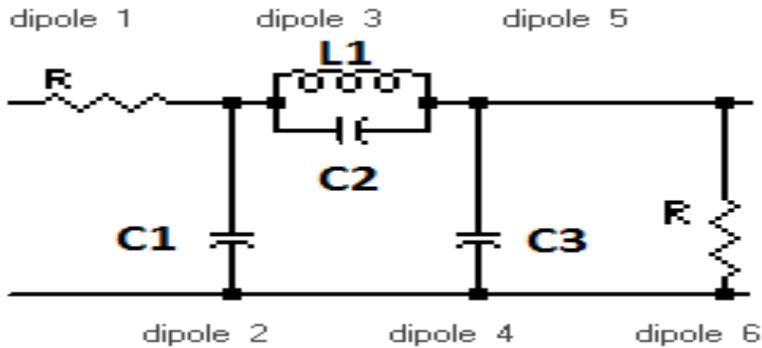


Avala-01 Mixer Low Pass Filter



Band	C1, C3	C2	L1	Measured Inductance Using AADE Meter	L1 Turns on T25 Toroid
160M	2800pF	160pF	3.3uH	3.5uH	32 Turns #32 wire
80M	820pF	150pF	1.4uH	1.8uH	22 Turns #32 wire
60M	820pF	100pF	1.2uH	1.28uH	19 Turns #28 wire
40M	820pF	68pF	.83uH	.82uH	15 Turns #28 wire
30M	560pF	68pF	.57uH	.57uH	14 Turns #28 wire
20M	330pF	56pF	.4uH	.44uH	12 Turns #28 wire
17M	300pF	22pF	.34uH	.37uH	11 Turns #28 wire
15M	180pF	22pF	.32uH	.36uH	11 Turns #28 wire
12M	180pF	22pF	.27uH	.26uH	9 Turns #28 wire
10M	180pF	22pF	.2uH	.21uH	8 Turns #28 wire

T25-2
T25-6
Tested

Revisions

Contents

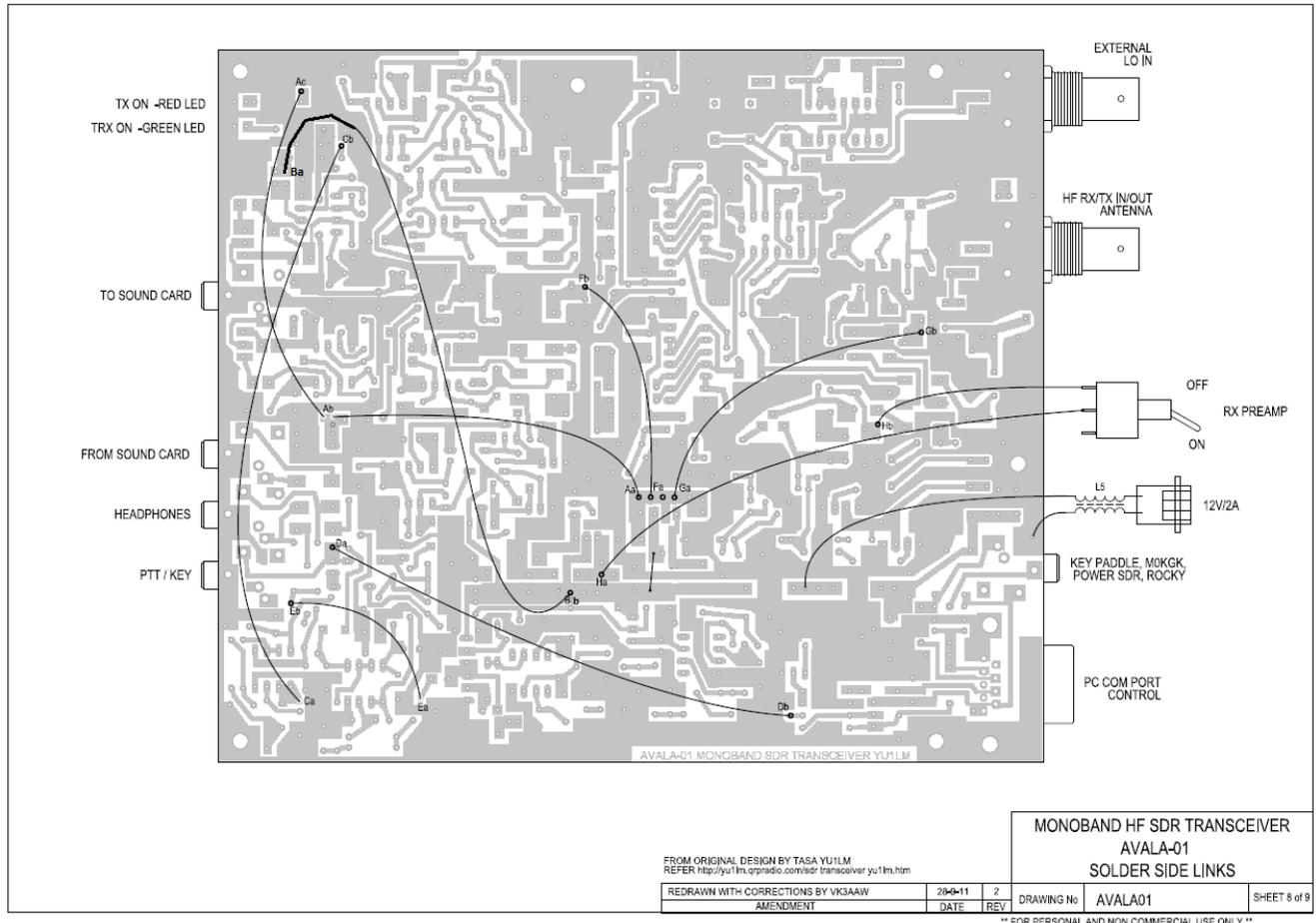
1. Tools
2. Overview of connections
3. Hardware Setup
4. Software Setup
 1. GSDR

Chapter 1

1. Multimeter
2. Signal generator or another radio capable of transmit on desired frequency

Chapter 2

First lets make sure the Avala-01 interconnect wires are connected correctly. Look at the picture below.

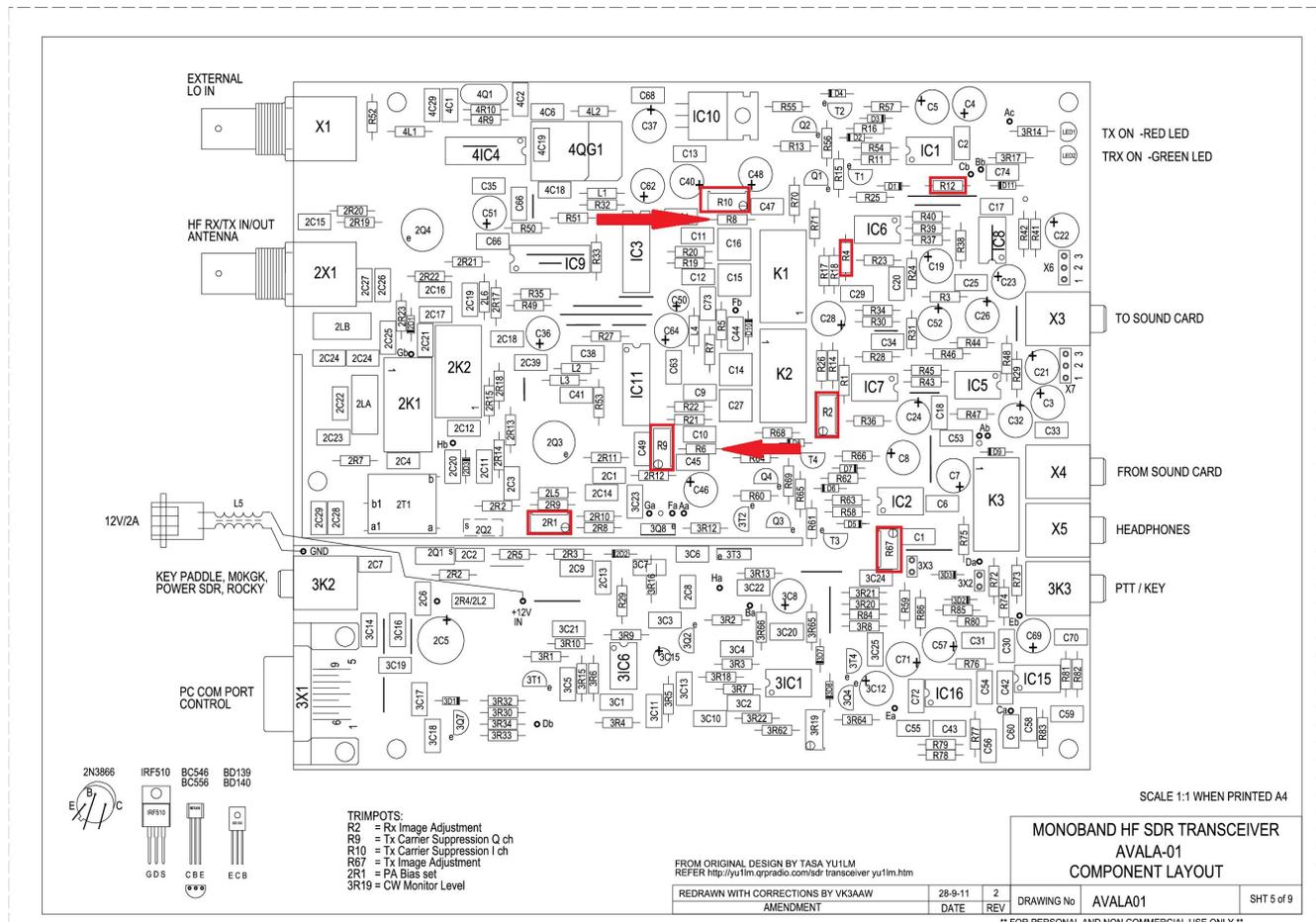


Connect sound card input to X3(to sound card). Place jumpers on X6(pins 1,2) and X7(pins2,3). This is the lower of the two settings for a +23db gain.

Connect serial cable to 3X1 port(DB9 connector)

Chapter 3

The next steps I take are to preset some of the trimmers. Look at picture below.



Measure across R4 with ohm meter and record reading. Then measure between pins 2 and 7 of IC7. Adjust R2 trimmer to match reading from R4.

Measure resistance across R12 and record reading. Then measure from pin1 on IC16 to pin 2 of IC2. Adjust trimmer R67 to match reading on R12.

Connect 12-13.8V power to Avala-01.

Now we need to adjust R9 and R10 to be close to equal voltage. Measure volts at each arrow in picture and adjust R9 and R10 to make them equal. You will need to go back and forth because one affects the other. Volts should be between 2.4-2.5V.

Lets jump to Software setup so we can test the receiver function.

Chapter 4

For RX testing we have several options of software that I have tested.

HPSDR
SDR Sharpe
GSDR
Power SDR V2.4.4

I will Start with GSDR because it is the only one that is capable of transmission when using a mono band Avala-01

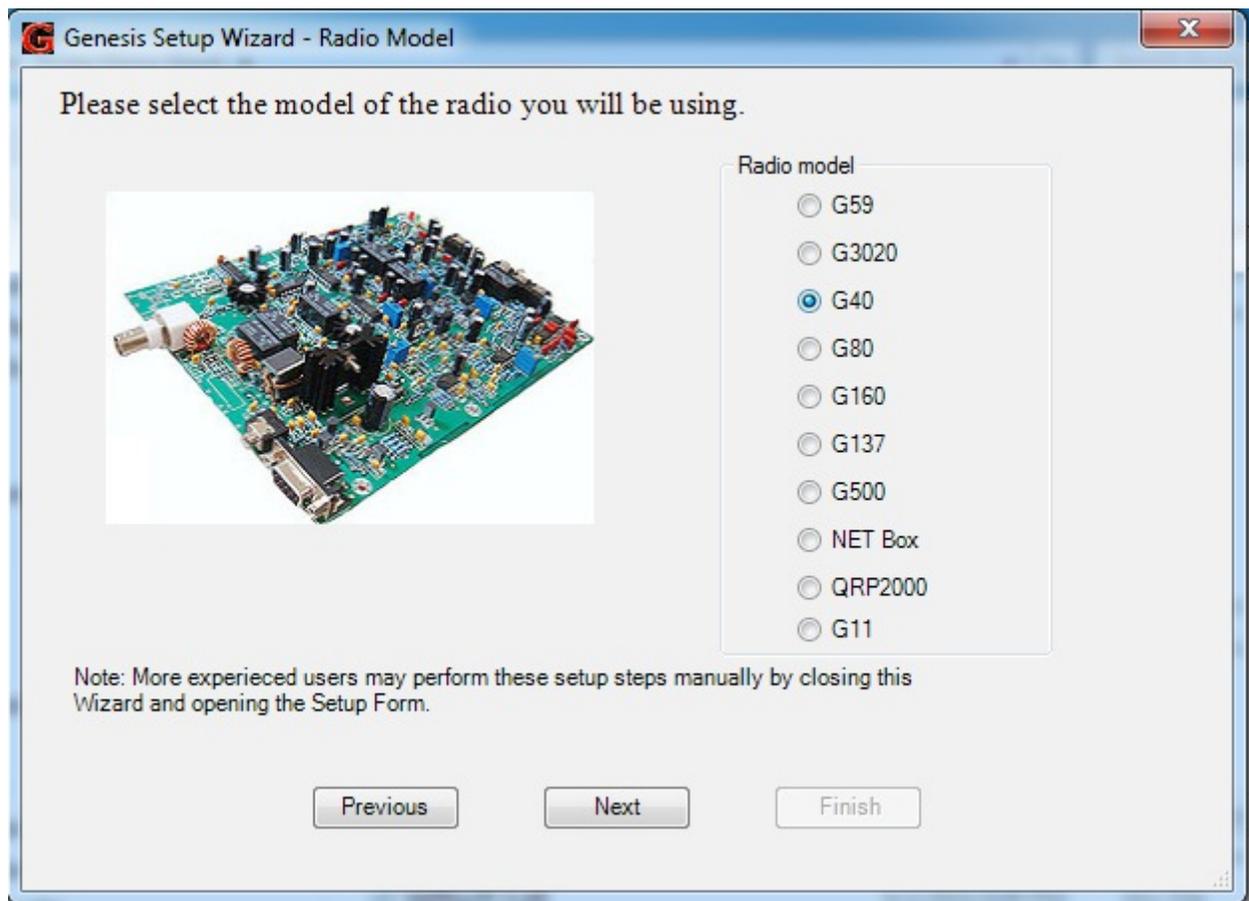
Go here [GSDR Down load](#) and download the file GSDR install.zip. Extract this to your computer. Then download the latest update. Currently it is GSDR update 21022014 and extract to computer. Now we have two folders. Open the update folder and copy all the files and then paste into the install folder. When prompted choose overwrite files. This will update the program. When new updates do come out, it is the same process.

After you have the Avala-01 all setup I would copy the database.xml file to another location just in case the program gets corrupted. This will have all of your configuration settings and Image rejection adjustments.

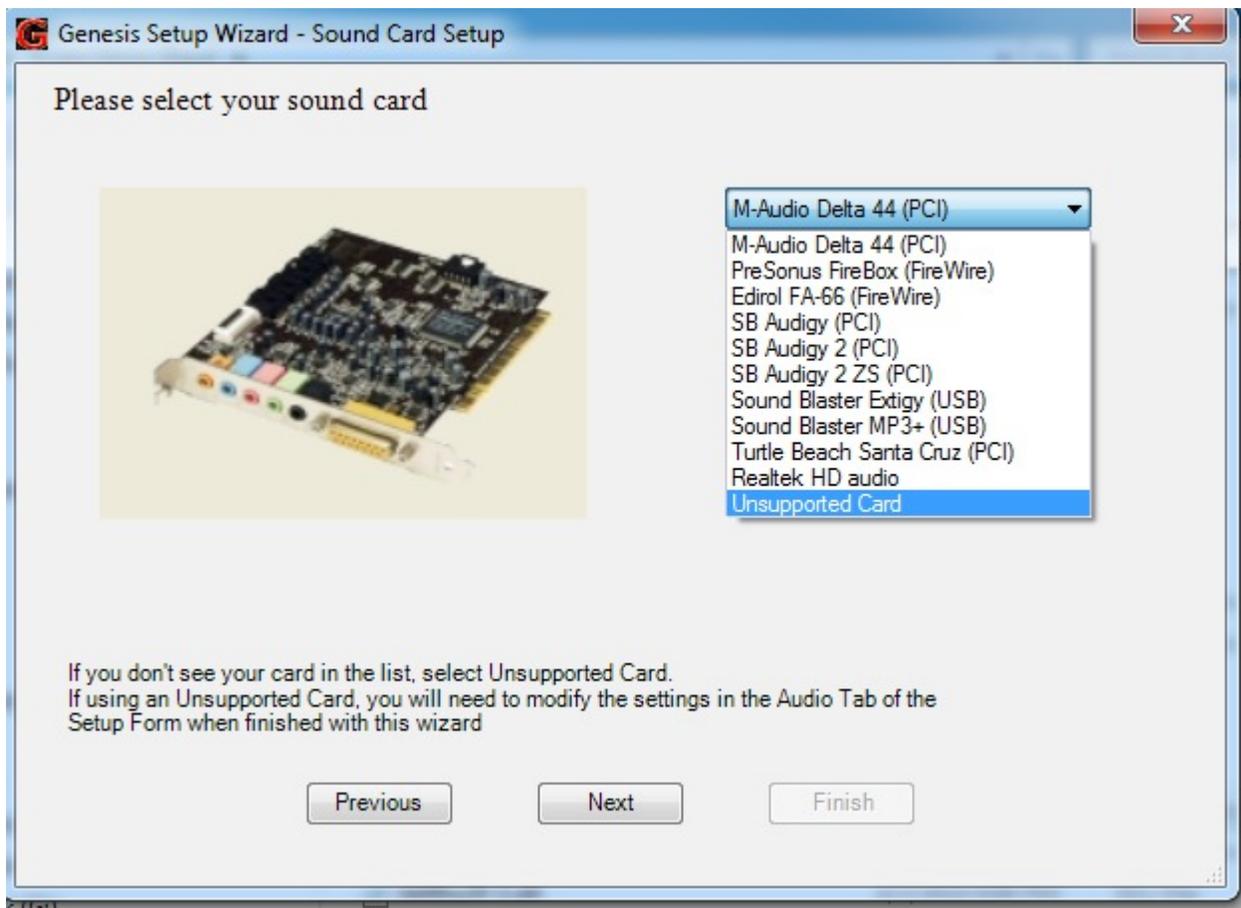
Now double click on Genesis.exe. Don't use GenesisDX.exe.

