radio 32bit v2.0.16'. It displays three frequency readouts: VFO A (7.056 457, 40M RTTY), VFO B (7.056 457, 40M RTTY), and LOSC (7.046 457). The main display shows a spectrum plot with a signal at 7.069 981 MHz. The interface also includes various control panels for AF, RF, PWR, AGC, SQL, and Mode Specific Controls.

Adjust R2 until image is gone. Then select Start WBIR



PowerSDR Setup by GenesisRadio

General Audio Display DSP Transmit PA Settings ATU settings Appearance Keyboard Tests C / >

Hardware Config Options Calibration Filters Genesis config

Level Cal

Frequency: 10.000000

Level (dBm): -70

SMeter val: -52.435

Display val: -82.621

Start

Calibration progress

Abort

RX Image Reject Cal

Reset Save

WBIR

Stop Start

TX/RX Time: 2000

WBIR Fixed

Phase: 0.00

Gain: 0.00

Save band Reset band

Save all Reset all

Save OK Cancel Apply



Genesis Radio 32bit v2.0.16

Setup Wave Equalizer CWX Voice Messages Wizard Compact screen DX Cluster XTRV Debug About

POWER

MON TUN MOX MUT

VFO A: 7.056 457 40M RTTY

VFO B: 7.056 457 40M RTTY

LOSC: 7.046 457

Signal: -113.5 dBm

Band - HF

160	80	60
40	30	20
17	15	12
10	6	2

More WWV GEN

VFO A Mode - CW

