Software Setup and Calibration Guide

Section 1: Initial RX Setup

At this point you need to choose a software Program and install drivers for the USB. If you ever had a Softrock type radio connected to your computer then all you need to do is connect USB to computer and it should find drivers and connect OK. In device manager it should show up as softrock(I don't remember exactly). If not and to avoid issue with other radios like Peaberry/ Omnia/Multus radio then you should use Zadig.



When you first open without any drivers the left window near "Driver" will show something else. My computer already has the correct driver. In the right window choose libusb-win32(v1.2.6.0) and click install driver(again mine shows reinstall driver). In device manager it should show up as DG8SAQ-I2C.

Connect a stereo input cable to P2 jack. I will be using GSDR which works pretty well.

Go here <u>GSDR Down load</u> and download the file GSDR_Complete_install_package.zip. Extract this to your computer.

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.

E:\Users\n8vet\Documents\N8VET NAS\SDR Radios\The Veteran SDR\Production files Ver 2.2\Instructions\GSDR_Complet_Install_Package\fftw_wisdom	100	\times
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Wisdom file successfully opened		
Checking forward fft's up to 8192		
64 Forward		
128 Forward		
256 Forward		
512 Forward		
1024 Forward		
2048 Forward		
4096 Forward		
8192 Forward		
Checking inverse fft's up to 8192		
64 Backward		
128 Backward		
512 Backward		
1024 Backward		
2040 Dalkwaru		
		~







Unless you have one of these legacy sound cards, select "Unsupported Card" Next



You should now see this with a green USB Button. <u>Make sure you center</u> <u>the horizontal sliders below the red arrow.</u> The picture shows the default setting and will mess things up down the line.

Click on Setup in upper left corner.



General---Hardware Tab. Yours should look like this. In the QRP2000 box you will see CW1 and CW2. Sometime you may have to select the non default CW2 to make it work. I rarely see this but it does happen. Click on GET and you should se the number change to the stored value in the firmware. You can change the decimal numbers to calibrate the frequency.

Hardware Config	Ontione	Calibrati	on Filter	re Generie (onfia	repearance	neyboard	10000	0.
Radio Mode Gene Gene Gene Gene Gene Gene Gene Gene Gene Carre Carre Gene Carre Care Care Care Care Care Care Care	el esis 59 esis G302 esis G40 esis G40 esis G40 esis G102 esis G102 esis G103 esis G103 esis G104 esis G104	20 20 7 0	GRP2	S Genesis C 000 CW1 570 address 0 16c0 570 Xtal 11 Get uency multiplie lx 0 2x V options XTRV enable V Losc 14 Frequency 0 1x 0 2;	 ○ CW2 85 ÷ PID 05dc 4.186920 ÷ Set er ● 4x 000000.0 ÷ multiplier x ○ 4x 	Misc S A R Show D D N O O C B	etup utomatic for eceive Only SB Si570 b wHide F1 rag filters rag spectru ew VFO loc In Screen D ontinuous tr utton magni	cus y oard 10 ~ m ok isplay uning fier	

Tune up to WWV and you should be able to get it pretty close like this. The up/down arrows might be too course so you'll have to manually enter numbers for the last 3 digits or so.



Enjoy RX for a while then on to more building :)

If your still building the radio return to section 7 Filter switching Circuits of the Assembly Instructions

Section 2: RX Calibration

Frequency calibration has already been done. The next step is signal level and RX image adjustment.

For level adjustment you need a signal source of a know output. Mine is a -79dbm signal at 7.01mhz. Tune radio to that frequency and select Start in Level Cal box. Or you can manually do it by changing Smeter val and Display val numbers.

General	Audio	Display	DSP	Tran	ismit	PA Settings	ATU	settings	Appearance	Keyboard	Tests	C/ + +
Hardwar	re Config	Options	Calibr	ration	Filters	Genesis o	onfig					
		Level Cal						RX Ima	age Reject Cal			
		Frequen	cy:	7.01000	00 🚖				Reset	Save		
		Level (d	Bm):	-75				WBIR				
		SMeter		-34.00	00				Stop	Start		
		-82.62	21			TX	RX Time	2000	÷			
		Display	vui.	02.01					WBIR Fixed			
			Sta	rt				Ph	ase			
		Ca	libratio	n nrog				Ga	ain		1.1	
	Calibration progress							0	.00 🜲			
								S	ave band	Reset ban	d	
			Abo	ort					Save all	Reset all		

RX image adjustment is next. I have found that a fixed value works the best. Once you set one band you can use the same values for all bands.

The image is located under white arrow and completely suppressed after adjustment.



Genesis Radio	32bit v2.0.16												\times
Setup Wave	Equalizer	CWX	Voice Messages	Wizard	Compact screen	DX Cluster	XTRV	Debug	About				
On MON TUN MOX MUT PLAY REC	Display	A 401	7.010 00 M Extra CW	0'	VFO B 7. 40M Exi	010 00 tra CW	0	LOSC	7. <u>0</u> 00 oc	0	Signal -7	✓ Fwd 76.0 (7 9 +2	Pwr ∨ dBm
AF 20 	-45 -55 -65 -75 -85 -95 -105 -115 -125 -135 -135	6.960	6.970 huyupunnyuyku	6.980 hriturhnnh	6.990 7.1	000 7.0	10 /\\\\\\	7.020 11/11/14/1.	7.030 7.04	LO portMpdama	Band - HF 160 40 17 10 More VFO A Mo LSB WFM AM DIGL VFO A Filt 1.0k 600 250 25	80 30 15 6 WWV de - CW USB CW SAM DIGU er - 1.0k 800 500 100 Var 1	60 20 12 2 GEN DSB FMN SPEC DRM 750 400 50 Var 2
lise											Low 100 Width: J-	÷ High	1100 ‡
CPU %: 3.7						-71.3dBn	1	-67.1H	lz 6.999 933	MHz	Shitt:		Res
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In the WBIR box select Start button, check WBIR Fixed. Then adjust phase and gain as needed. Press Save all button to save settings to all bands.