The first window will be a DOS windows to check FFT speeds. Just click OK and let it run.

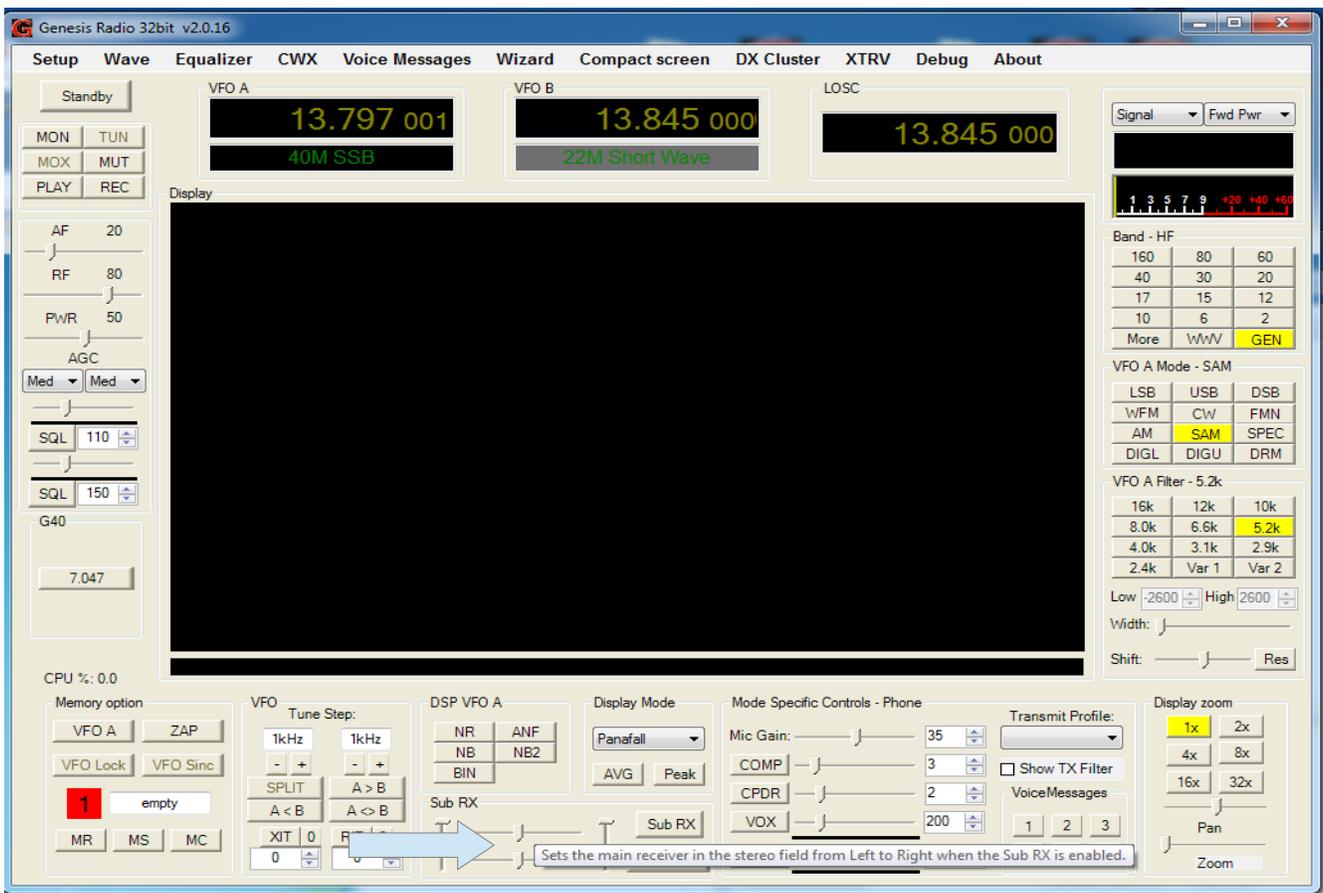
This will be the next window. Select G40



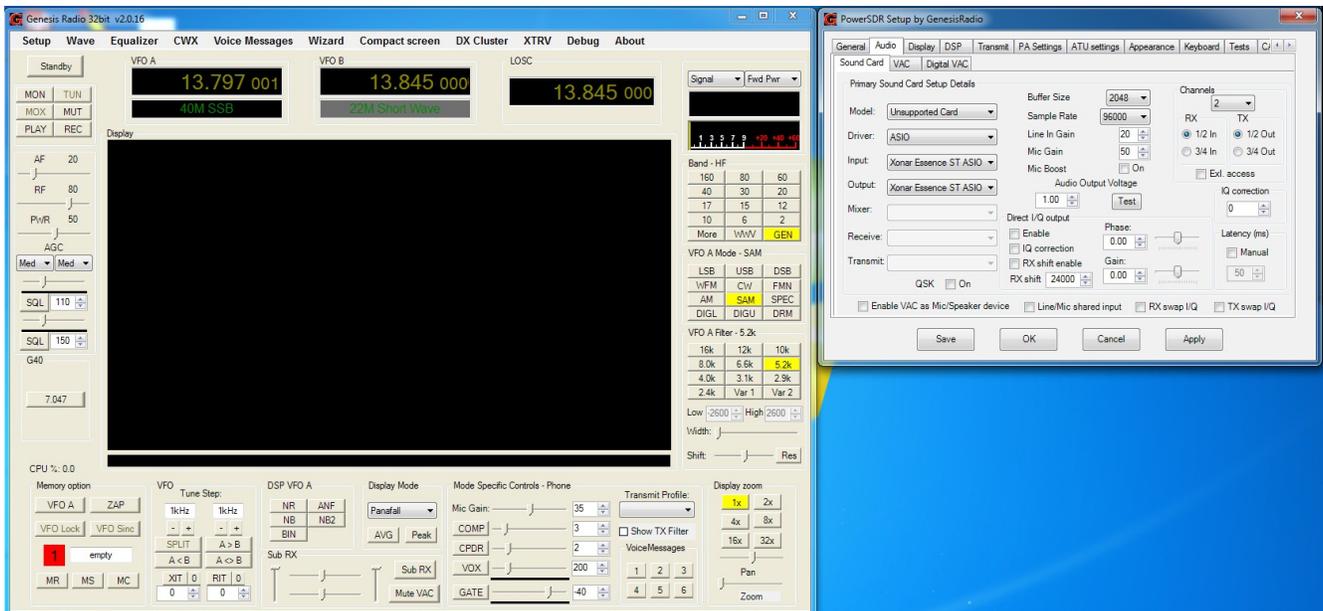
Click Next.



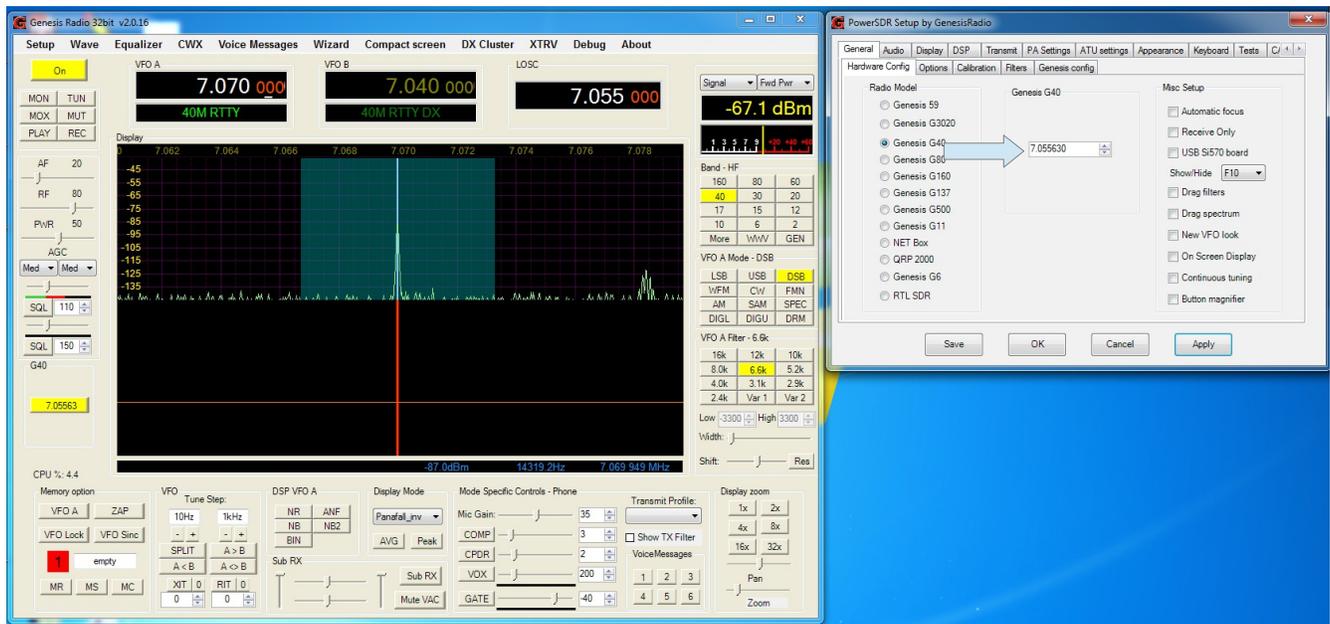
Unless you have one of these legacy sound cards, select “Unsupported Card”



Note the Arrow. Make sure both horizontal sliders are in the middle.



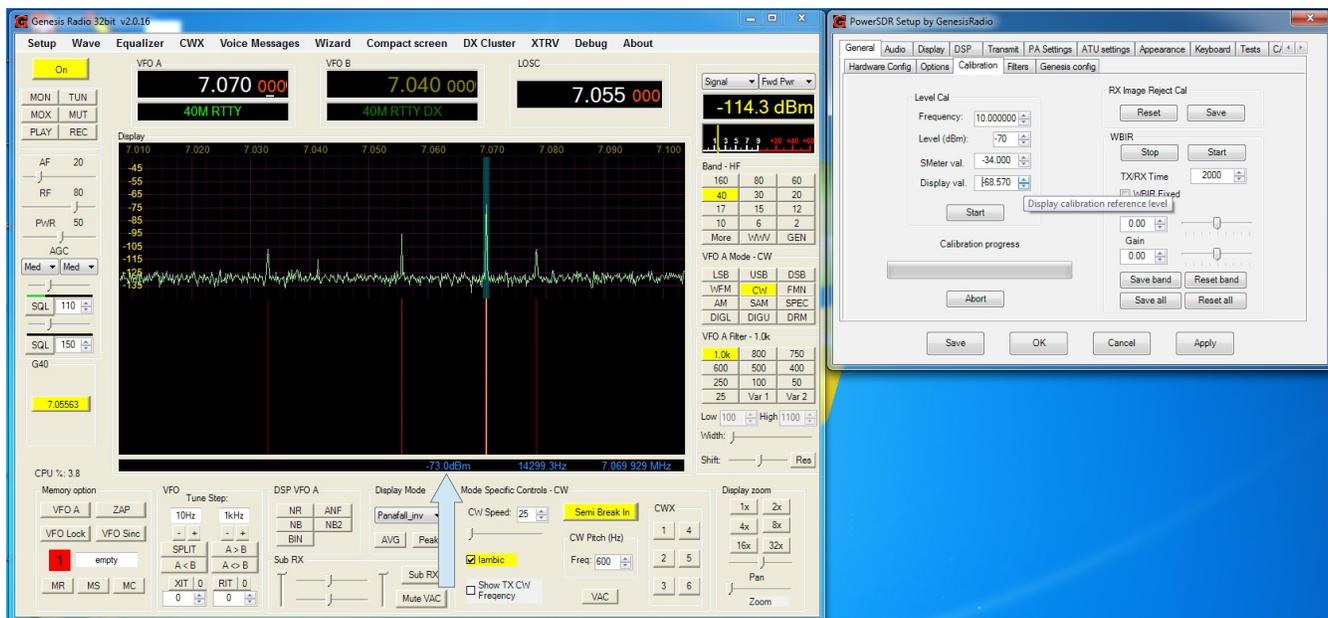
Sound card setup. Select Setting on upper left of main window and then select Audio->sound card Tab. This will look different depending your sound card. Basically select the driver and your sound card for input and output. Set sample rate and buffer. Leave the rest at default for now.



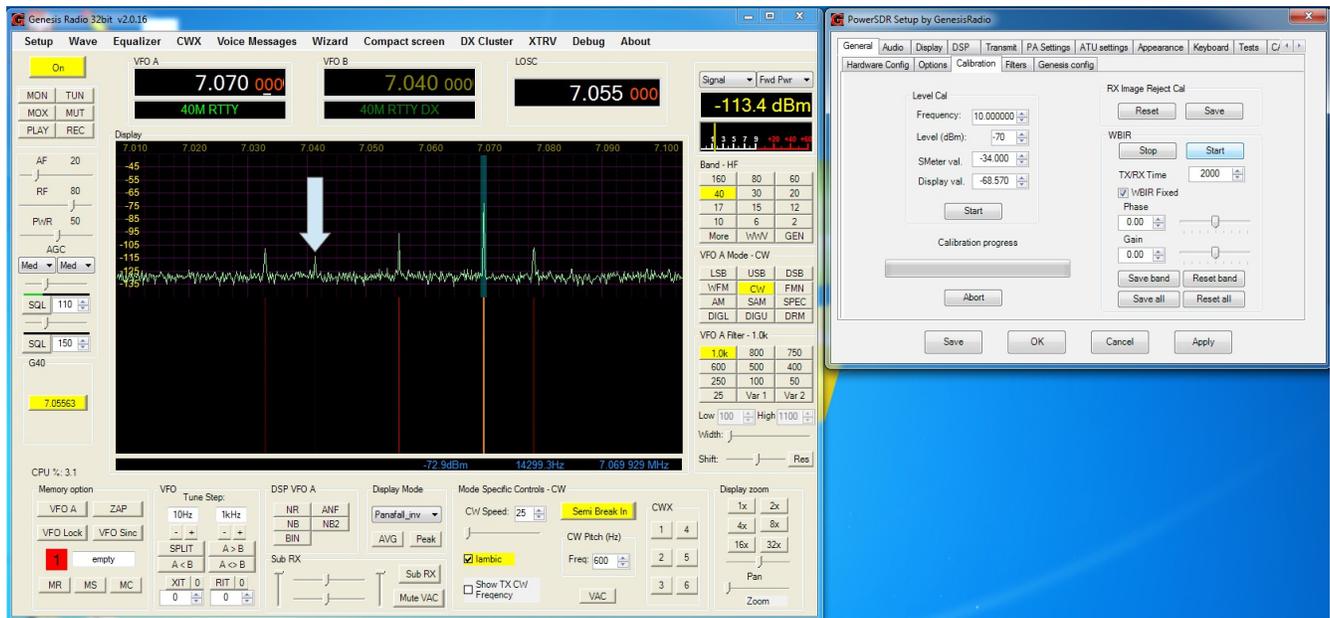
We should now be able to select the power button on upper left, It will change to on and we should see some noise in the display. The level is not calibrated yet so the noise floor may be higher or lower that what you see here.

We need to calibrate the frequency now. First note the arrow. Take your crystal frequency and divide by 4 and enter that into the block. This should be close enough for now.

Now we need a signal source. Using your known signal source, which should be viewable in panadapter. Adjust the crystal frequency up or down in the block to bring the signal to center. I Normally use VFO A mode DSB for this because it has a line in the center. I will also zoom in a little for better resolution. Your signal should look like mine when done. Click Apply.



Level calibration is next. The automatic function does not work with crystal radio. Note the Arrow. This will show the highest signal in the display which should be your signal. If you have a calibrated signal then you need to adjust Display val. Until the signal level is correct. To make it go quicker because the up and down arrows will take a very long time. You can manually enter numbers. I would go up or down by 10 until I get close, then adjust the arrows to get it spot on. Typically the noise floor into dummy load should be -115 to -125 db. If you do not have a calibrated signal level then adjust the noise floor to this level is fine. My sound card is one of the higher end models.