LSB USB DSB

WFM CW FMN

AM SAM SPEC

DIGL DIGU DRM

VFO A Filter - 1.0k

1.0k	800	750
600	500	400
250	100	50
25	Var 1	Var 2

Low: 100 High: 1100

Width: Shift: Res

Display

AF: 20 RF: 21 PWR: 50 AGC: Med Med SQL: 110 SQL: 150

G40: 7.046457

CPU %: 7.4

-64.5dBm 23524.1Hz 7.069 981 MHz

Memory option: VFO A ZAP VFO Lock VFO Sinc 1 empty MR MS MC

VFO Tune Step: 500Hz 1kHz SPLIT A > B A < B A < B A < B XT 0 RIT 0

DSP VFO A: NR ANF NB NB2 BIN Panefall_inv AVG Peak

Sub RX: Sub RX Mute VAC

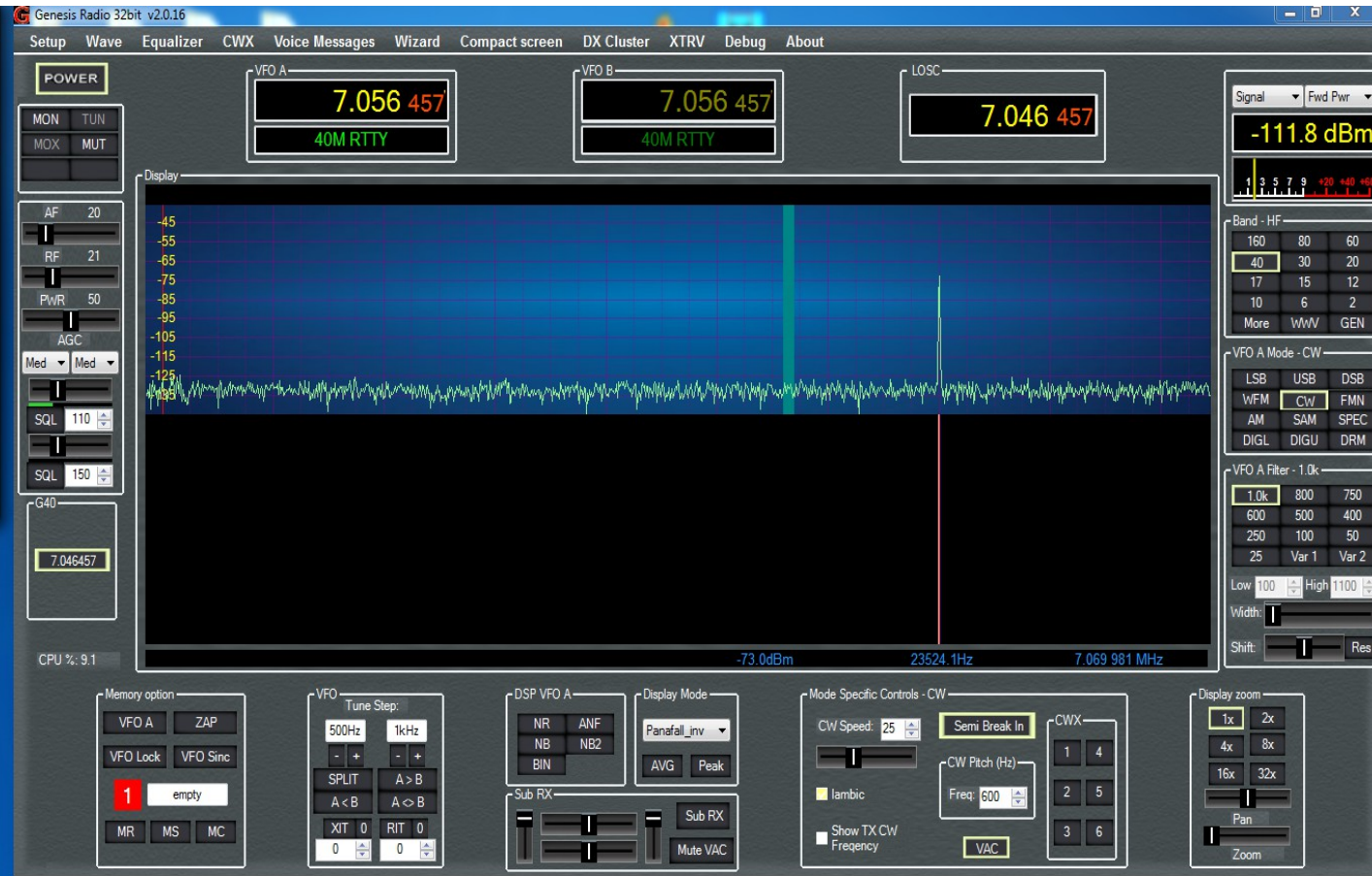
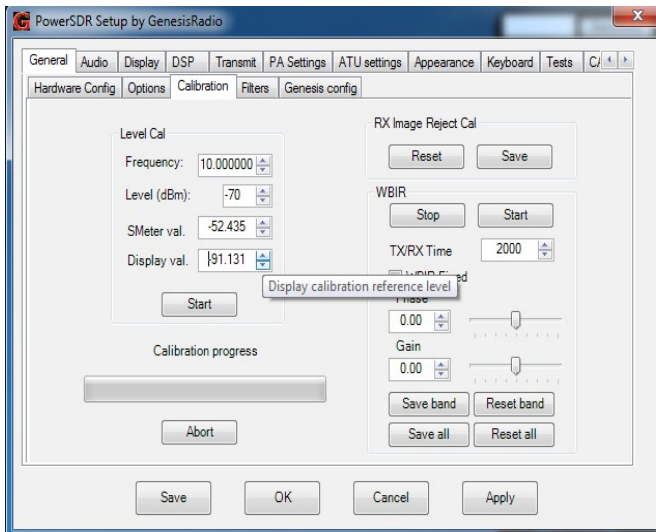
Display Mode: Panefall_inv AVG Peak

Mode Specific Controls - CW: CW Speed: 25 Semi Break In CWX: 1 4 2 5 3 6 CW Pitch (Hz): Freq: 600 VAC Show TX CW Frequency

Display zoom: 1x 2x 4x 8x 16x 32x Pan Zoom

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eHAMspotter DXwatch

Next is to calibrate the signal level
With a signal of known level. adjust Display Val arrows up
or down to set level. In the panadapter there is a reading
at the bottom of highest signal level displayed. Mine is
-73dbm



You may notice the text letters are black. Next page shows how to change that.

