GSDR-G3020 Setup settings helpfile (with EMU-0202 external sound card)

Version 1.0 -By Hans, LA2MOA

These are the <u>basic</u> settings I use for running GSDR together with my G3020 (and EMU-0202 sound card) <u>in CW-mode</u>. It all works fine. I'm sure the settings presented here also works with the G40. The tags in the index below that are containing <u>the minimum number of parameters</u> that you MUST set, in order to make the G3020 to play with the software, is marked with an asterisc (*). ALL other settings are PERSONAL (or maybe for working SSB and/or other modes), and can be set by the user for convenience or amusement ;). Anyone may correct me if any detail or setting is wrong here. This document will be revised frequently.

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Main tag: General* Sub tag: Hardware Config*

 Genesis 59 Genesis G3020 Genesis G40 Genesis G80 Genesis G160 DR3X 	Genesis G3020 10,125000 * 14,045000 * 14,138000 * 14,232000 *	Display always on top Receive Only USB Si570 board

This window is pretty obvious. Select the radio model that you want to use. If you will use the G3020, enter the 4 LO-frequencys in the middle of the window. In the Hardware Setup section, confirm that Receive Only is disabled if you want to do more than just listen with your radio.

Main tag: General Sub tag: Options

Options	Proce	ess Priority	Auto Mute
Spur Reduction 🗖 G	isable Software No	rmal 💌	Enabled
Click Tune Offsets (Hz) DIGU: 1200 🚖 DIGL: 2210 —	Keyboard	Main Cons	ole

This window you can leave as it is...

Main tag: General Sub tag: Calibration

Freq Cal	Level Cal	RX Image Reject Cal
10,00000	Level (dBm): 70 ÷	10,0000
Start	Start	Start

I haven't touched anything in this window, because I'm not really sure about what may be the result of "experimenting". If you don't know what you're doing, leave it!

Main tag: General Sub tag: Filters

Filter Controls Max Filter Width (H2): 9999	a - Lacuesis contig	
Max Filter Shift (Hz): 9999 🛟		

In this window you can set the maximum filter widths and slider modes. I'm quite happy with the "factory settings" so I didn't do anything in this window.

Main tag: General* Sub tag: Genesis Config*

Port connection	- Si570 option	
Port: COM7 - USB option fffe VID 1970 PID	Si570 Xtal 114260800,00000 🛨 Divisor 11 🛨 Si570 address 85 🛨	

In the section named "Port Connection", you must select the number of the COM port for your USB/Serial adapter. This is the COM port that was generated when you installed the USB/Serial adapter, if you're not sure – go to the Windows control panel, select System > Device Manager > Ports. You will find the number of the COM port assigned for your USB/Serial adapter there.

Don't touch anything in the USB option section. Don't touch anything in the Si570 option section, unless you are using a Si570 together with your rig.

Main tag: Audio* Sub tag: Sound Card*

2.

Primary 5 Driver:	ound Card Setup Detail:	\$	Sound Lard Select		IQ correction
Diriver.	Тиме		Unsupported L	ard 🔳	0 📑
nput:	E-MU 0202 USB	-	Buffer Size	Line In Gain	
Output:	E-MU 0202 USB	•	2048 💌	20 🕂	Channels
Monitor:		•	Sample Bate	Mic In Gain	2 🔹
Mixer:	E-MU 020211158	•	96000 -	50	
	r				Latency (ms)
neceive.	1	*	Output Voltage	Mic Boost	Manual
Fransmit:	[*	1,00 🛨Tes	st Un	120 🚞
 Enat	nle VAC as Mic/Speaker	device	E BX swap 1/0		

The settings in this window are essential. If you're using the EMU-0202, you can "copy" the settings from the picture above. Sample rate is a matter of taste and I'm quite happy with 96 KHz, even if the 0202-card is capable of 192 KHz.

Main tag: Audio Sub tag: VAC

/irtual Audio Cable Setup Driver: MME	Sample Rate	
Dutput: Microsoft lydtilordning - Outpu	Mono/Stereo	

Don't touch! You should keep VAC disabled.

Main tag: Display Sub tag: N/A

Spectrum Grid Max: 0 Min: -140 Step: 10 Align: Auto V	Refresh Rates Main Display FPS: 15 Meter Delay (ms): 100 Peak Text (ms) 500 CPU Meter (ms) 1000	Phase Mode Num Pts: 1 Averaging Time (ms): 3	Scope Mode 00 ÷ Time (ms): Polyphase Ff 50 ÷	50 🔅
Vertical Grid	Low Color:	Driver Engine GDI+	Multimeter Analog Peak Hold (ms): Digital Peak Hold (ms): Average Time (ms):	1000 ÷ 500 ÷ 1000 ÷
Import DB		OK	Cancel A	pply

In this window you can play with a number of parameters regarding presentation in the display. Before experimenting with the settings, it may be a good idea to make a notation of the "factory settings".