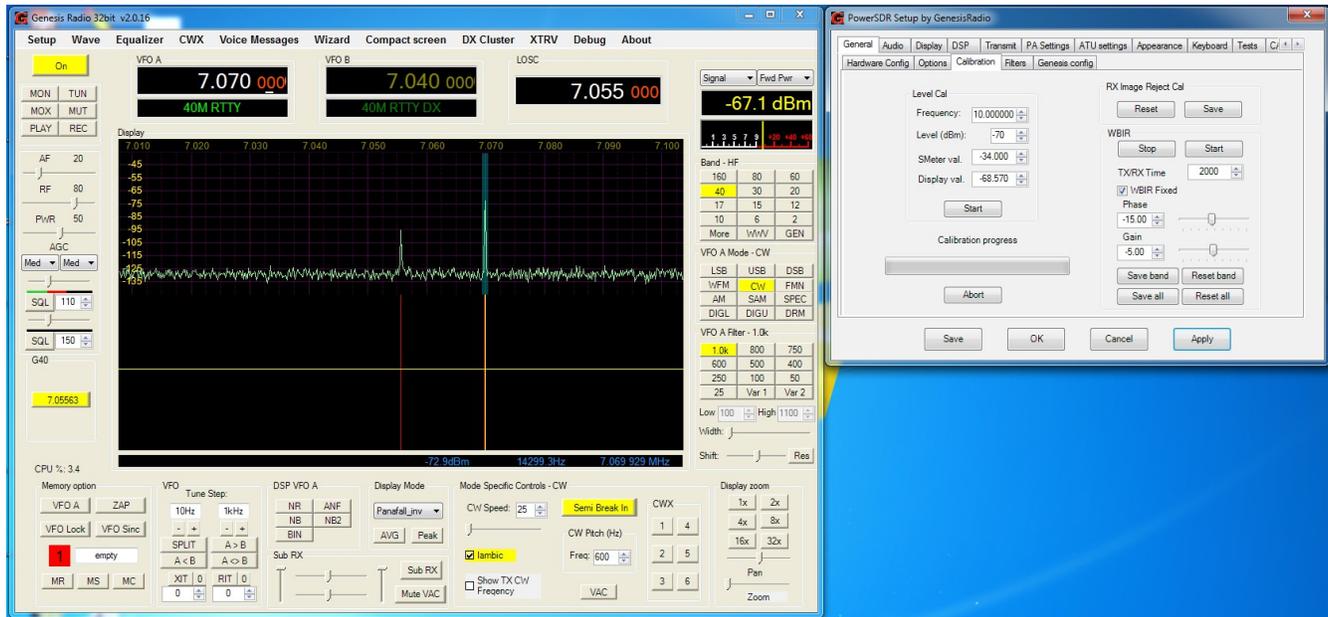


Next is Receive image rejection adjustment. Note the arrow. This is my image. The other 2 images are my florescent lights. On the Calibration TAB select STOP WBIR. First we will adjust R2 on the Avala-01 for the lowest image. You should be able to make image move up and down by turning the trimmer. If your image is the same level as your signal then there is a problem in the audio chain.

I have not had much luck using the automatic WBIR. I normally use Manual. You can try it if you like. Select Start and then reset, now watch the image. When it gets low enough for you, select save button next to reset button.

To manually adjust image select start as before but also check WBIR Fixed. Then adjust sliders to get lowest image. Select save band.

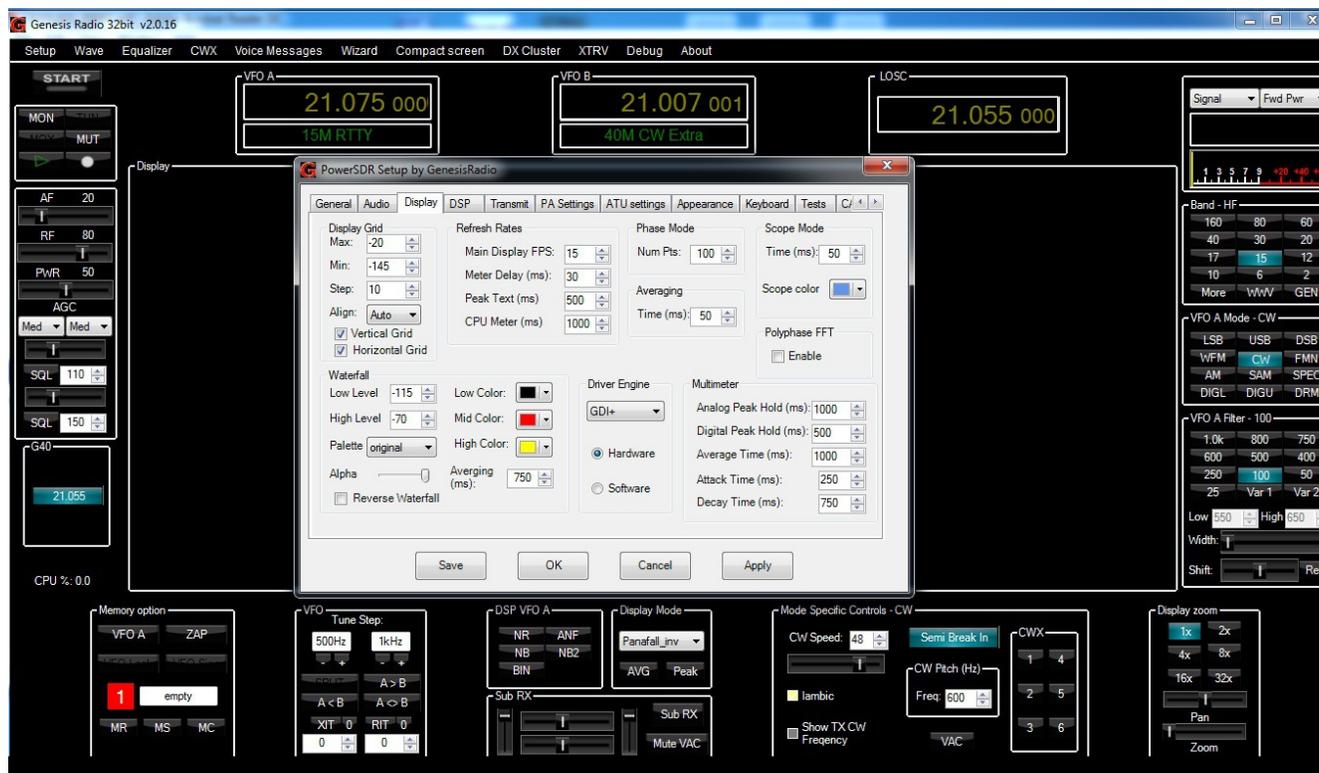
It should look like this(with my florescent lights off)



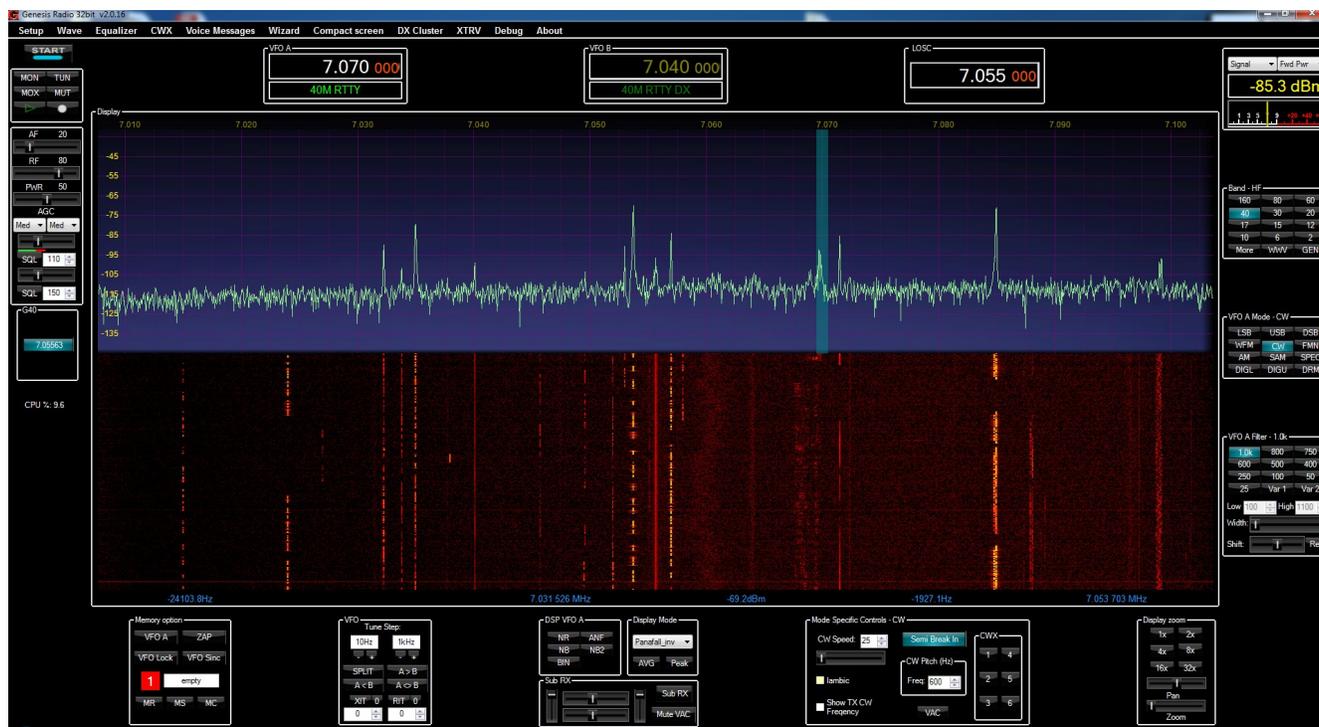
To change the look of GSDR, go to Appearance--->skins tab. Chose one of the skins. You also need to change console color to black and text to white. Looks like this now.



To change the way the signal looks on panadapter you can adjust display grid Max level and Low Level. Low level should be set close to your noise floor. That way the waterfall won't be all red with the noise.



Now connect antenna and enjoy viewing some signals!



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 7.069981 MHz. The signal level is -72.9 dBm, and the bandwidth is 23524.1 Hz. The VFO A and VFO B frequencies are both set to 7.056457 MHz, and the LOSC frequency is 7.046457 MHz. The signal strength is -110.7 dBm.

The interface includes several control panels:

- POWER:** MON, TUN, MOX, MUT.
- AF:** 20
- RF:** 21
- PwR:** 50
- AGC:** Med, Med
- SQL:** 110, 150
- G40:** 7.046457
- CPU %:** 8.1
- 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, 0, 0.
- DSP VFO A:** NR, ANF, NB, NB2, BIN, Sub RX, Mute VAC.
- Display Mode:** Panafall_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.

The spectrum display shows a signal at 7.069981 MHz with a bandwidth of 23524.1 Hz and a signal level of -72.9 dBm. The VFO A and VFO B frequencies are both 7.056457 MHz, and the LOSC frequency is 7.046457 MHz. The signal strength is -110.7 dBm.

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 key components highlighted:

- PowerSDR Setup by GenesisRadio:** The "Radio Model" section is set to "Genesis G40" with a frequency of 7.045000. The "Misc Setup" section includes options like "Automatic focus", "Receive Only", and "USB Si570 board".
- Calculator:** A Windows calculator window is open, showing the result of a calculation: 7.04625.
- PowerSDR Main Interface:** The "POWER" section shows VFO A at 7.058 649 (40M RTTY) and VFO B at 7.094 999 (40M RTTY). The "Display" section shows a spectrum plot with a signal at 7.070 524 MHz. The "Signal" strength is -112.6 dBm.
- Hardware Config:** The "Hardware Config" section shows the "Radio Model" set to "Genesis G40" and the "Misc Setup" section with various options.

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 the following details:

- VFO A:** Tuned to 7.070 000 MHz with 40M RTTY mode.
- VFO B:** Tuned to 7.094 999 MHz with 40M RTTY mode.
- LOSC:** Tuned to 7.047 000 MHz.
- Signal Strength:** -63.9 dBm.
- Band - HF:** 160, 80, 60, 40, 30, 20, 17, 15, 12, 10, 6, 2 MHz.
- VFO A Mode:** DSB.
- VFO A Filter:** 6.0k.
- Display:** A waterfall plot showing a signal at 7.070 MHz. The frequency scale ranges from -28328.6Hz to 7.070 524 MHz.
- Mode Specific Controls - Phone:** Includes Mic Gain (35), COMP (3), CPDR (2), VOX (200), and GATE (-40).
- Display Mode:** Panafall_inv.
- Sub RX:** Includes Sub RX and Mute VAC controls.

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 interface is divided into several sections:

- PowerSDR Setup by GenesisRadio:** A configuration window on the left side, showing various settings for the radio model (Genesis G40) and misc setup options like automatic focus, receive only, and USB Si570 board.
- Calculator:** A standard Windows calculator window is open, showing the frequency value 7.04625.
- Genesis Radio 32bit v2.0.16:** The main software interface, featuring a central spectrum display (VFO A and VFO B) showing signal strength and frequency. The VFO A frequency is 7.070 000 and VFO B is 7.092 898. The signal strength is -63.9 dBm.
- Control Panels:** Various control panels are visible, including the AF (Audio Filter) panel, PWR (Power) panel, SQL (Signal Level) panel, and DSP VFO A panel.
- Mode Specific Controls - Phone:** A panel on the right side showing settings for microphone gain, compression, and other phone mode parameters.

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

The screenshot displays the PowerSDR software interface during a frequency calibration process. On the left, the 'PowerSDR Setup by GenesisRadio' window is open, showing the 'Radio Model' section with 'Genesis G40' selected and a frequency of 7.046457. Below it, a Windows 'Calculator' window shows the value 7.04625. The main interface shows the 'Setup' window with 'VFO A' at 7.070 000 and 'VFO B' at 7.092 898. The 'Display' window shows a spectrum plot with a signal centered at 7.069 986 MHz. The 'Signal' strength is -63.9 dBm. The 'Display zoom' is set to 1x. The 'Tune Step' is 500Hz. The 'Mode Specific Controls' are visible at the bottom right.

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/Start buttons, TX/RX Time: 2000, WBIR Fixed checkbox, Phase: 0.00, Gain: 0.00). The right window is the main interface of 'Genesis Radio 32bit v2.0.16'. It features three frequency displays: 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 and a level of -65.3 dBm. The interface also includes various control panels for AF, RF, PWR, AGC, SQL, and Mode Specific Controls (CW Speed: 25, CW Pitch: 600 Hz).

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

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

Calibration progress

Abort

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

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

<http://www.n0n0h.com>
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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

The image shows two windows from the PowerSDR software. The left window is the 'Level Cal' dialog box, which is used to calibrate the signal level. It has several input fields: Frequency (10.000000), Level (dBm) (-70), SMeter val. (-52.435), and Display val. (91.131). There are also buttons for 'Start', 'Stop', 'Save', and 'Reset'. A tooltip 'Display calibration reference level' is visible over the 'Display val.' field. The right window is the main PowerSDR interface, showing a signal display with a frequency of 7.056 457 MHz and a signal level of -111.8 dBm. The signal display also shows a reading of -73.0dBm at the bottom. The interface includes various controls for VFO A, VFO B, and LOSC, as well as a spectrum display and various settings panels.

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 Waterfall (Low Level: 105, High Level: -70, Palette: enhanced, Alpha: 0, Reverse Waterfall: unchecked). The Driver Engine is set to Hardware, and the Multimeter is configured with Analog Peak Hold (1000), Digital Peak Hold (500), Average Time (1000), Attack Time (250), and Decay Time (750).
- 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 (40M RTTY) and 7.046 000 MHz (LOSC). The signal strength is -83.1 dBm. The waterfall display shows a dense signal at 7.0774 MHz. The CPU usage is 6.7%.
- Control Panels:** Various control panels are visible, including AF (20), RF (80), PWR (50), AGC (Med), SQL (110), and SQL (150). The VFO section shows VFO A (7.070 000 MHz) and VFO B (7.092 898 MHz). The DSP VFO A section includes NR, ANF, NB, NB2, BIN, SPLIT, A < B, A > B, XT, and RIT. The Mode Specific Controls - Phone section includes Mic Gain (35), COMP (3), CPDR (2), VOX (200), and GATE (-40). The Display Mode is set to Panefall_inv, and the Transmit Profile is empty.

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 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 signal strength is -84.9 dBm. The main display shows a spectrum plot with a signal at 7.033 720 MHz. The interface includes various controls for AF, RF, PWR, AGC, SQL, and G40. The CPU usage is 8.7%. The interface also shows various filters and modes, including VFO A Mode - LSB, VFO A Filter - 2.7k, and Mode Specific Controls - Phone. The Display Mode is set to Panafall_inv, and the Transmit Profile is set to 1. The interface is dark-themed with green and yellow text.

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 MHz, 40M CW
- VFO B:** 7.033 757 MHz, 40M CW
- Transmit Frequency:** 7.046 457 MHz
- Signal Strength:** -113.1 dBm
- Band - HF:** 40 MHz selected
- VFO A Mode - CW:** CW selected
- VFO A Filter - 1.0k:** 1.0k selected
- Mode Specific Controls - CW:** CW Speed: 25, Semi Break In, CW Pitch (Hz): 600

The interface also shows various other controls such as AF (20), RF (21), PWR (50), AGC, SQL (110), and CW Speed (23). The CPU usage is 9.2%.

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 the 'PowerSDR Setup by GenesisRadio' dialog box open. The 'Audio' tab is selected, showing 'Primary Sound Card Setup Details' for a 'Digital VAC' sound card. The 'Audio Output Voltage' is set to 1.00, and a 'Test' button is visible. A small 'Calibrate Sound Card' dialog box is open in the foreground with an 'Abort' button. The main interface shows VFO A at 7.026 500, VFO B at 7.033 757, and a signal strength of -111.7 dBm. The 'G40' display shows 7.046457. The 'CPU' usage is 7.7%. The 'Display' window shows a spectrum plot with a peak at -113.0 dBm. The 'Mode Specific Controls - CW' section shows 'Semi Break In' and 'CW Pitch (Hz)' set to 600. The 'Display Mode' is set to 'Panafal_Inv'. The 'Display zoom' is set to 1x.