The image displays the PowerSDR software interface, which is used for software-defined radio (SDR) operations. The interface is divided into several sections:

- PowerSDR Setup by GenesisRadio:** A settings window with tabs for General, Audio, Display, DSP, Transmit, PA Settings, ATU settings, Appearance, Keyboard, Tests, and C/. The Display tab is active, showing options for Display Grid (Max: -25, Min: -145, Step: 10, Align: Auto), Refresh Rates (Main Display FPS: 15, Meter Delay: 100, Peak Text: 500, CPU Meter: 1000), Phase Mode (Num Pts: 100, Averaging Time: 50), Scope Mode (Time: 50, Scope color: Blue), and other parameters like Waterfall, Driver Engine (Hardware), and Multimeter settings.
- Calculator:** A standard Windows calculator window showing the number 7.04625.
- Genesis Radio 32bit v2.0.16:** The main software interface with a menu bar (Setup, Wave, Equalizer, CWX, Voice Messages, Wizard, Compact screen, DX Cluster, XTRV, Debug, About) and a toolbar. The main display area shows a spectrum plot with a vertical cursor at 7.070 000 MHz, labeled "40M RTTY". Other frequency displays show 7.092 898 MHz and 7.046 000 MHz. The signal strength is -83.1 dBm. The bottom status bar shows -67.1dBm, 32317.3Hz, and 7.078 774 MHz.
- Control Panels:** Various control panels are visible, including AF (20), RF (80), PWR (50), AGC, SQL (110, 150), and a Memory option panel with VFO A and ZAP buttons.

Go to appearance ---> Skins Tab, change text color to what ever shows up better

The image displays the PowerSDR software interface, showing the Skins tab in the Appearance settings window. The Skins tab is selected, and the Theme is set to W1AEX_ANAN. The Text color is set to a light blue/grey color. The S meter settings are also visible, with RX mode set to Signal and TX mode set to Fwd Pwr. A calculator window is open in the foreground, displaying the value 7.04625. The main radio interface shows the VFO A frequency at 7.070 000, VFO B at 7.092 898, and LOSC at 7.046 000. The waterfall display shows a signal at 7.033 720 MHz. The interface also includes various controls for AF, RF, PWR, AGC, SQL, and G40, as well as a Memory option, VFO Tune Step, DSP VFO A, Display Mode, Mode Specific Controls, and a Transmit Profile.

Now for the TX setup. Connect your serial cable and select the port it is using, mine is COM1. Connect dummy load and press TUN button. Radio should Transmit.

The screenshot displays the PowerSDR software interface during the TX setup process. On the left, the 'PowerSDR Setup by GenesisRadio' dialog box is open, showing the 'Port connection' section with 'COM1' selected. The main interface shows the following details:

- VFO A:** 7.026 500, 40M CW
- VFO B:** 7.033 757, 40M CW
- LOSC:** 7.046 457
- Signal:** -113.1 dBm
- Band - HF:** 40, 30, 20, 17, 15, 12, 10, 6, 2
- VFO A Mode - CW:** LSB, USB, DSB, WFM, CW, FMN, AM, SAM, SPEC, DIGL, DIGU, DRM
- VFO A Filter - 1.0k:** 1.0k, 800, 750, 600, 500, 400, 250, 100, 50, 25, Var 1, Var 2
- Low:** 100, High: 1100
- Width:** [Slider]
- Shift:** [Slider]
- Res:** [Slider]
- Memory option:** VFO A, ZAP, VFO Lock, VFO Sinc, 1 empty, MR, MS, MC
- VFO Tune Step:** 500Hz, 1kHz, SPLIT, A > B, A < B, XIT 0, RIT 0, 0, 0
- DSP VFO A:** NR, ANF, NB, NB2, BIN, Panafall Inv, AVG, Peak
- Sub RX:** Sub RX, Mute VAC
- Mode Specific Controls - CW:** CW Speed: 25, Semi Break In, CWX: 1 4, 2 5, 3 6, CW Pitch (Hz): 600, VAC, Show TX CW Frequency
- Display zoom:** 1x, 2x, 4x, 8x, 16x, 32x, Pan, Zoom

Now we need to set the Sound card Output voltage level. With a volt meter set to AC scale, connect to tip and sleeve of cable coming from sound card output. Press TEST button and you should see a voltage reading. Then click Abort on small window that popped up.