Main tag: DSP Sub tag: Options

NR Taps: 50 🔅 Delay: 25 🔅 Gain: 25 🔅	ANF Taps: 65 🛟 Delay: 50 🛟 Gain: 50 🛟	Buffer Size 2048 v Window Hanning v	Noise Blanker Threshold: 20 ÷ Noise Blanker 2 Threshold: 15 ÷	
Block LMS	I BIOCK LMS			
I✓ Block LMS	L BIOCK LMS			

...and here you have possibility to optimize Noise Reduction and the Automatic Notch Filter.

4.

Main tag: DSP Sub tag: Image Reject

Receive Rejection Phase: 24,14 :		Transmit Rejection Phase: 21,00 + -400 -20 Gain: 4,00 + -500 -25	
Save data Calibrate band	Clear all data Clear band data	Save data Calibrate band	Clear all data
Calibr	ate all	Calibra	ite All

This window is containing two VERY useful functions in GSDR; Image Rejection Optimization in both RX and TX mode.

Very important: <u>Before andjusting anything</u> in the software; make sure that you have done the image rejection adjustment on your G3020/G40 properly. The procedure for this is described in the G40 pages on the Genesis site. If you are using the EMU-0202 sound card, it also a good idea to find the positions of the L and R knobs on the 0202 front panel which gives the best image rejection. On my EMU-0202, I find the best image rejection when the R-knob is 100% CCW and the L-knob is somewhere between 0930 and 10 o'clock...

Now, you are ready to optimize the image rejection in the software. Start with receive:

If you are using the G3020, start with 10 MHz. For receive rejection optimization, tune your "big radio" to 10.117,0 MHz, transmit a carrier into your dummy load and look at the spectrum in GSDR. If you have done image rejection adjustment properly when you assembled your G3020 you should see a small image on 10.133,0 MHz (typical 40dB lower, or better, than the desired signal on 10.117). Now move the Receive Phase slider until you find a "dip" of the image signal. Move the Receive Gain slider until you find the deepest dip. Continue with both sliders in smaller and smaller increments until the image signal has completely dissapeared into the noise. Then click the "Calibrate band" button, which saves the settings for 10 MHz. Then click "Apply" and "OK".CONTINUED ON NEXT PAGE >>>

Now continue with doing the same on 20 meters. Set your G3020 to the 20-meter LO of your choise. Set the correct LO and band in the GSDR software, click "Setup", "DSP" and "Image Reject" You only need to choose <u>one</u> of the LO frequencys, as your settings will affect the whole band. I work mostly CW, so I choosed the 14.045,0 LO. Don't forget to click "Calibrate band", "Apply" and "OK" when you're done!

Now, we're ready to optimize the **transmit** image rejection. Also in this case it's mandatory that you have done a proper adjustment in the hardware before start playing with the software.

Connect a dummy load to your G3020 and tune it to 10.117,0 MHz. Tune yout "big radio" to 10.133,0 MHz and click the "TUN" button in GSDR (located just below the "On" button). You will notice a weak transmit image when you listen on 10.133,0 MHz. In the same manner as we did in the receive image rejection, move the Transmit Phase and Gain sliders in GSDR in smaller and smaller increments, until you find the point were the transmit image is weakest. Click "Calibrate band", "Apply" and "OK" when you're done. Continue with doing the same on one of the LO's of 20 meters.

VERY IMPORTANT:

If you for whatever reason, needs to realign the image rejection in your hardware (i.e. the G3020 or G40), it's a good idea to reset all the image rejection values in GSDR to ZERO, before start adjusting it in the hardware. This cane be done by resetting the sliders to zero by hand, or by clicking the "Clear band data" button for each band, or clicking the "Clear all data" button once in GSDR/Setup/DSP/Image Rejection.

It's quite fun to play with these functions in GSDR, and you have the opportunity to experiment a lot. Remember, that you can't distroy anything by playing with the functions in the software. If you can't get back to proper adjustment values, just reset them in the software to zero. A proper image rejection adjustment made in the hardware is good enough in most cases.