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 key elements:

- PowerSDR Setup by GenesisRadio:** A dialog box for audio configuration. The "Audio Output Voltage" field is highlighted with a blue box, and a "Test" button is visible.
- Sound Card Calibration:** A small white dialog box in the bottom-left corner with the text "Sound Card Calibration complete." and an "OK" button.
- Genesis Radio 32bit v2.0.16:** The main software window showing a spectrum display with a signal at 7.046 457 MHz. The signal strength is -111.9 dBm. The interface includes various controls for VFO A, VFO B, and LOSC, as well as a signal strength meter and a band plan table.

Band	HF	80	60
160	80	60	
40	30	20	
17	15	12	
10	6	2	
More WWV GEN			

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

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

Gain: 0.00

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

Refresh this Gadget

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eHAMspotter DXwatch

Genesis radio 52bit v2.0.10

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

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 Med

SQL 110

SQL 150

G40

7.046457

CPU %: 10.0

Display

-45

-55

-65

-75

-85

-95

-105

-115

-125

-135

Signal Fwd Pwr

-111.8 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

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

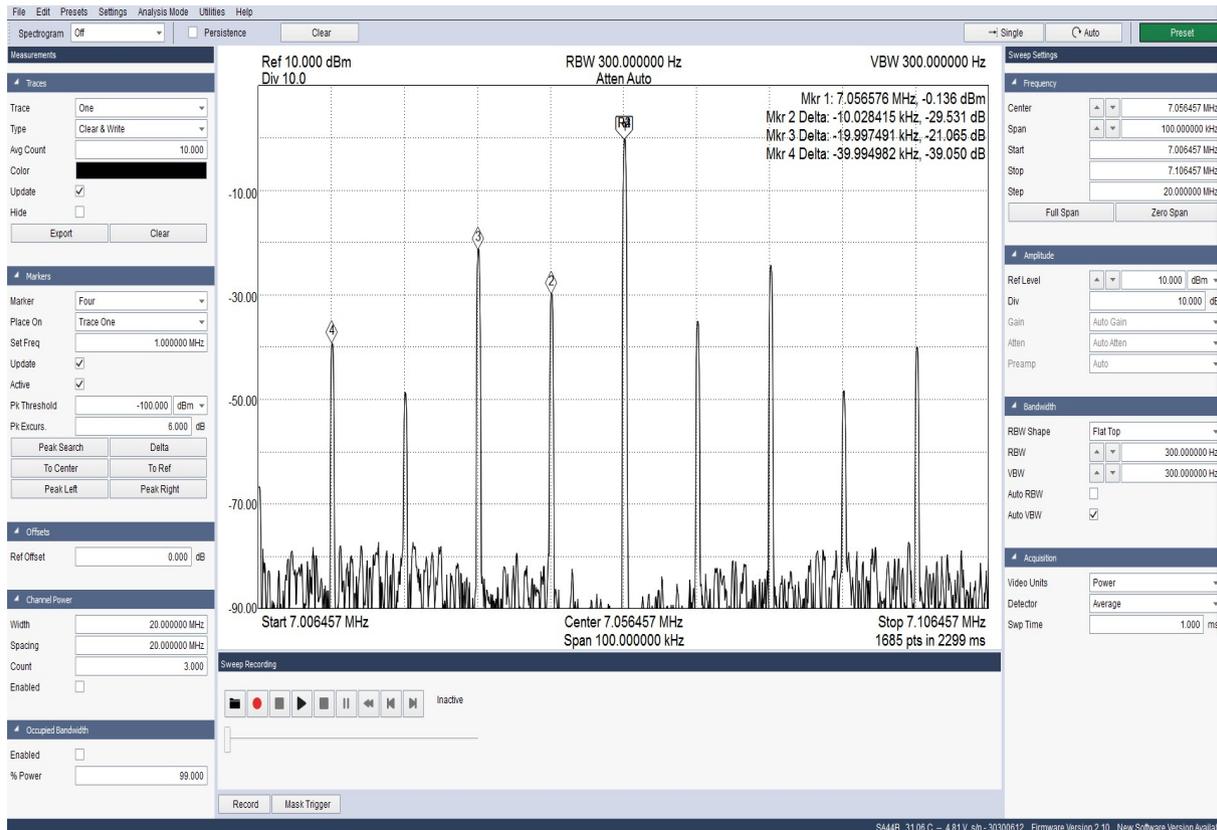
Zoom

-117.8dBm

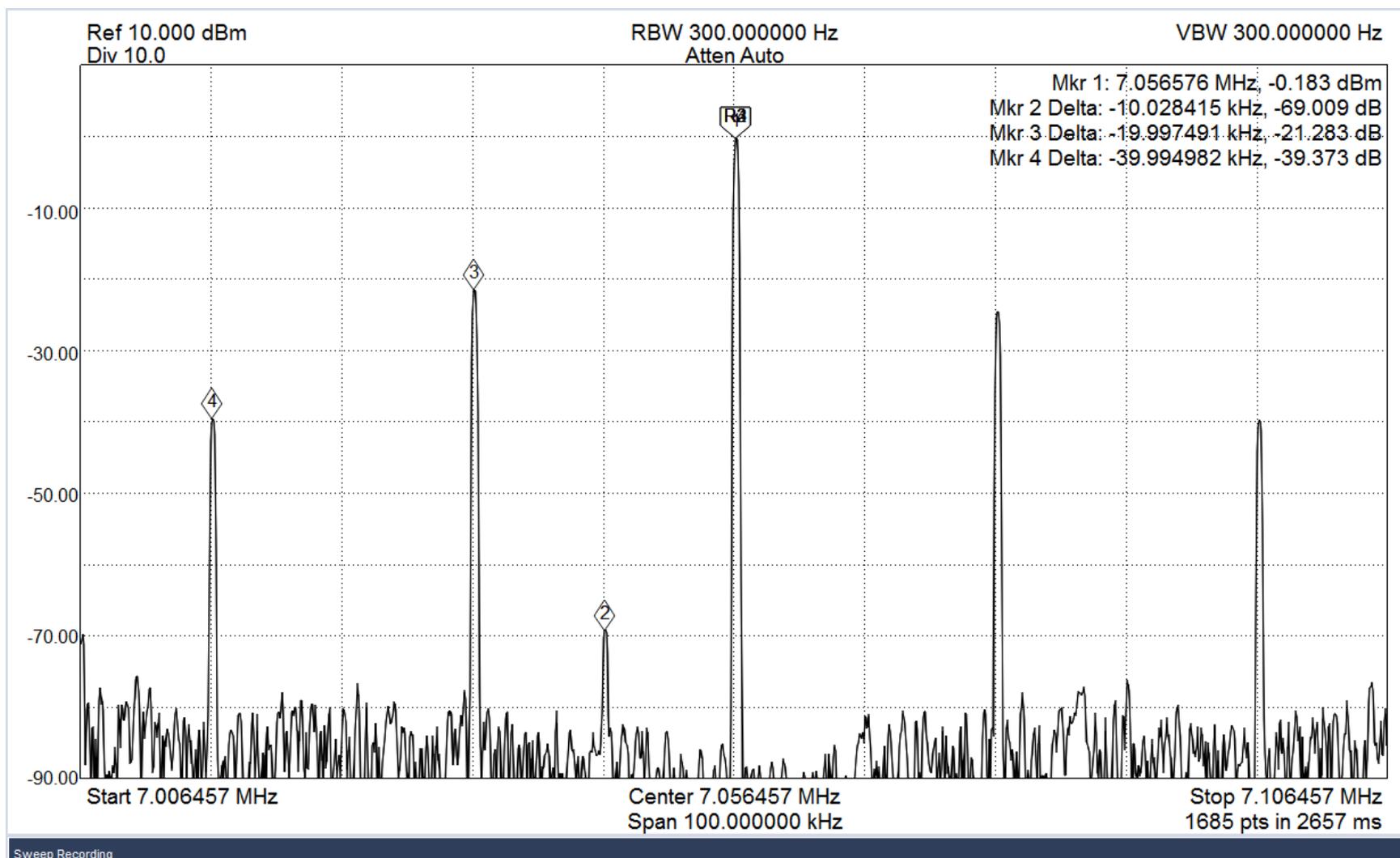
-17178.5Hz

7.029 279 MHz

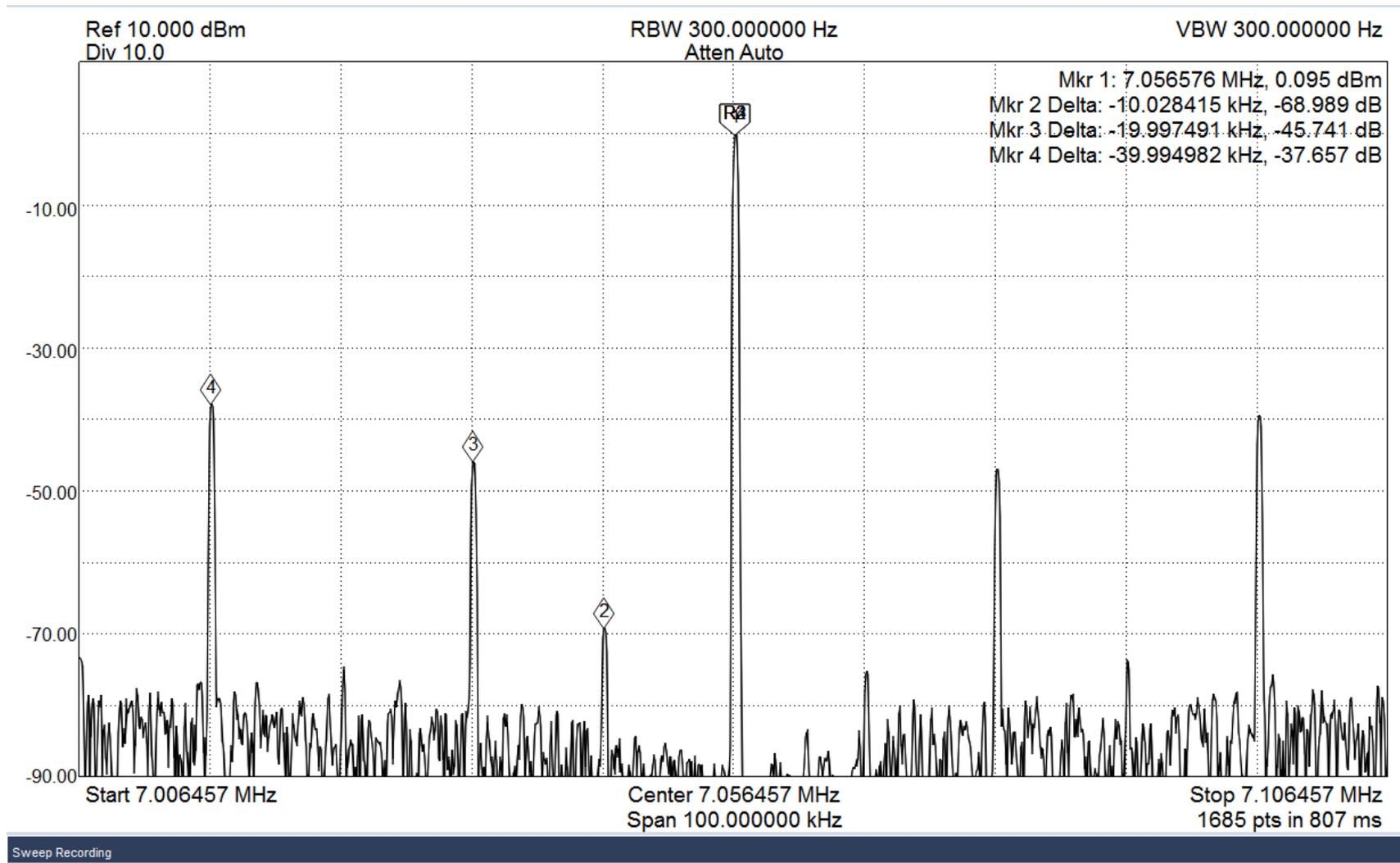
To make explaining this easier I'm using a Spectrum Analyzer. Another receiver can be used. To make this process easier lets pick an offset from the LOSC that we can easily figure out the 1st, 2nd, 3rd and 4th signals that we need to work with. I chose 10khz. Lets go over the markers. 1 is the transmitted signal, 2 is the LO signal, 3 is the TX Image, 4 is a signal that is adjusted by your sound card drive level. A strong signal here is caused by overdriving the radio.



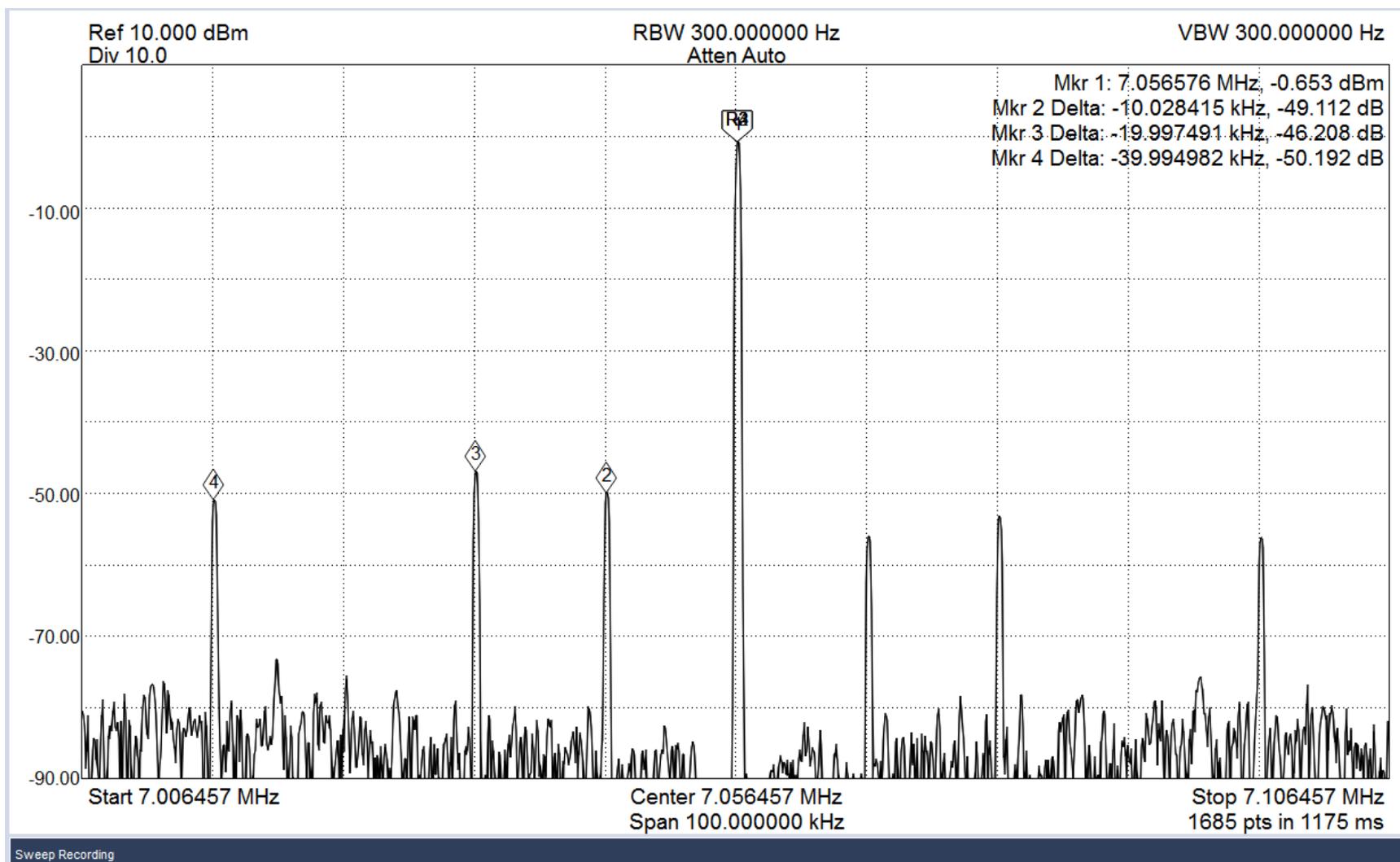
First thing we are going to do is adjust the trimmers, R9 and R10 back and forth until we get the LO(2) reduced as far as we can go while transmitting into a dummy load. Make sure you monitor the PA heat sink! Let cool between adjustments as necessary!