The screenshot displays the PowerSDR software interface with several windows open. The main window shows the 'Setup' menu and various controls for VFO A (7.026 500), VFO B (7.033 757), and LOSC (7.046 457). A 'POWER' meter shows -111.7 dBm. The 'Audio Output Voltage' is set to 1.00, and a 'Test' button is visible. A 'Calibrate Sound Card' dialog box is open, showing a voltage reading of 7.046457. The 'Audio Setup' window shows the 'Audio Output Voltage' set to 1.00 and the 'Test' button. The 'Calibrate Sound Card' dialog box is open, showing a voltage reading of 7.046457. The 'Audio Setup' window shows the 'Audio Output Voltage' set to 1.00 and the 'Test' button. The 'Calibrate Sound Card' dialog box is open, showing a voltage reading of 7.046457.

Another small window pops up, click OK. Then enter the voltage reading into Audio Output Voltage. Sound card is now calibrated

The screenshot displays the PowerSDR interface with several windows open. The main window shows the 'POWER' section with VFO A at 7.026 500 and VFO B at 7.033 757. The 'Display' section shows a spectrum plot with a signal at 7.046 457. The 'Audio Output Voltage' is set to 1.00. A 'Sound Card Calibration complete.' dialog box is visible in the bottom left. The 'PowerSDR Setup by GenesisRadio' window is open, showing the 'Audio' tab with various settings for the sound card.

PowerSDR Setup by GenesisRadio - Audio Tab

Sound Card: VAC Digital VAC

Primary Sound Card Setup Details

Model: Unsupported Card
Driver: ASIO
Input: Xonar Essence ST ASIO
Output: Xonar Essence ST ASIO
Mixer: [Empty]
Receive: [Empty]
Transmit: [Empty]

Buffer Size: 1024
Sample Rate: 96000
Line In Gain: 20
Mic Gain: 50
Mic Boost: [Off]

Channels: 2
RX: 1/2 In
TX: 1/2 Out

Audio Output Voltage: 1.00 [Test]

Direct I/Q output: [Off]
Phase: 0.00
Gain: 0.00
Latency (ms): 120

Enable VAC as Mic/Speaker device [Off]
Line/Mic shared input [Off]
RX swap I/Q [Off]
TX swap I/Q [Off]

Sound Card Calibration complete.

PowerSDR Main Window

POWER: VFO A 7.026 500, VFO B 7.033 757, LOSC 7.046 457

MON TUN, MOX MUT, AF 20, RF 21, PWR 50, AGC Med, SQL 110, SQL 150

Display: -45 to -135 dBm, -106.8dBm, -45.3Hz, 7.046 412 MHz

CPU %: 9.0

VFO Tune Step: 500Hz, 1kHz

DSP VFO A: NR, ANF, NB, NB2, BIN, Panafal Inv, AVG, Peak

Mode Specific Controls - CW: CW Speed 25, Semi Break In, CW Pitch (Hz) 600, Freq 600, VAC

Display zoom: 1x, 2x, 4x, 8x, 16x, 32x, Pan, Zoom

New Voltage entered

PowerSDR Setup by GenesisRadio

General Audio Display DSP Transmit PA Settings ATU settings Appearance Keyboard Tests

Sound Card VAC Digital VAC

Primary Sound Card Setup Details

Model: Unsupported Card

Driver: ASIO

Input: Xonar Essence ST ASIO

Output: Xonar Essence ST ASIO

Mixer: []

Receive: []

Transmit: []

Buffer Size: 1024

Sample Rate: 96000

Line In Gain: 20

Mic Gain: 50

Mic Boost: [] On

Audio Output Voltage: 2.08

Channels: 2

RX: 1/2 In

TX: 1/2 Out

3/4 In

3/4 Out

Exl. access: []

IQ correction: 0

Direct I/Q output: [] Enable

Phase: 0.00

Latency (ms): 120

Manual: []

Gain: 0.00

RX shift enable: []

RX shift: 24000

Gain: 0.00

QSK: [] On

Enable VAC as Mic/Speaker device: []

Line/Mic shared input: []

RX swap I/Q: []

TX swap I/Q: []

Save OK Cancel Apply

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Genesis radio s2bit v2.0.10

Setup Wave Equalizer CWX Voice Messages Wizard Compact screen DX Cluster XTRV Debug About