Main tag: DSP Sub tag: Keyer

Freq: 600 T Port: None Semi Break In I Enabled Delay (ms): 400 T	▼ Iambic □ Disable Monitor □ Rev. Paddle □ High Res. □ Mode B	Weight: 50 🚖 Ramp (ms): 5 🚖

I haven't done anything in this tag...

Main tag: DSP Sub tag: AGC/ALC

AGC Slope (dB): 0: Max Gain (dB): 12: Attack (ms): 2: Decay (ms): 500: Hang (ms): 500: Hang Threshold:	Leveler ALC C Enabled Max.Gain (dB): 10 1 Attack Attack Ins): 2 1 Decay Decay (ms): 500 1 Hang (m Hang (ms): 500 1	(ms): 2 ÷ (ms): 10 ÷ ns): 500 ÷
Fixed Gain (dB): 20	, <u></u> , <u>_</u> ,	

Here you can optimize your AGC-settings. I haven't done anything here, as I'm quite happy with the "factory settings"...

Main tag: Transmit Sub tag: N/A

Conventional ▼ Save Delete Tune Power (W): 15 ÷ V0X ▼ Enabled Sensitivity: 90 ÷ Delay (ms): 200 ÷	Image: 12900 Low: 200 Noise Gate Enabled Threshold (dB): -40 Monitor TX AF: 50 AM Carrier Level: 100,0	Genesis option Image: Total Structure <
--	--	---

The settings here mostly affect SSB, which I haven't tried yet...

5.

6.

Main tag: PA Settings Sub tag: N/A

Gain By	Band (dB)	1	ADC Off	set (ADC bits)	Keyboard 1	12	
160m:	49,0 ÷ 20m:	48,3 🛟	160m:	107 ÷ 20m:	108 🛟		
80m:	48,0 ÷ 17m:	49,3 🛟	80m:	107 ÷ 17m:	108 🛟		
60m:	47,4 ÷ 15m:	48,1 🗧	60m:	107 ÷ 15m:	108 🛨		
40m:	46,9 ÷ 12m:	47,4 📫	40m:	106 ÷ 12m:	110 🗧		
30m:	48,9 ÷ 10m:	43,0 🛟	30m:	108 ÷ 10m:	111 🛨		
	et 100 -						
Targo Powe	er (W):						

No, I haven't touched anything here...

Main tag: Appearance Sub tag: Display

7.

Background: Text:	Cursor/Peak Readout Peak Text:	
Filter Color: Filter Color: Filter Color: TX Filter Color: Sub RX Color: Zero Line: Band Edge:		
1		

Here you can play with the colours in the software. Quite self-explaining...

Main tag: Appearance Sub tag: General

General Audio Display [Display General Meter])SP Transmit PA Settir	igs Appearance Keybo	pard Tests 0	CAT Control	
Button Selected:	VFO Inactive:	Band Data Inactive: Active: Out Of Band: Background:			
Import DB		ОК	Cancel	Apply	ĩ

Main tag: Appearance Sub tag: Meter

Meter Type: Edge	Original Style Left Color:	Edge Style
Digital Background:	Right Color: ■	High Color: Background: Indicator:

Main tag: Keyboard Sub tag: N/A

Tune Digit	x.00	0000	0.x0	00000	0.0x00	0.0 0.0	0x000 0.0	100x00	0.000	0x0	0.00	0000x	1	
Up:	Q	•	W	•	E	▼ B	▼ T	•	Y	•	U	•		
Down:	A	•	S	-	D	▼ F	▼ G	-	н	•	J	•		
Down:	N	•		Down:	V	•	Down:	z	-					
RIT Up:	0	•		XIT Up:	[•	CW Dot:	12	•					
Down:	1	•		Down	P	•	Dash:	1	•					

No, I haven't touched this... yet... ;)

9.

Main tag: Tests Sub tag: N/A

TX IMD Test Freq #1: 700 🛟 Freq #2: 1900 🛟	Impulse Test Impulse 20
Power: 50 ⋮ Start	Signal Generator Off • Input • Output 0 10k 20k Low: 0 • High: 4000 • Hz/Sec: 100 • Sweep
Import DR	OK Carcel Applu

Like I wrote on an earlier page; if you don't know what you're doing - don't do it...

10.

Main tag: CAT Control Sub tag: N/A

CAT Control	PTT Control	ID as: TS-2000 💌
Baud 1200	Port: COM7 💌	Test
Parity none 💌 Data 8 💌		
Stop 1		

You don't need to do anything in this window in order to get your G3020 to work properly. Leave it...