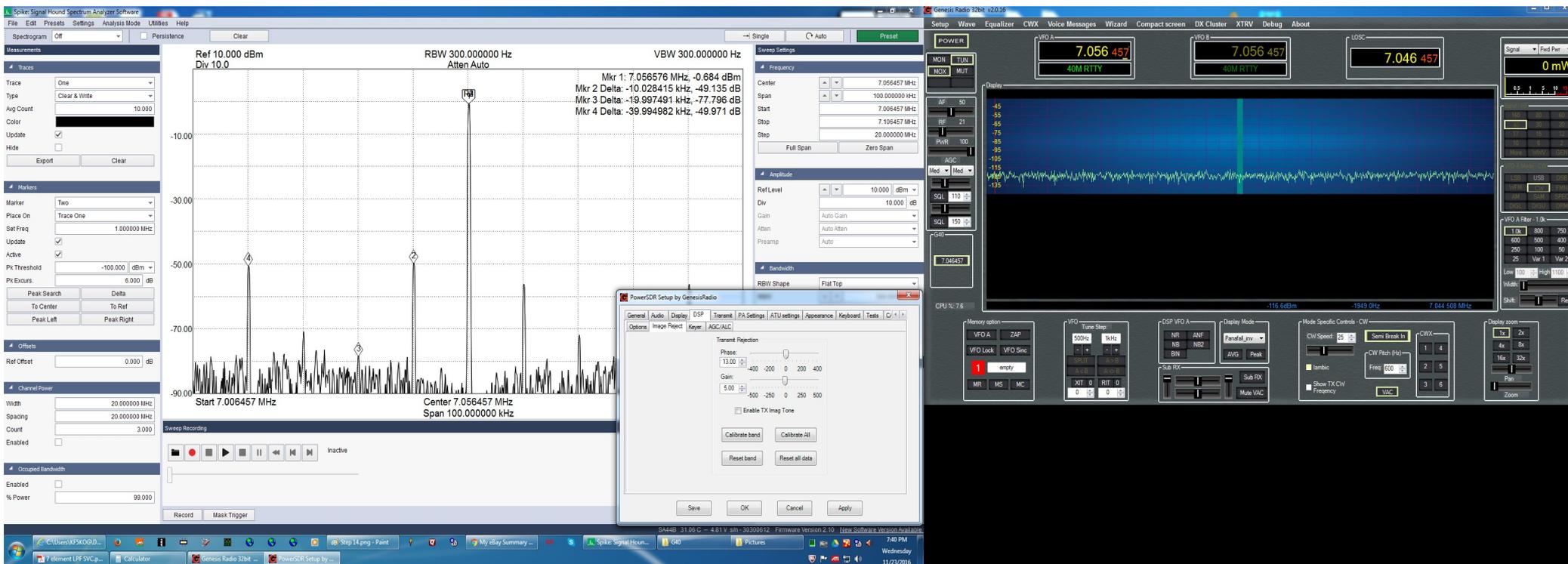
Now adjust the TX image(3) with Trimmer R67 for lowest level. This is only half the adjustment. Software is next.



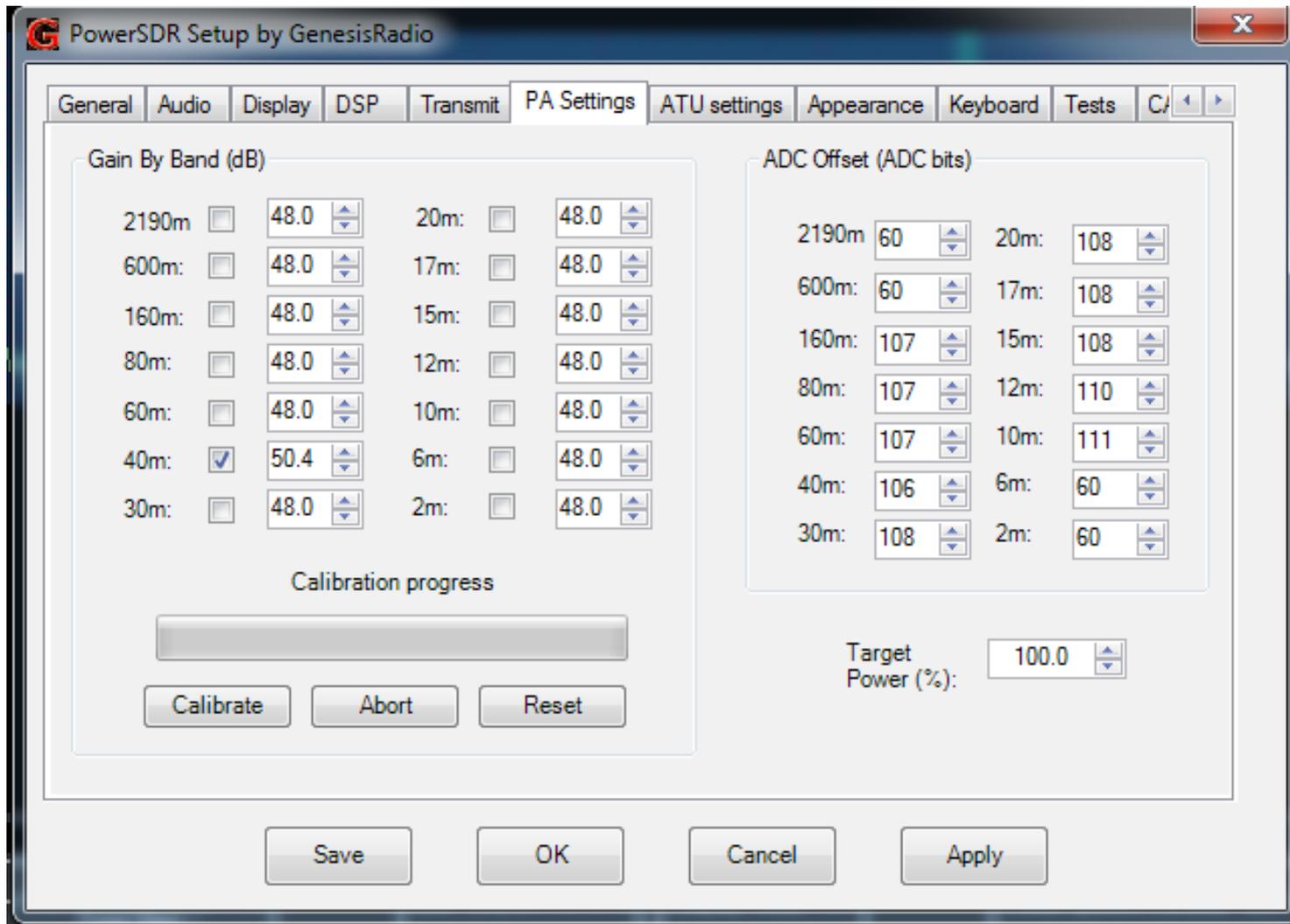
You may have to go back and adjust the LO signal again.
Everything seems to interact with each other. LO, TX
and RX image adjustments.



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!



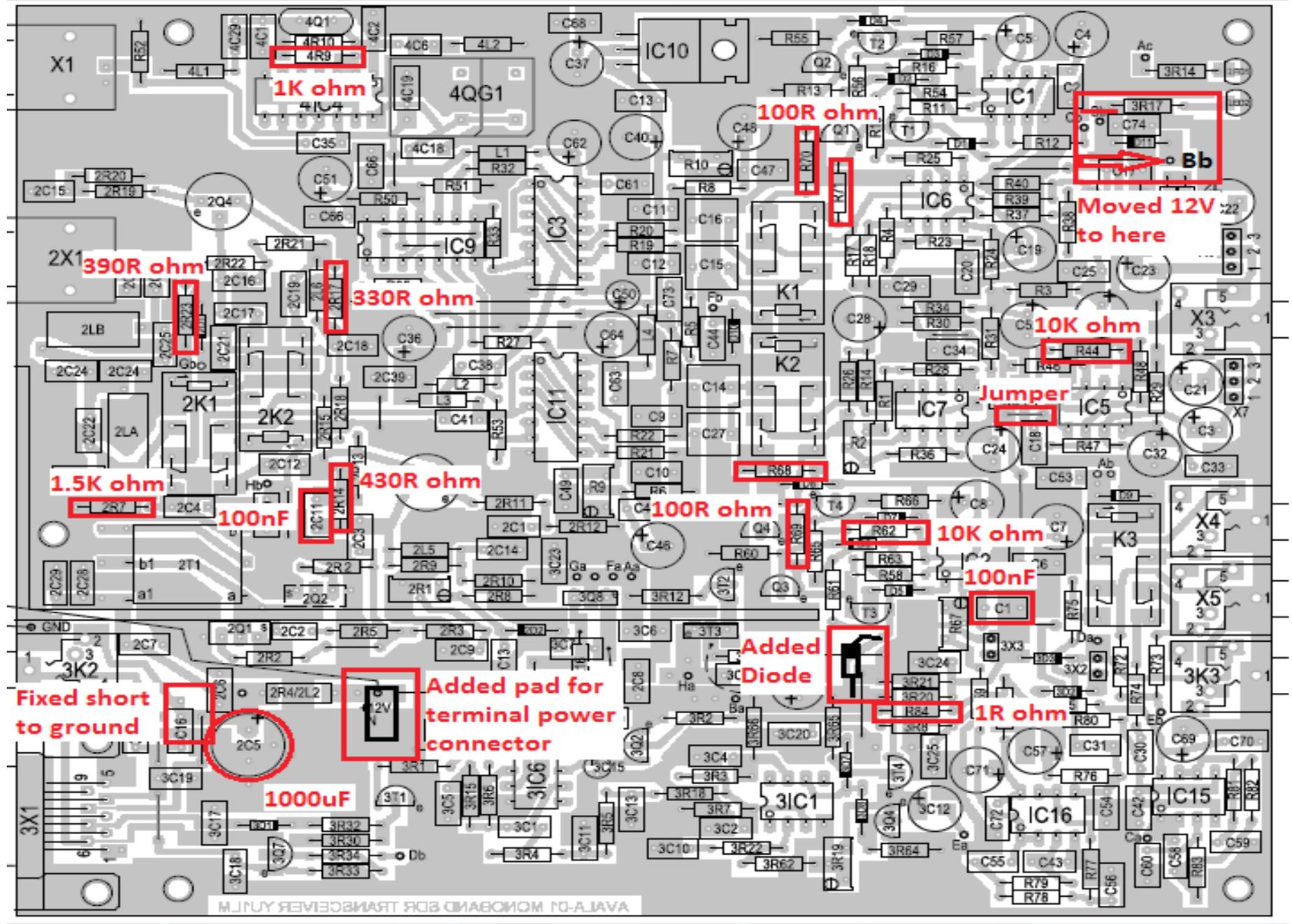
Changes to new production of Avala-01 PCB

The following pictures document the changes
made to the Avala-01

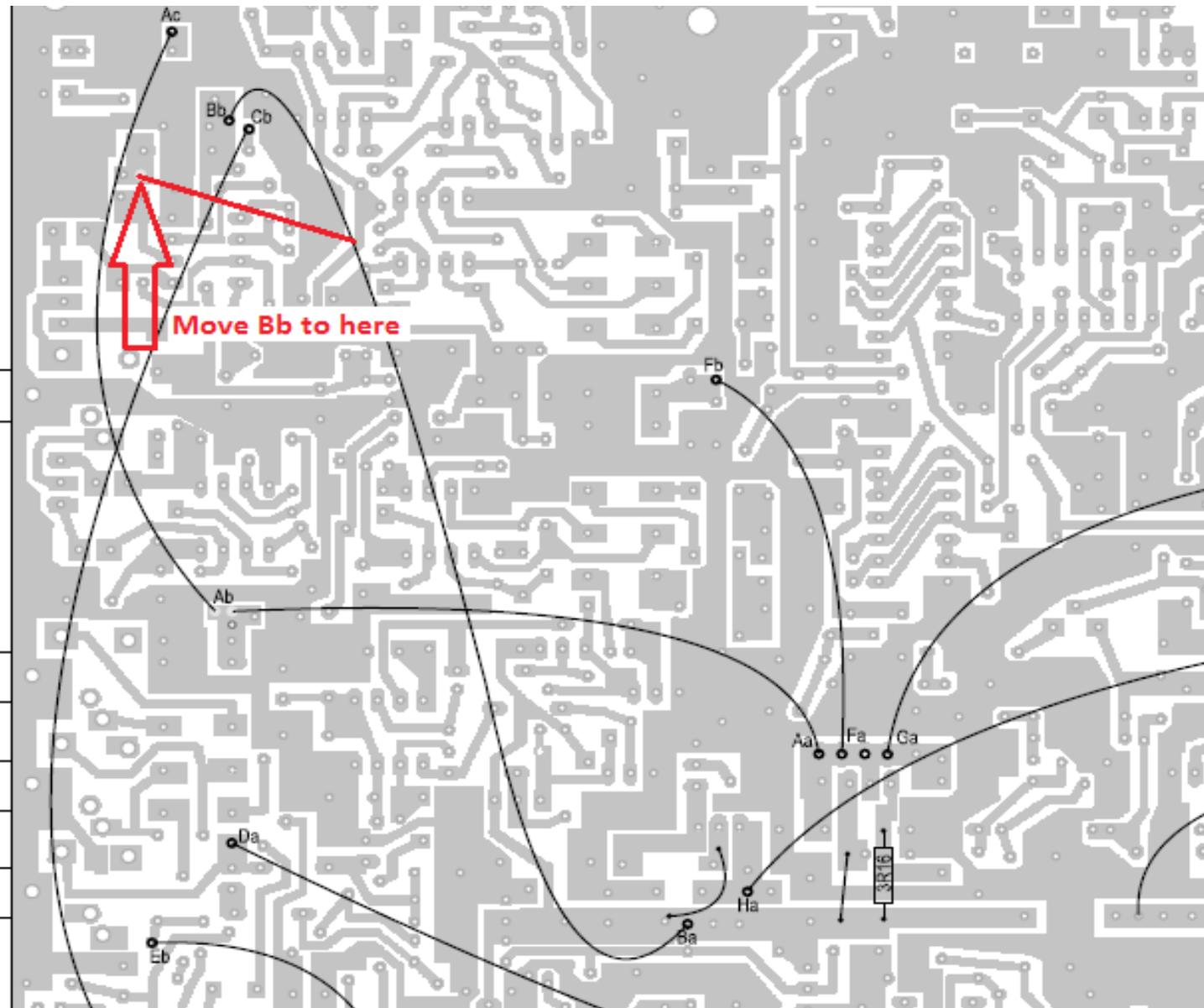
Changes to new production of Avala-01 PCB