POWER

VFO A: 7.026 500
40M CW

VFO B: 7.033 757
40M CW

LOSC: 7.046 457

MON TUN
MOX MUT

AF 20
RF 21
PwR 50
AGC
Med Med
SQL 110
SQL 150

G40
7.046457

CPU %: 10.0

Display

-45
-55
-65
-75
-85
-95
-105
-115
-125
-135

-117.8dBm

-17178.5Hz

7.029 279 MHz

Band - HF

160	80	60
40	30	20
17	15	12
10	6	2

More WWV GEN

VFO A Mode - CW

LSB USB DSB

WFM CW FMN

AM SAM SPEC

DIGL DIGU DRM

VFO A Filter - 1.0k

1.0k	800	750
600	500	400
250	100	50
25	Var 1	Var 2

Low 100 High 1100

Width: []

Shift: [] Res

Memory option

VFO A ZAP

VFO Lock VFO Sinc

1 empty

MR MS MC

VFO Tune Step

500Hz 1kHz

SPLIT A > B

A < B A < B

XIT 0 RIT 0

DSP VFO A

NR ANF

NB NB2

BIN

Display Mode

Panafall Inv

AVG Peak

Sub RX

Sub RX

Mute VAC

Mode Specific Controls - CW

CW Speed: 25

Semi Break In

CW Pitch (Hz)