The following pictures document the changes
made to the Avala-01

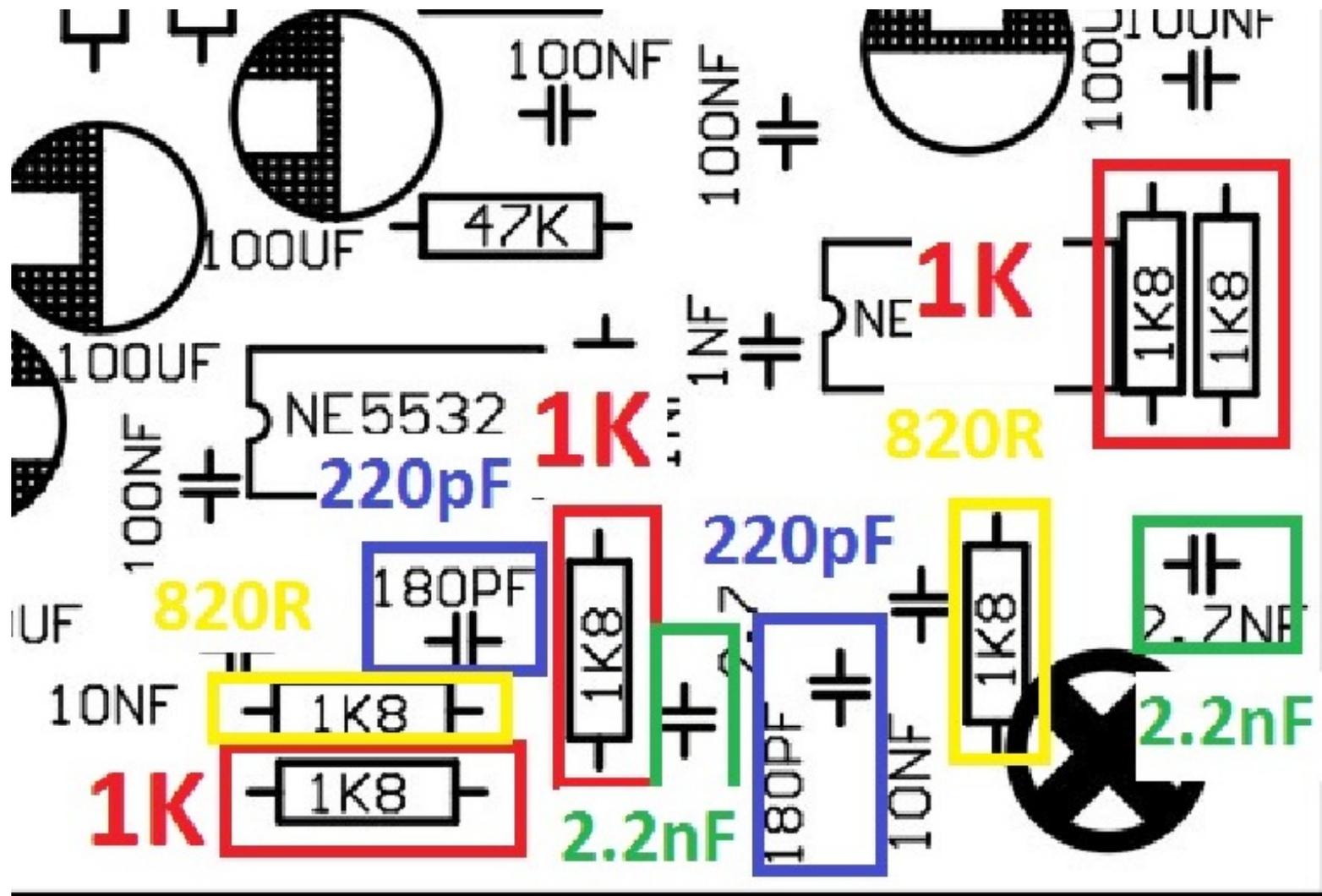
PCB top side



PCB Bottom side

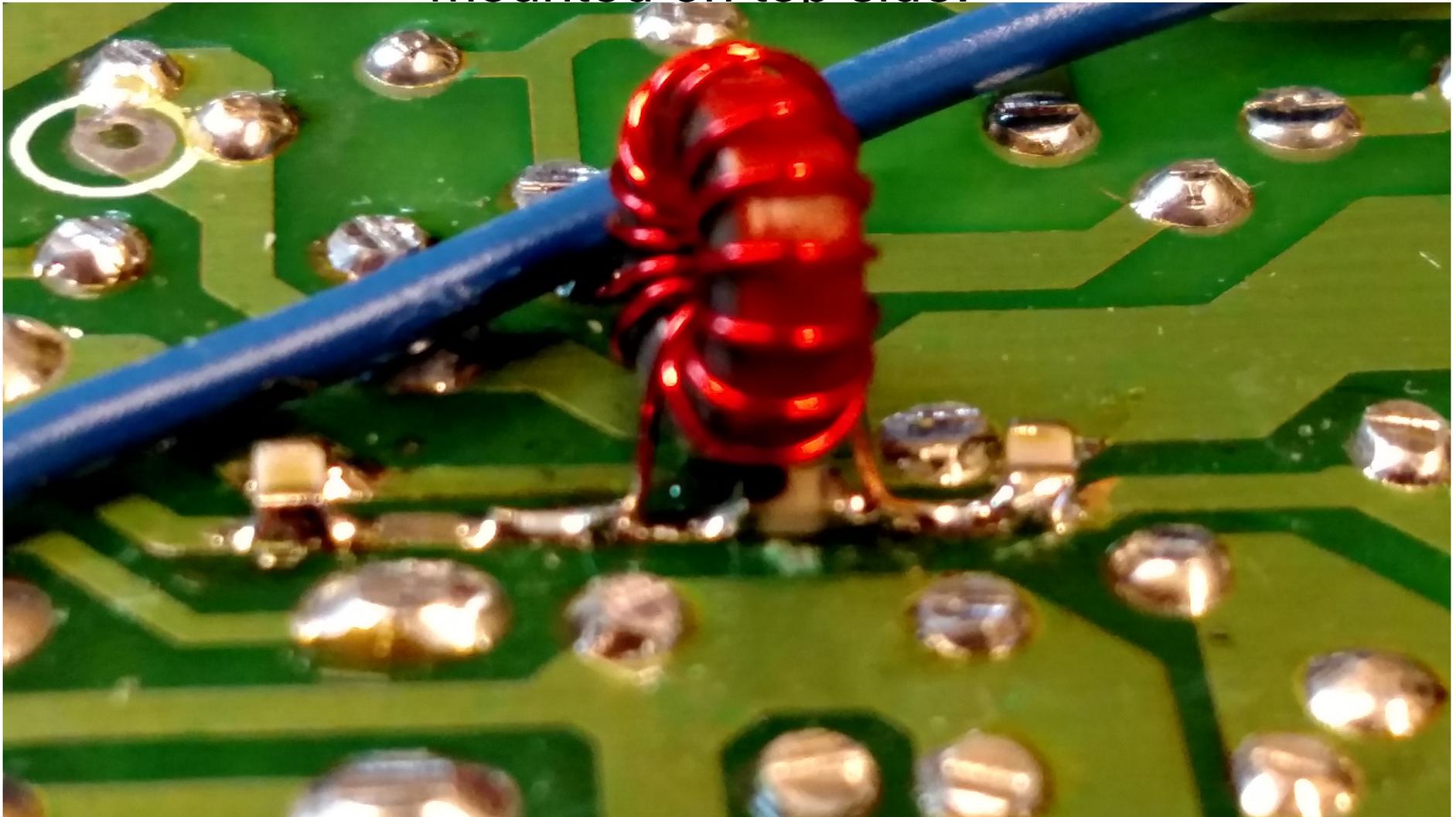


Changes to TX sample and hold LPF circuit, now 96khz sample rate



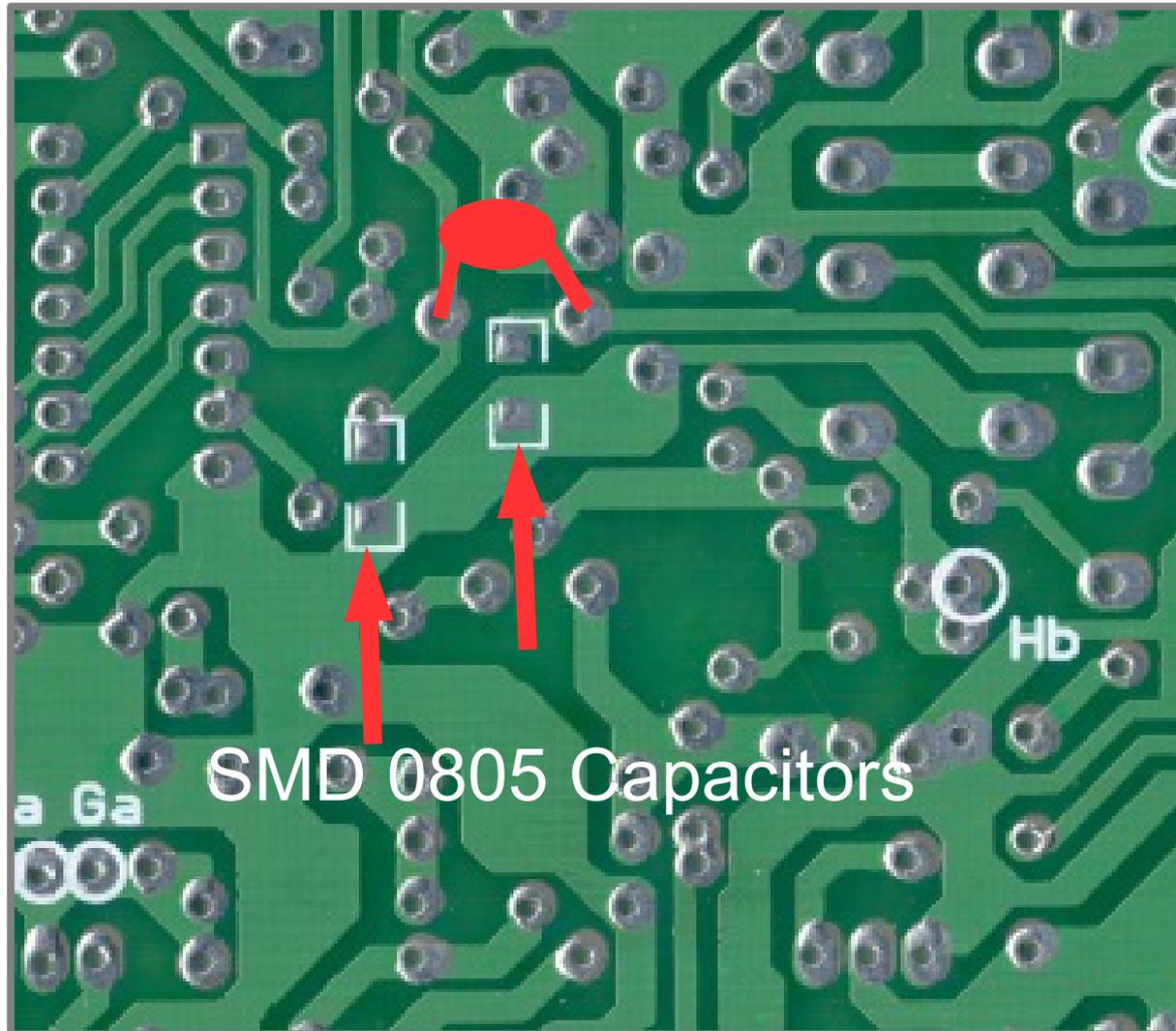
Adding simple LPF to mixer

Note: This picture was on older release PCB. New PCB has this filter included on PCB, see below. Toroid will be mounted on top side.



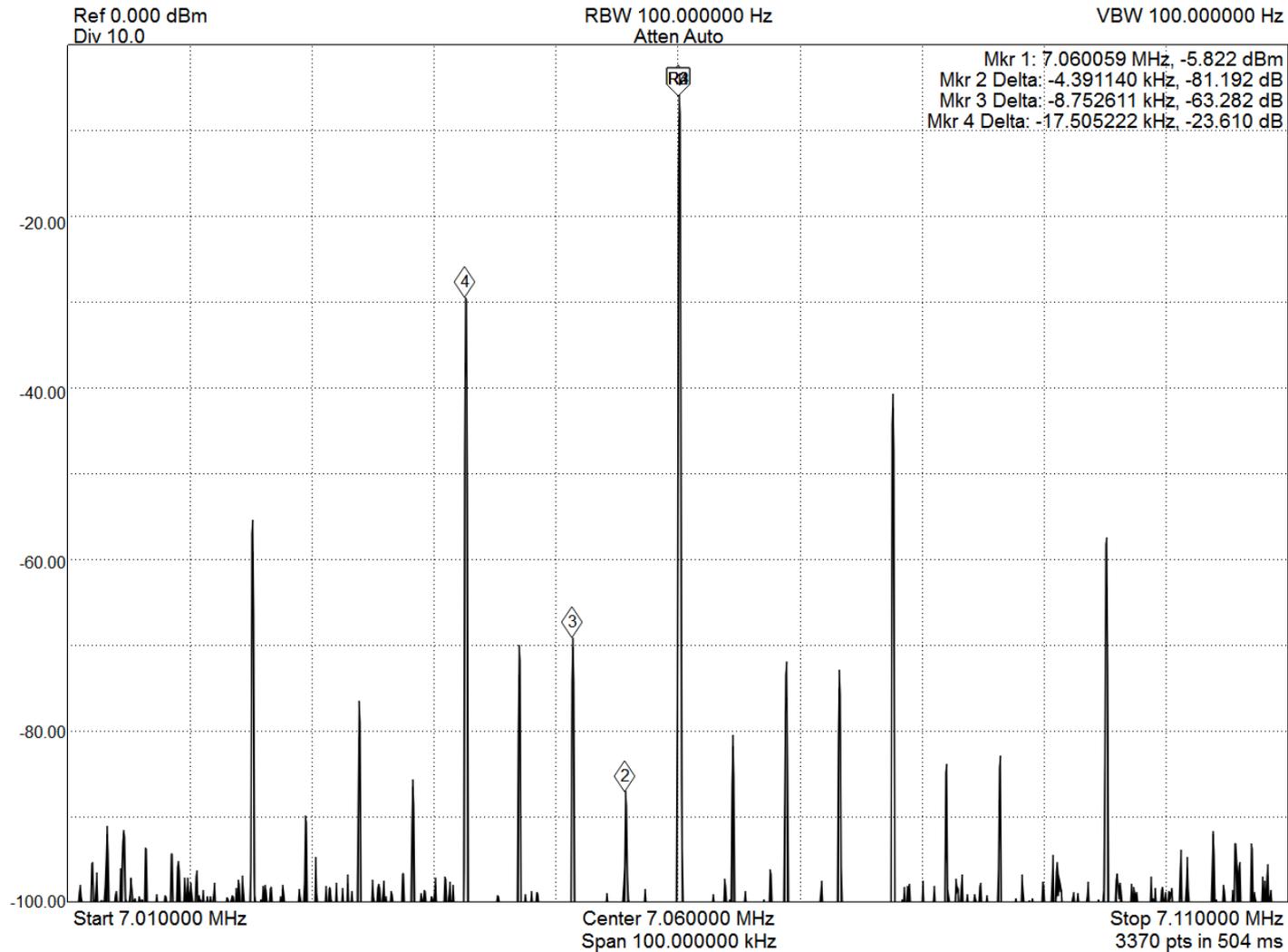
PCB Bottom

Radial Capacitor added to bottom

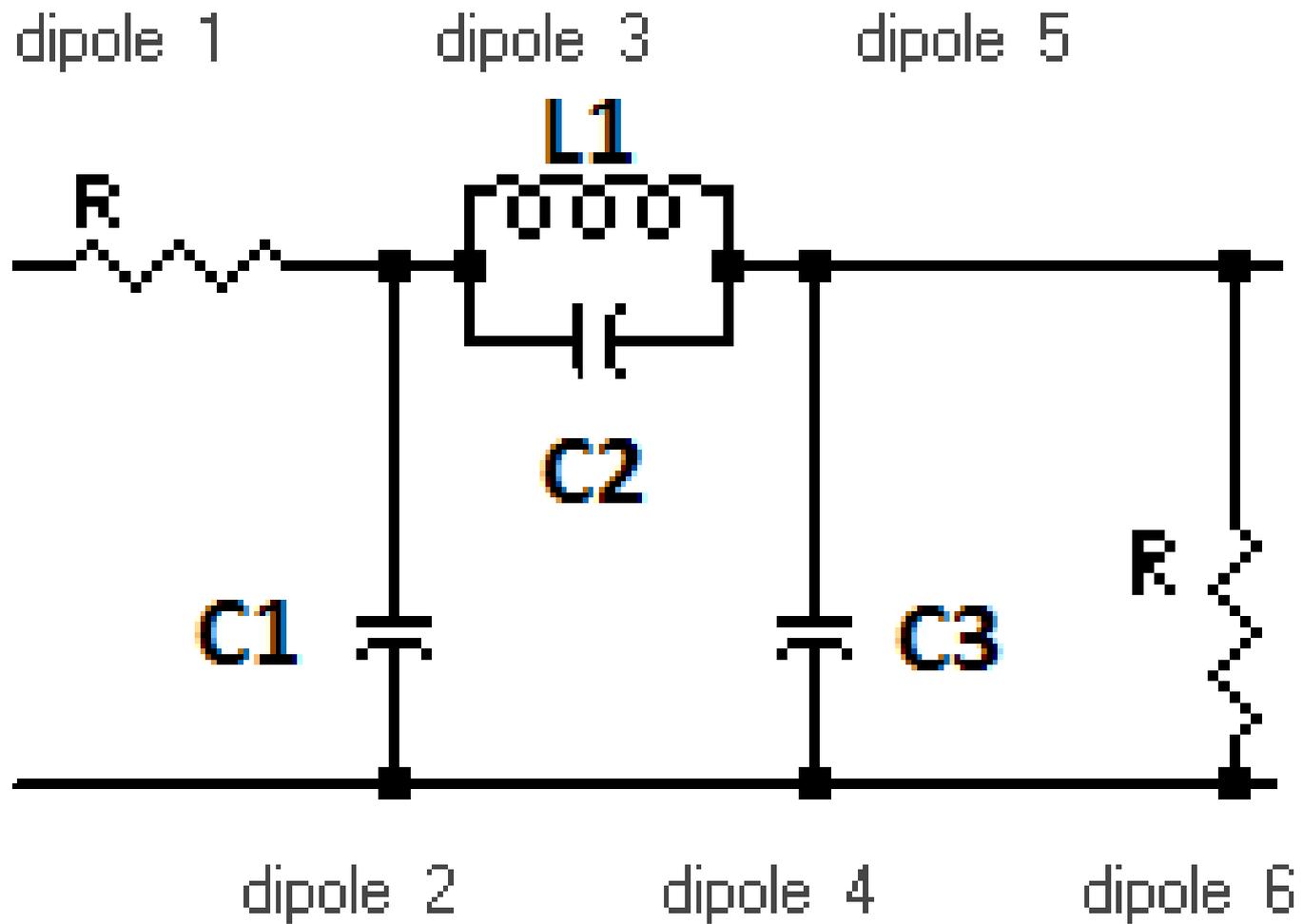


No LPF

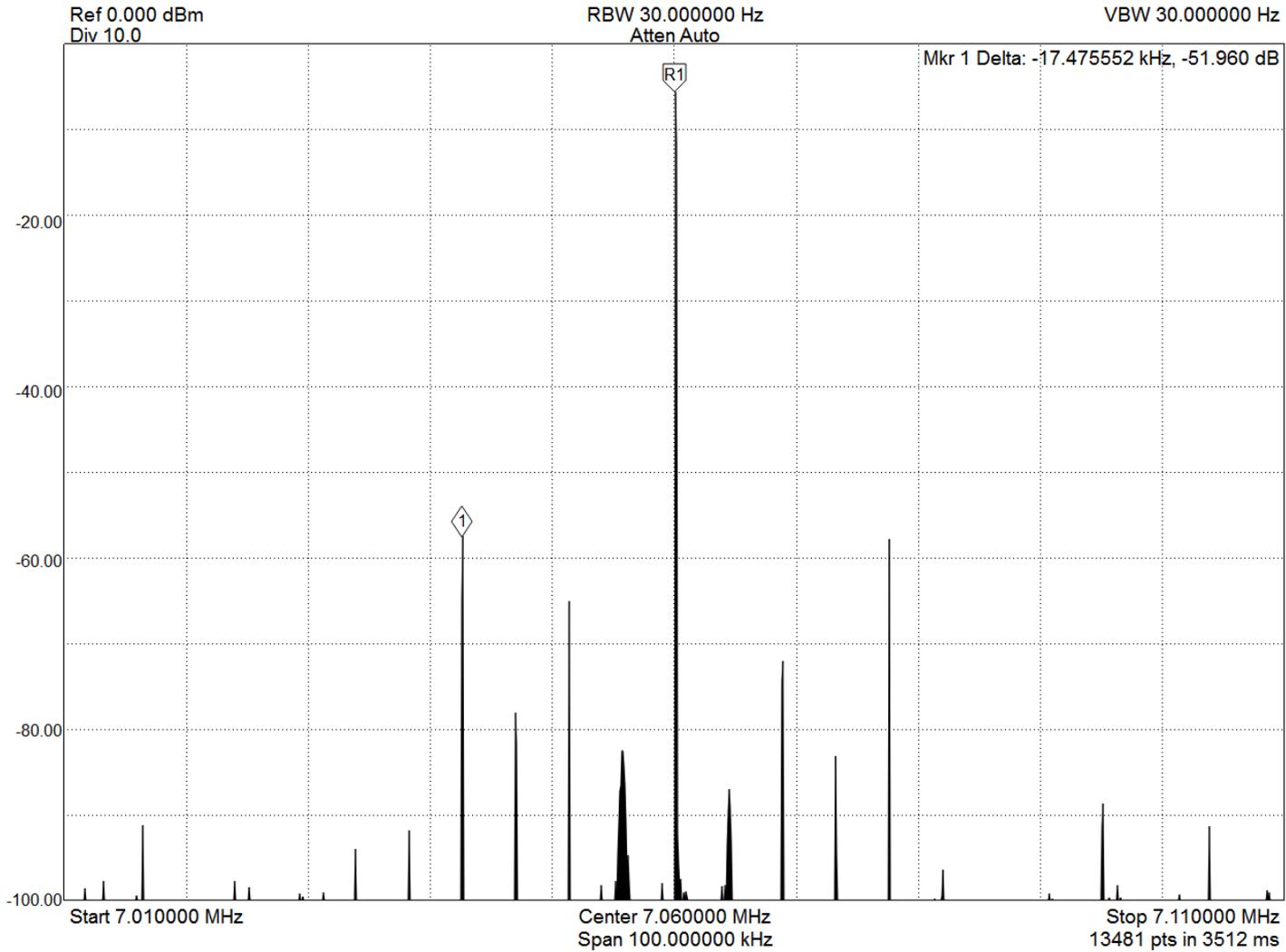
Marker 2 is LO SC; Marker 3 is TX Image; Marker 4 is the problem



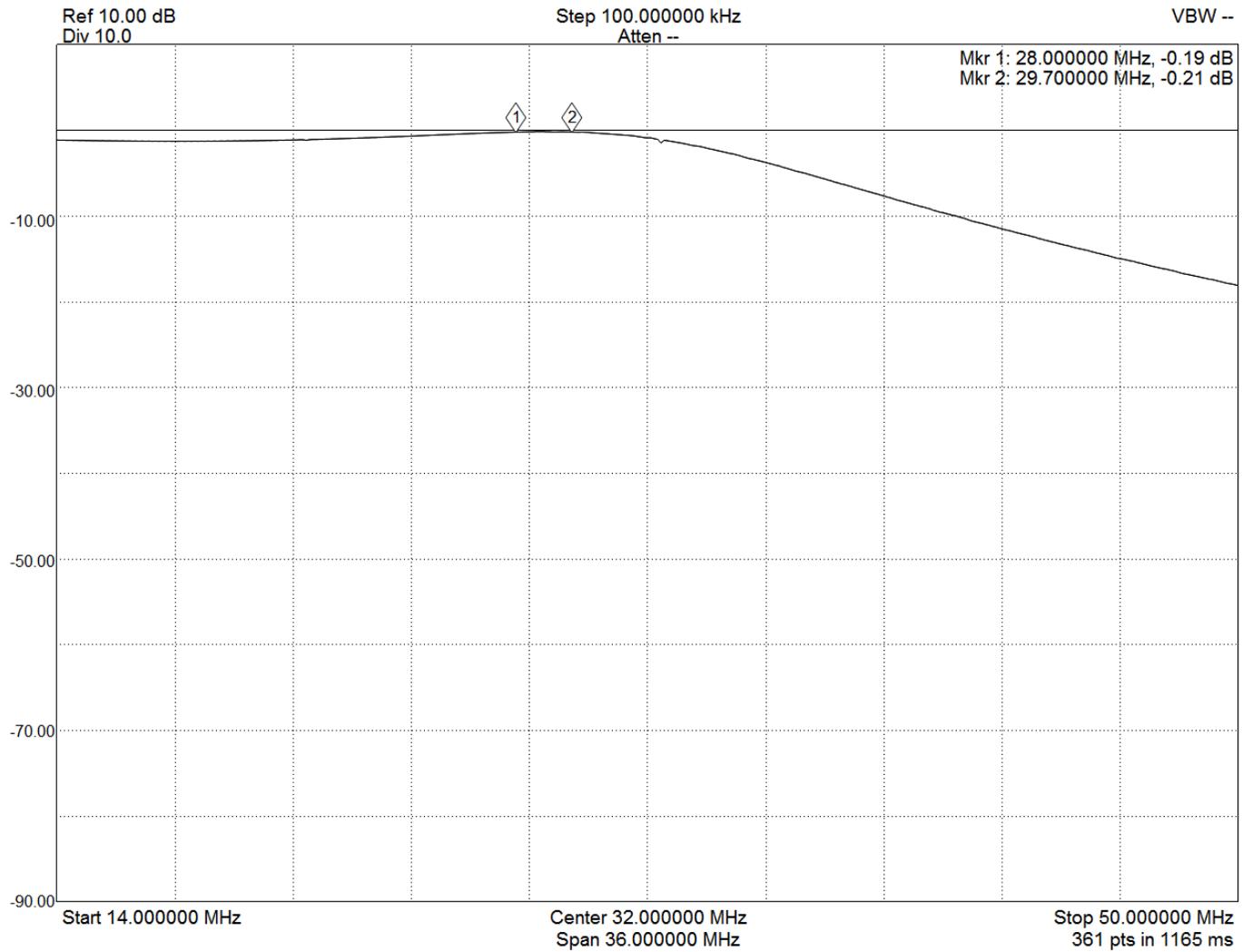
LPF



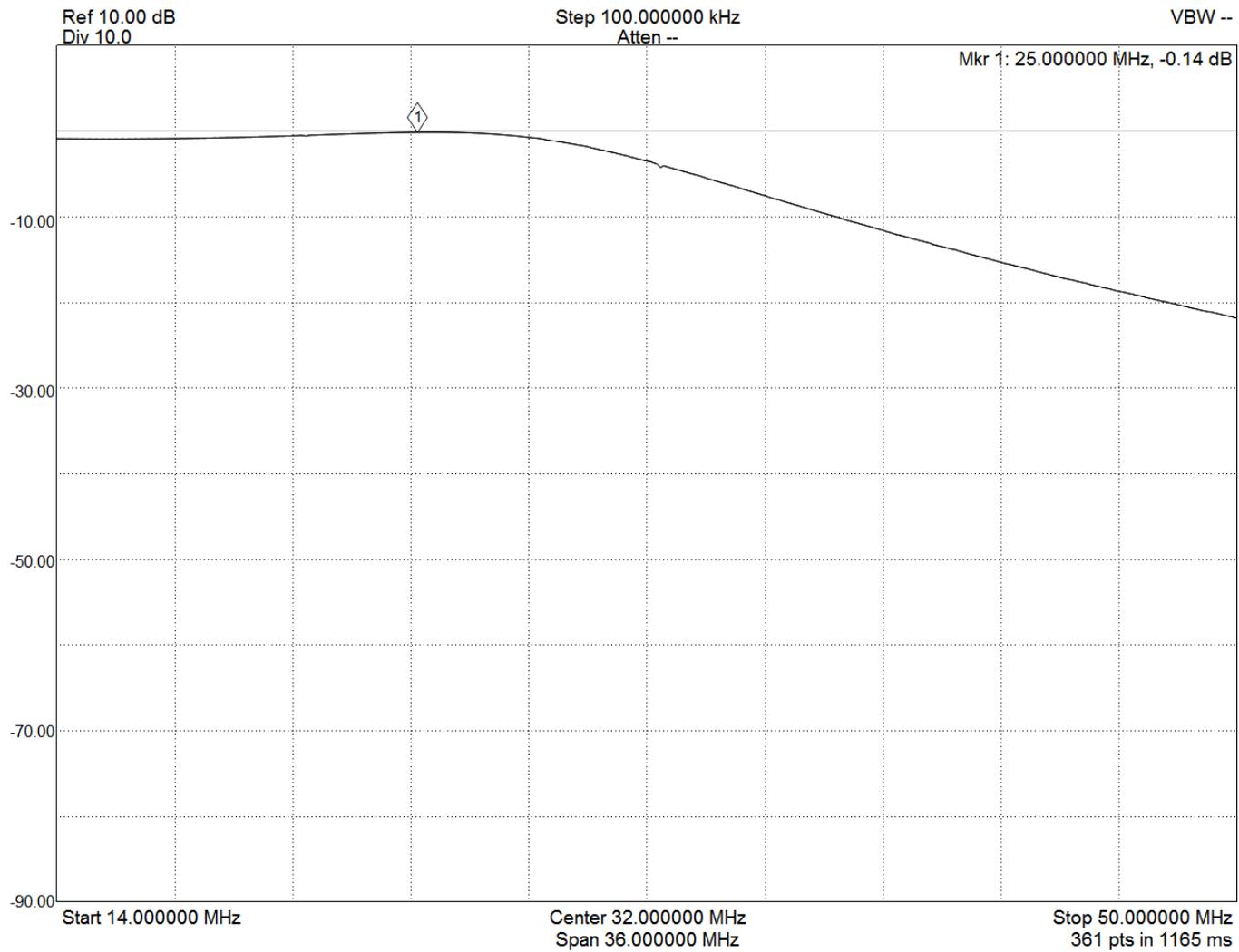
With LPF Problem fixed :)