Freq: 600

VAC

Display zoom

1x 2x

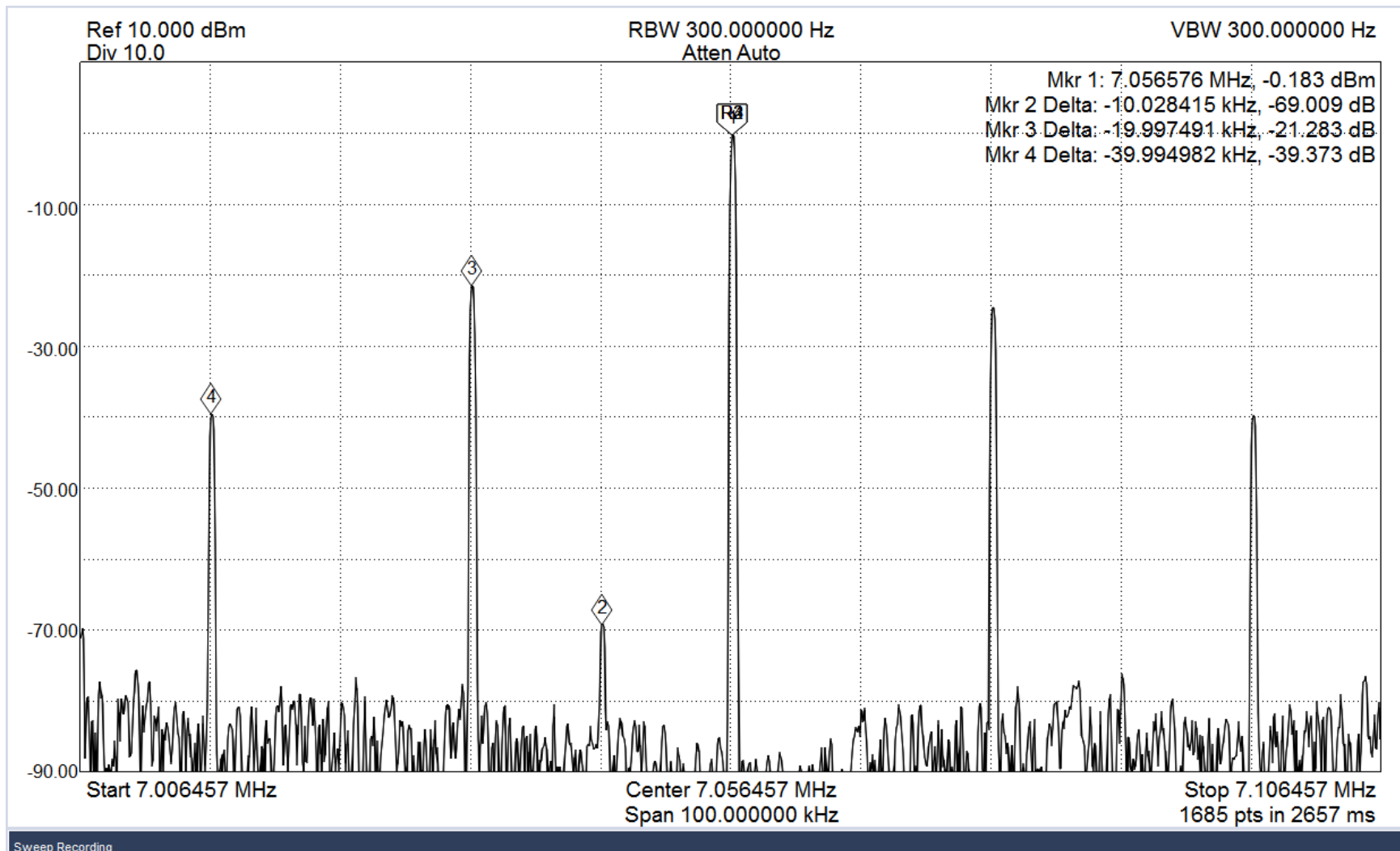
4x 8x

16x 32x

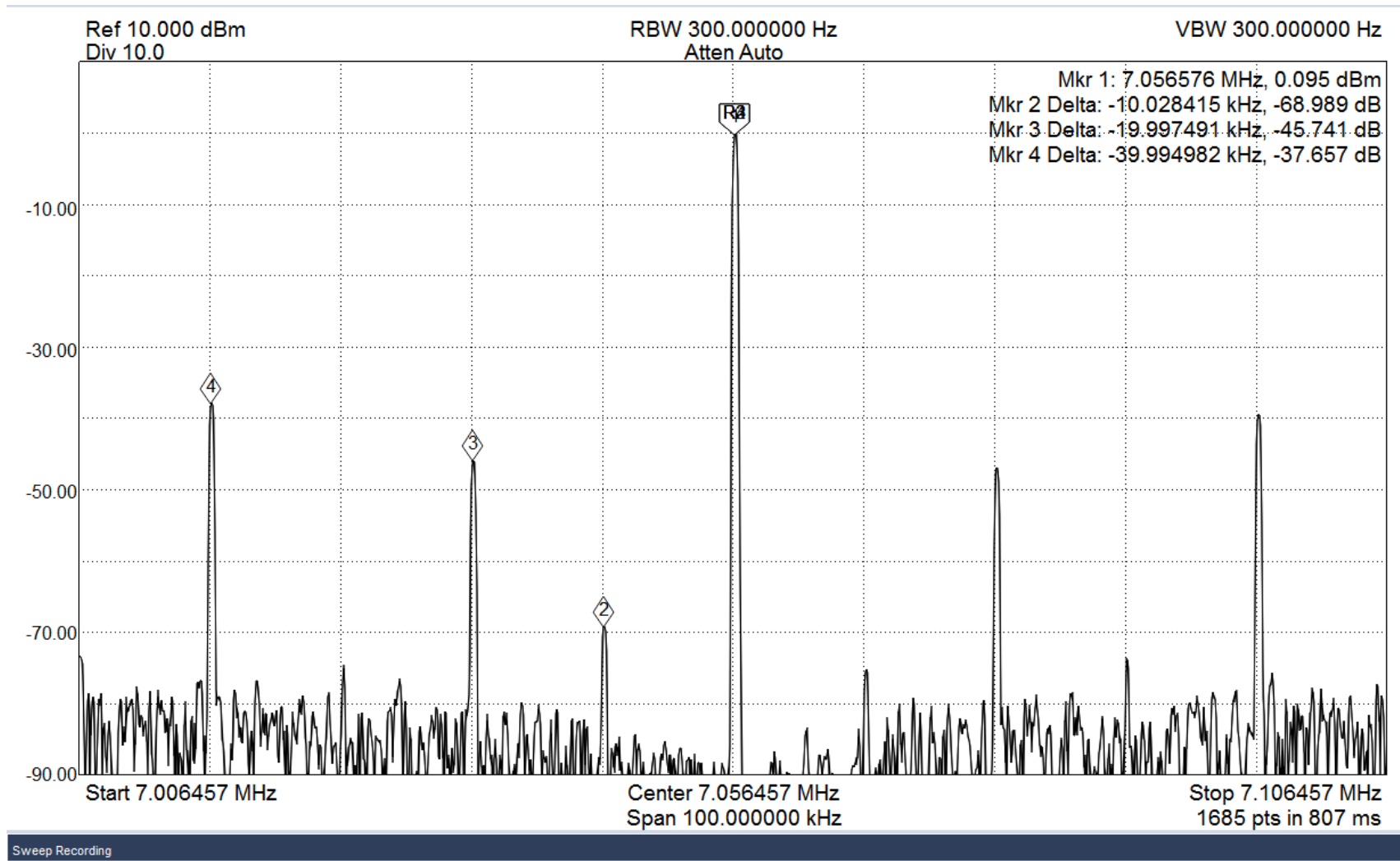
Pan

Zoom

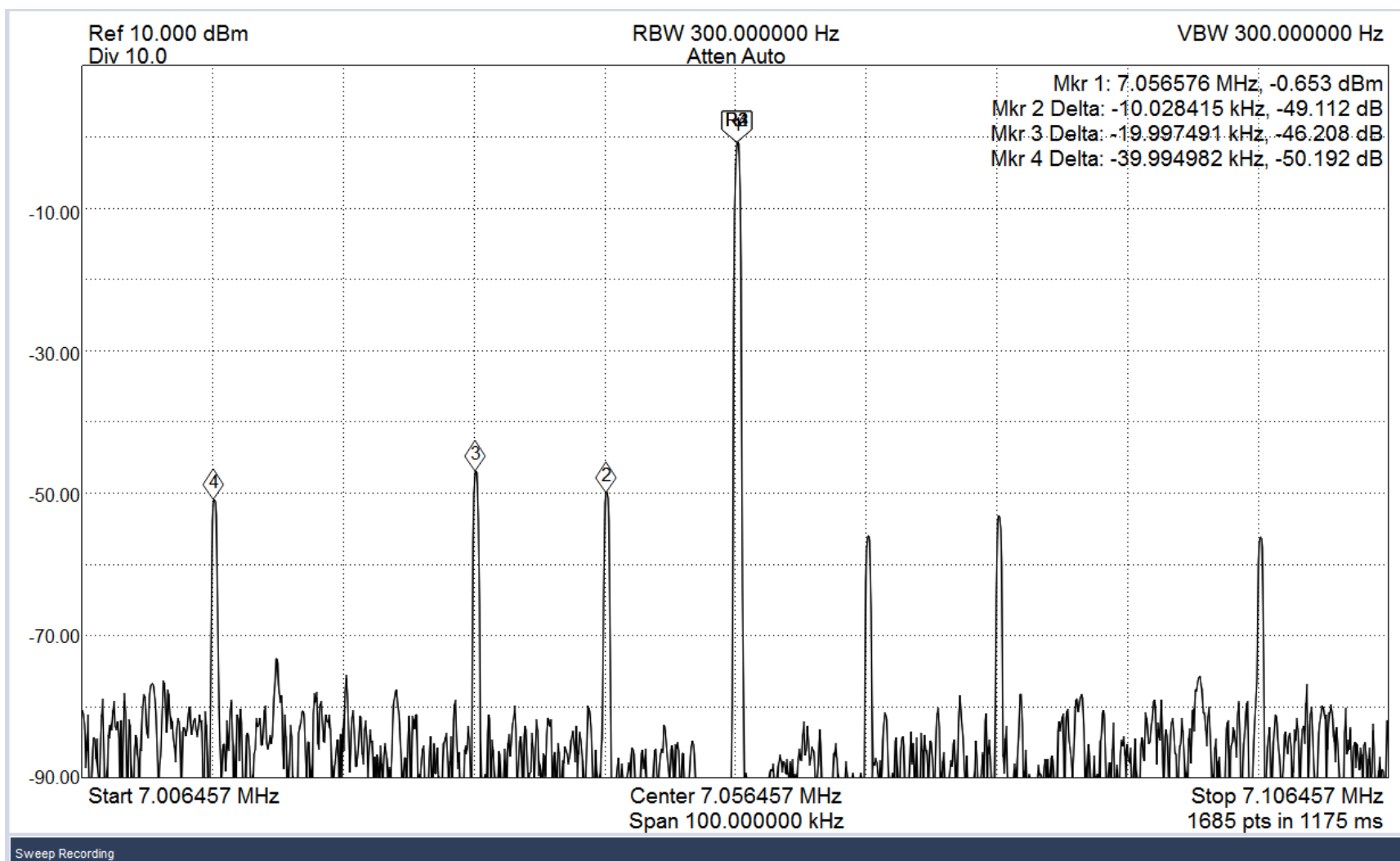
First thing we are going to do is adjust the trimmers, R9 and R10 back and forth until we get the LO(2) reduced as far as we can go while transmitting into a dummy load. Make sure you monitor the PA heat sink! Let cool between adjustments as necessary!