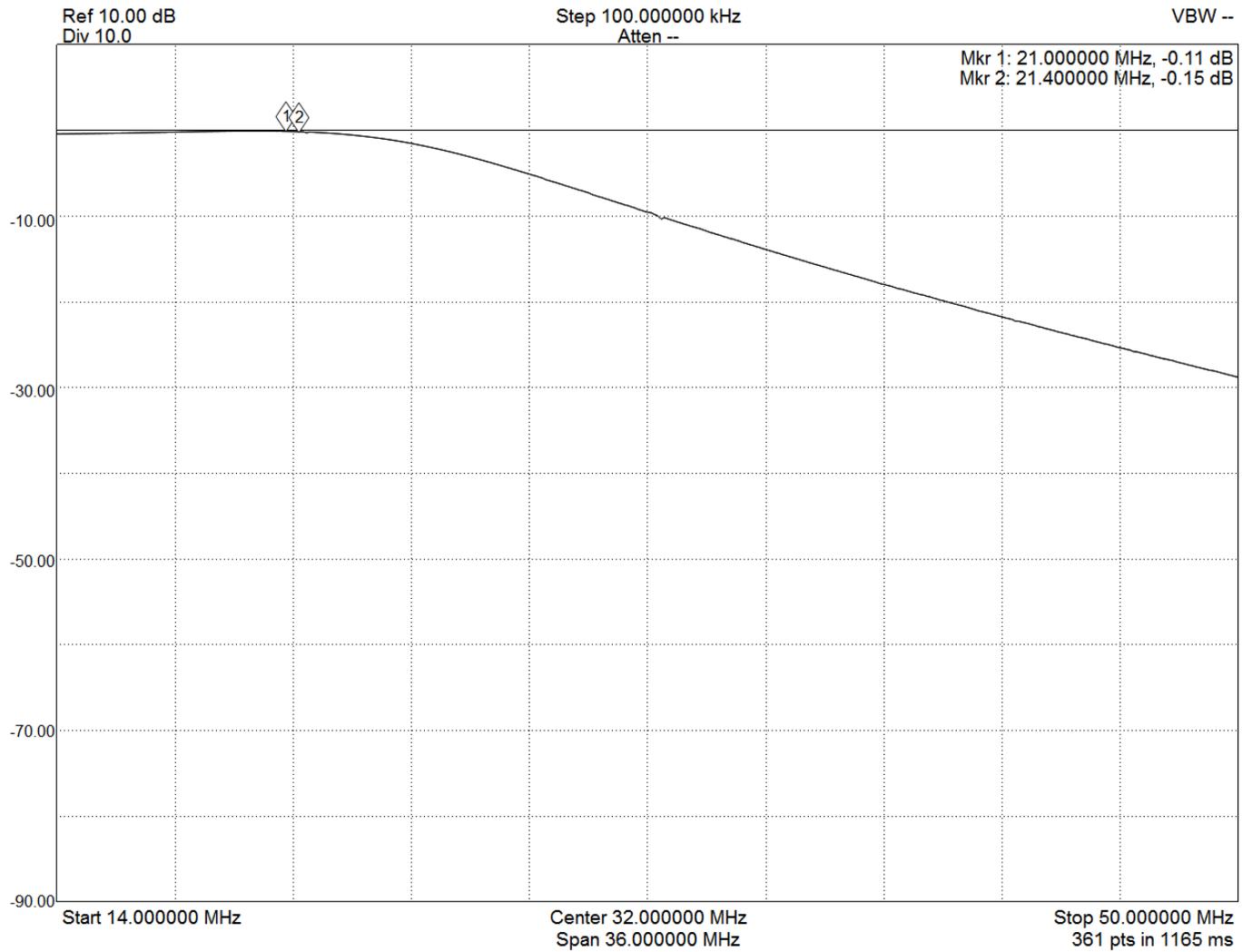
10M



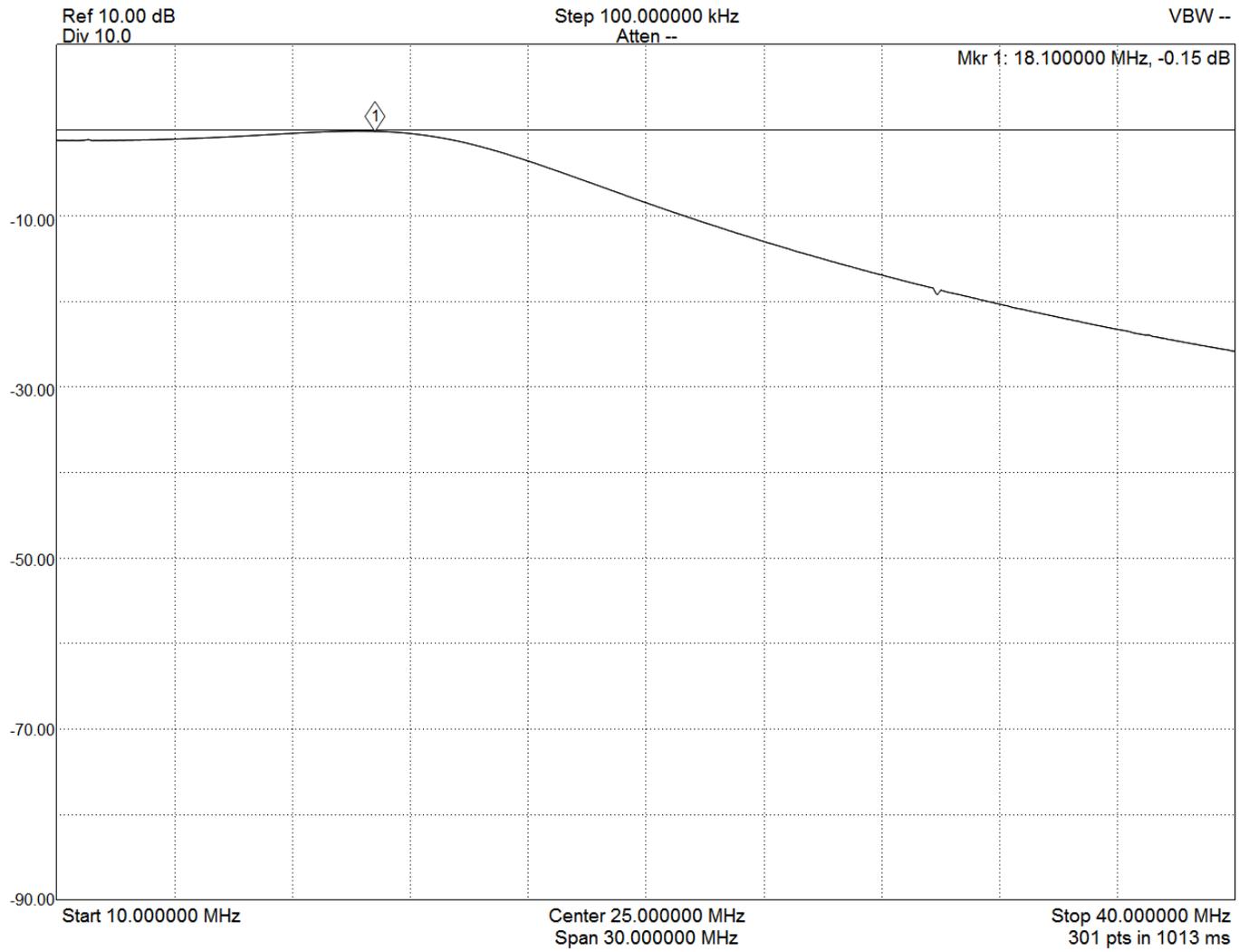
12M



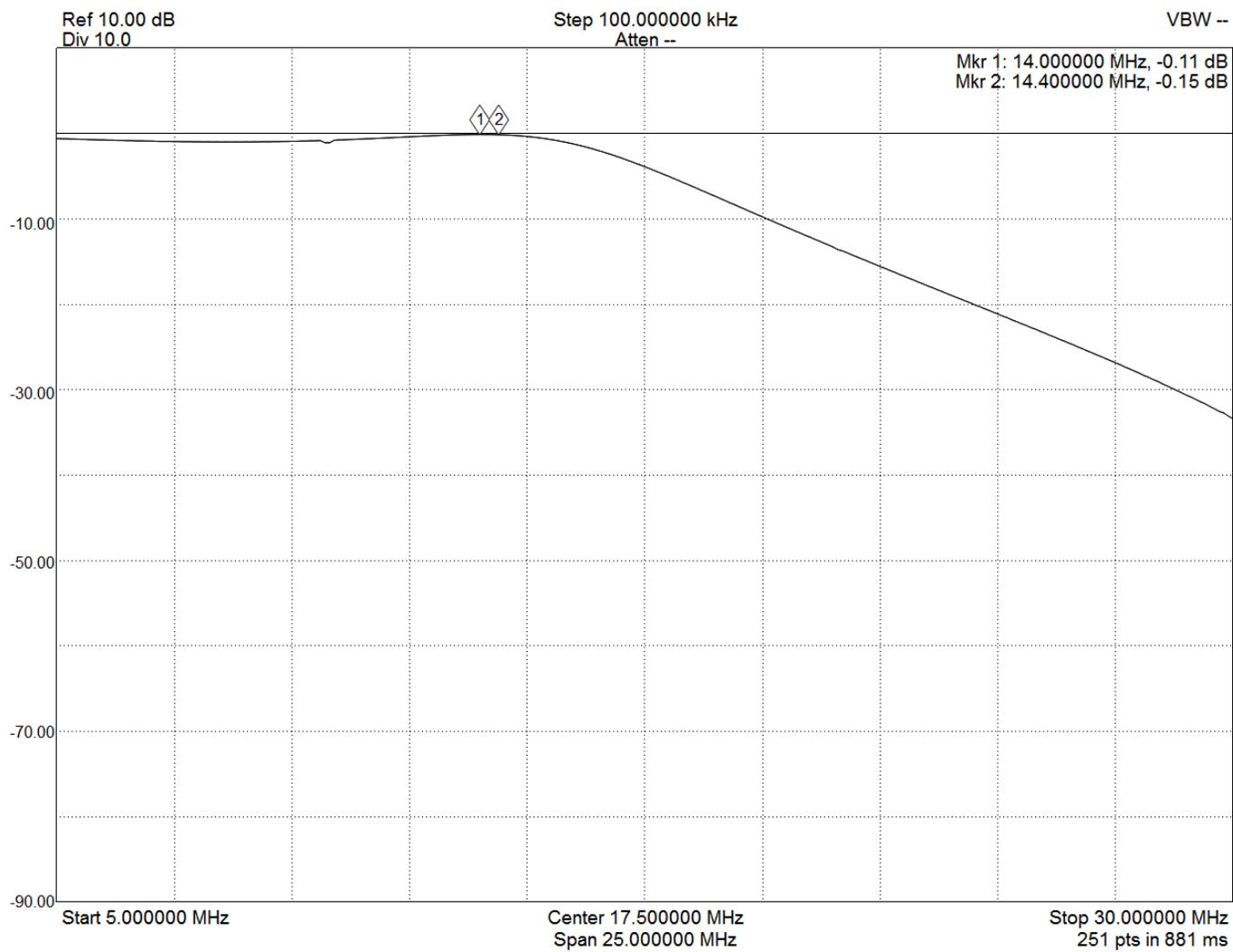
15M



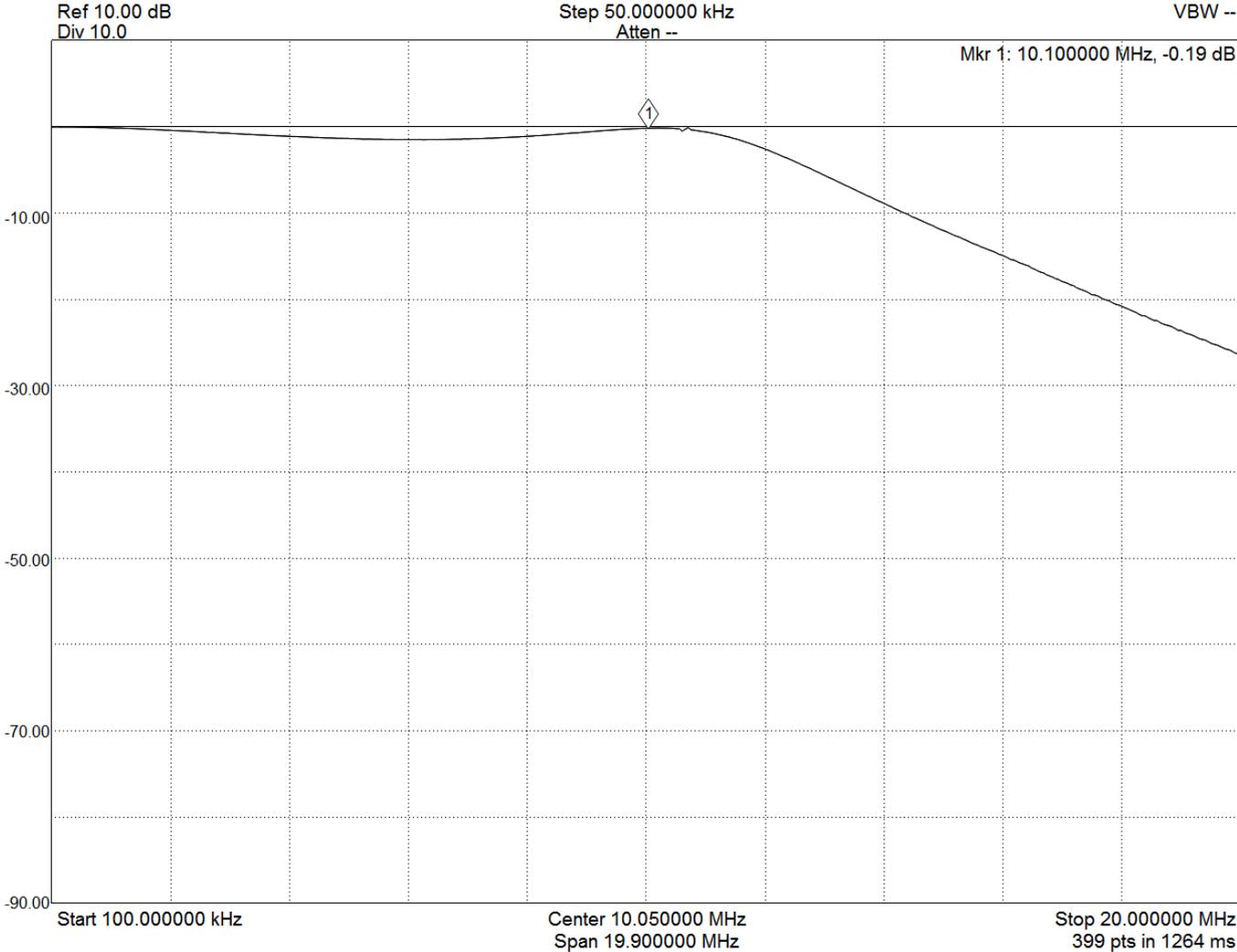
17M



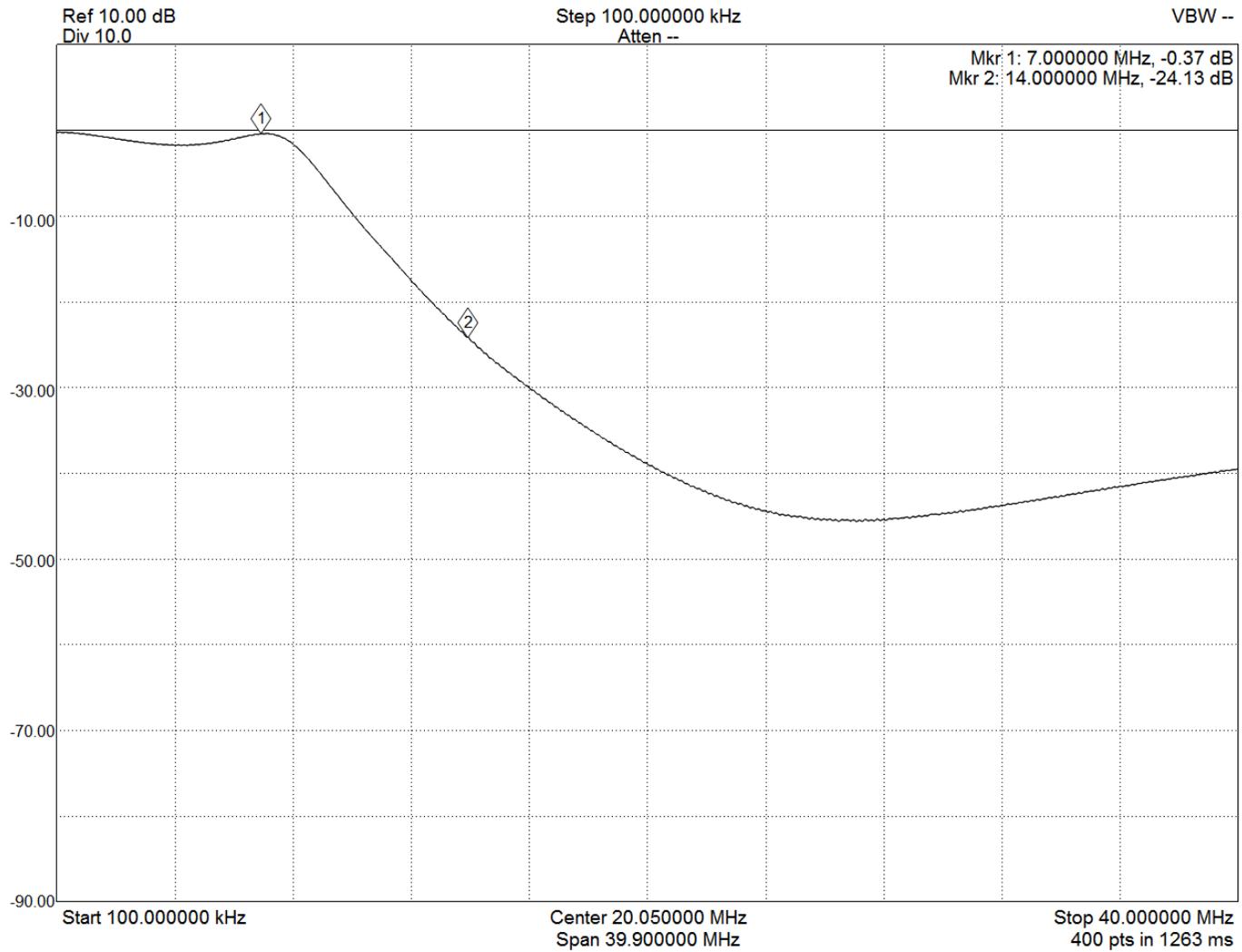
20M



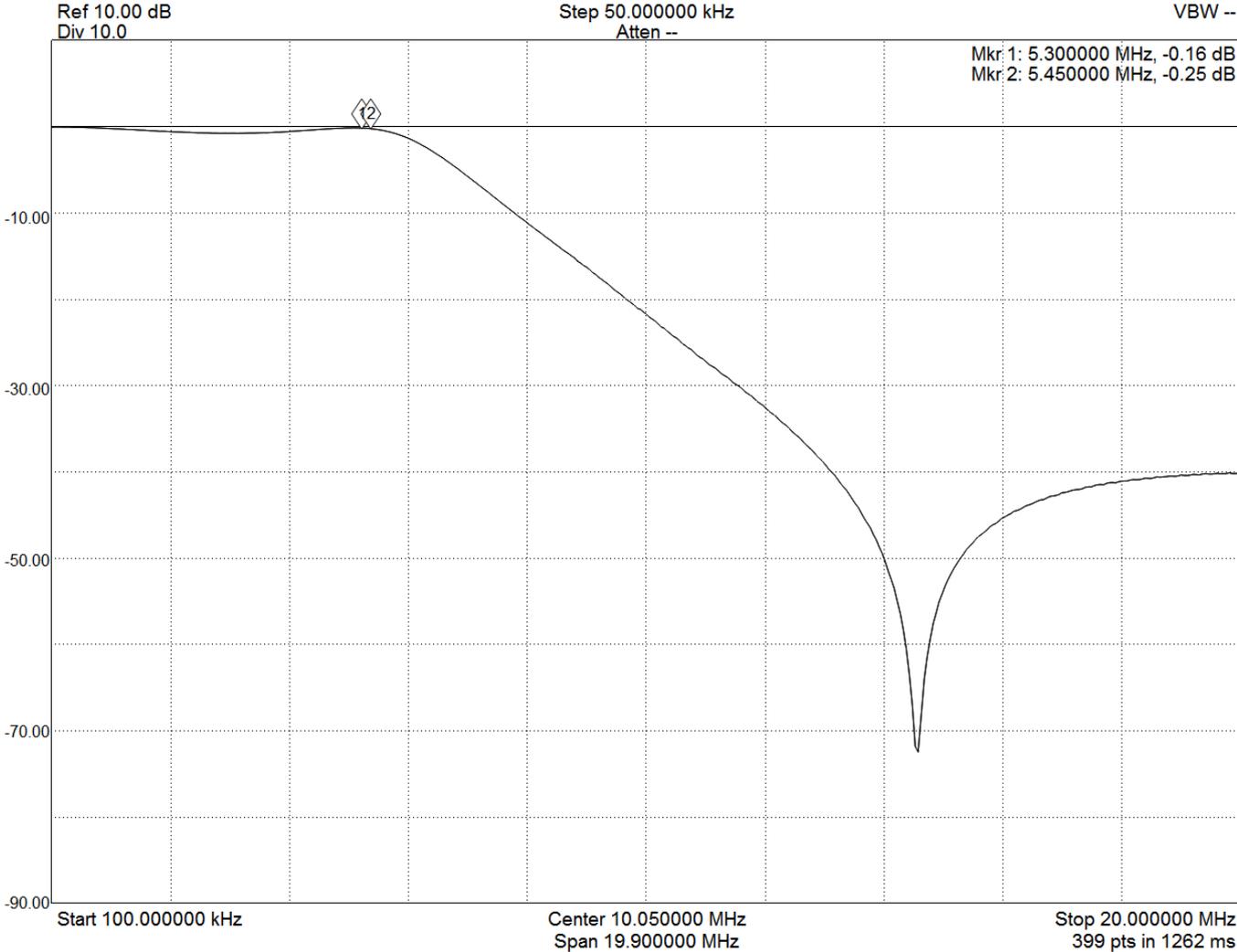
30M



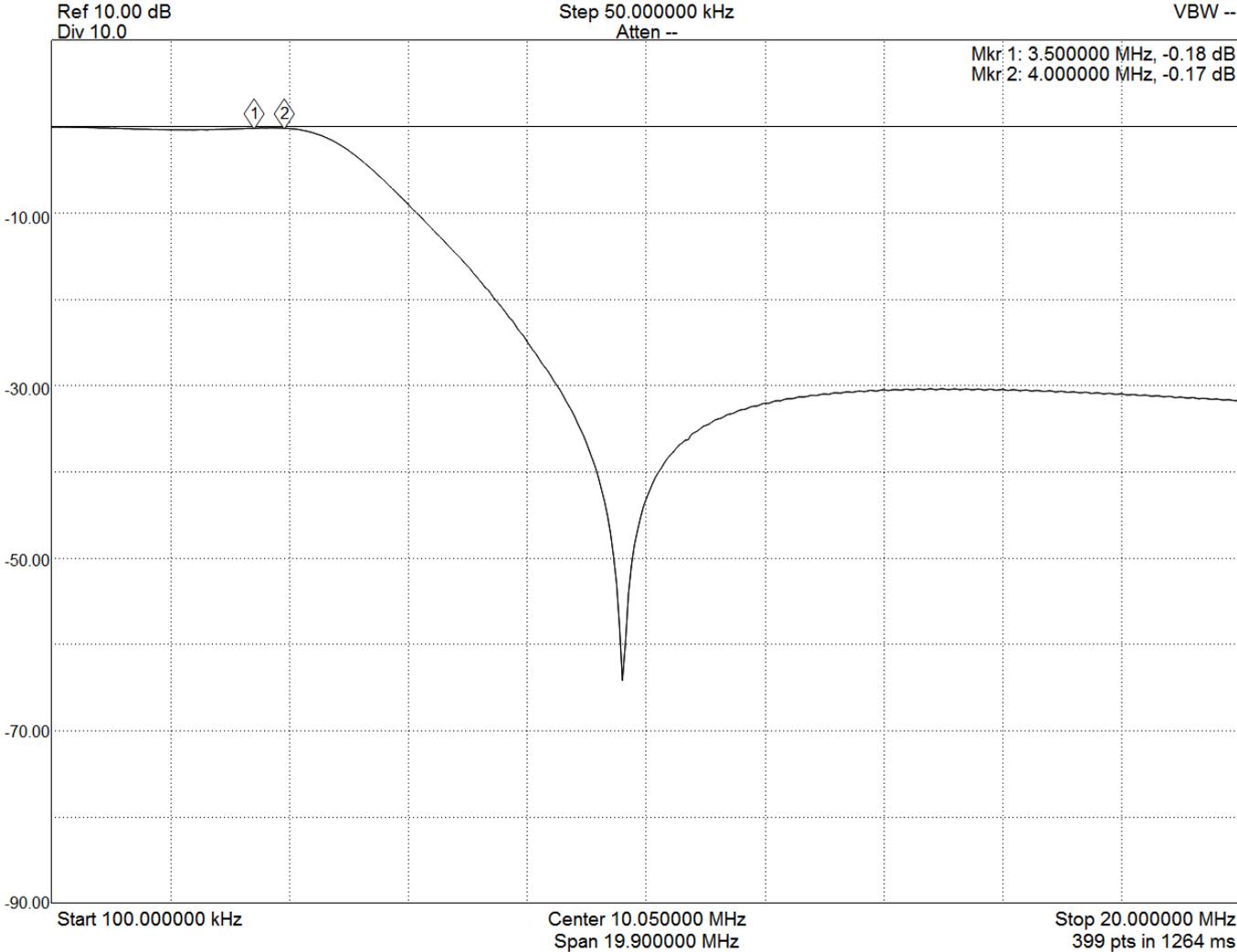
40M



60M



80M



160M