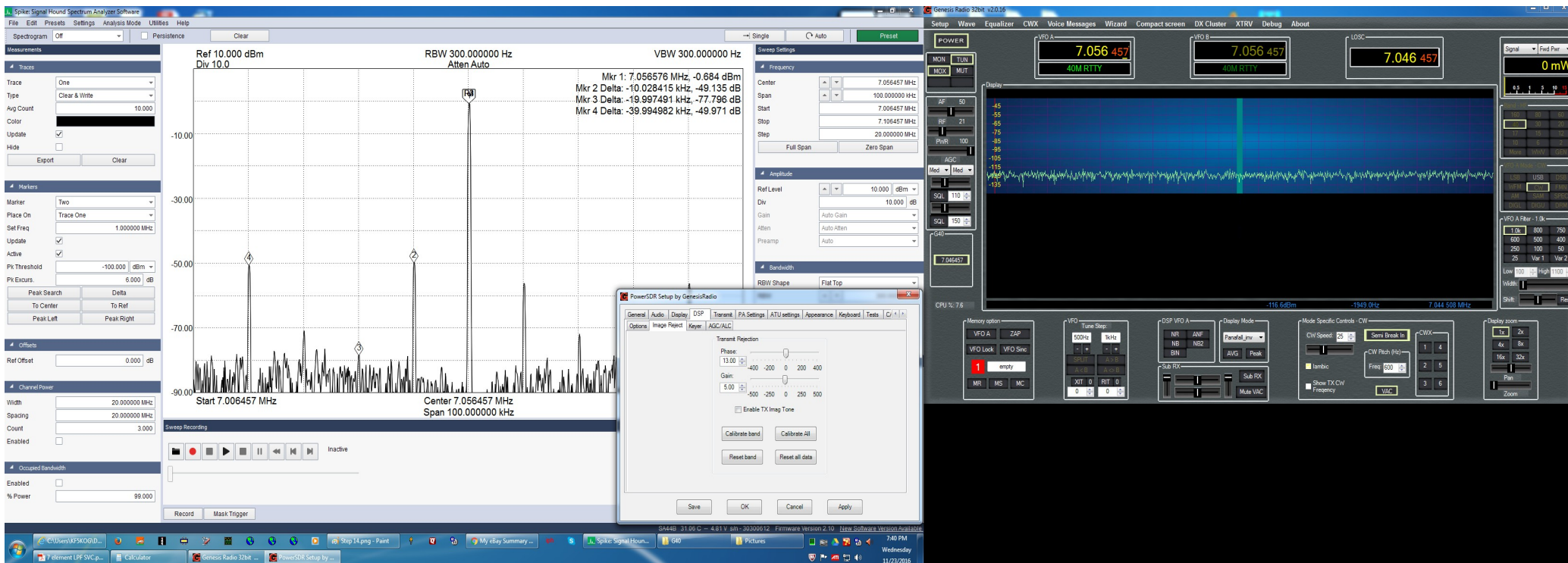
Now adjust the TX image(3) with Trimmer R67 for lowest level. This is only half the adjustment. Software is next.



You may have to go back and adjust the LO signal again.
Everything seems to interact with each other. LO, TX
and RX image adjustments.



Now the software TX image adjustments. Adjust sliders Phase and Gain until you get image(3) as low as possible. Click Save.



Now adjust drive level until the 4th signal is within limits. Initially my power output was 7 watts now it is 6 watts. Do not try to over drive this radio! A tip I learned if using another RX radio. Set the transmitted signal to show S9 on the meter. If all 4 of the signals in question don't show a needle deflection you are good to go!