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Hardwar	e Config	Options	Calibra	tion Filte	rs Genesis o	onfig				
		Level Cal				RX In	nage <mark>Reject Ca</mark> l			
		Frequen	cy: 7.	010000			Reset	Save		
		Level (d	Bm):	-79	-	WBI	2			
		CMatan		49 582			Stop	Start		
		Sivieter	val.	01.050		T	VRX Time	2000	+	
		Display	val.	81.956			WBIR Fixed			
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							5.69 -		0.1	
				3)			Save band	Reset ban	d	
			Abor	t			Save all	Reset all		

Section 3: TX Calibration

The first step is setting the your sound card Audio Output voltage. Connect a Volt meter using AC scale to sound card output cable. Tip or ring and shield. Press the test button

ieneral	Audio	Display	DSP	Iransmit	PA Settings	ATU settings	Appearance	Keyboard	lests	C/		
Sound Ca	ard V	AC Dig	gital VAC									
Primary	Soun	d Card Set	tup Details	S	Puffer Siz	204	0	Channels				
Model:	Ur	supported	Card	~	Course D	204	o ~	2	~	8		
					Sample R	ate 9600	0 ~	RX	TX			
Driver:	AS	610		~	Line In Ga	ain 2	20 🖨	• 1/2 ln	• 1/2	2 Out		
Inout			A 1:		Mic Gain	5	50 ≑	○ 3/4 In	0 3/4	4 Out		
mput.	AS	NO E-MU	Audio	~	Mic Boost		On	Ex.	access			
Output	AS	O E-MU	Audio	~	Au	dio Output Volt	age		O correc	tion		
					1.81	÷ T	est		Q CONCO			
Mixer:				× D	irect I/Q outp	The measured	VRMS on the	e sound car	d outpu	t when ou	tputtin	ng a full range t
Receiv	e:				Enable	Phas	e:	l	atency ((ms)		
	_				Q correcti	on 0.0		outrung -	Mar	ual		
Transn	nit:			~ [RX shift en	able Gain	:					
		QSK	🗌 On	F	RX shift 240	0.0			50	Ŧ		
	Enable	VAC as M	lic/Speak	er <mark>device</mark>	Line/Mi	c <mark>shared in</mark> put	RX swa	ap I/Q] TX swa	ap I/Q		

	General Au	dio Display	DSP	Transmit	PA Settings	ATU settings	Appearance	Keyboard	Tests	C/ + +
Calibrate Sound Card	× Card	VAC Dig	jital VAC							
	Abort II Input: Input: Output: Mixer: Receive: Transmit:	Unsupported ASIO ASIO E-MU / ASIO E-MU / ASIO E-MU / QSK able VAC as M	I Card Audio Audio	s	Buffer Size Sample Ra Line In Ga Mic Gain Mic Boost Auc 1.81 Irect I/Q output Enable IQ correctio RX shift ena RX shift ena RX shift ena RX shift ena RX shift ena RX shift ena	te 96000 n 2 5 iio Output Volta € T Phas n 0.00 bble Gain 0 € 0.00 c shared input	8 ↓ 0 ↓ 0 ↓ 0 ↓ 0 ↓ 0 ↓ 0 ↓ 0 ↓ 0	Channels 2 RX		2 Out 4 Out tion ms) ual \$

Record the voltage and press the abort button on pop up. Enter that voltage into the Audio Output Voltage window. This will ensure you have the proper range when adjusting the Power output on the PA tab.

ADC Offset (ADC bits)2190m 43.0 $20m$: \checkmark 48.3 $120m$: \checkmark 48.3 $2190m$ 60 $20m$: 60 60 $600m$: 43.0 $17m$: \checkmark 49.3 49.3 $60m$: 60 $17m$: 60 $60m$: 60 $17m$: 60 60 $80m$: 48.0 $12m$: \checkmark 47.4 48.1 $60m$: 60 $15m$: 60 60 $60m$: 60 $15m$: 60 60 $80m$: 47.4 $10m$: \checkmark 43.0 43.0 $60m$: 60 $10m$: 60 60 $60m$: 60 $60m$: 60 60 $30m$: \checkmark 48.9 $2m$: 43.0 43.0 $30m$: 60 $2m$: 60 $40m$: 60 $6m$: 60 60 Calibration progress	ieneral	Audio	Display	DSP	Transm	it P	'A Settings	ATU settings	Appea	rance	Keyboard	Tests	C/ 1	•
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Reconnect sound card output cable to radio. Connect SWR meter and dummy load to antenna jack.

Before you make any power, adjust all the gain by band numbers to 54 or higher to prevent over driving radio. The Amp will put out well over 10W.

Select TUN on the main page and set PWR slider to 100%. Adjust gain by band numbers for 10W output on each band. Lower numbers will result in more output power. Once this is complete we will move onto the TX image adjustment.

There are a couple of ways of determining the TX image. By using a second receiver, Spectrum analyzer or a device by Multus SDR called IQ Balance detector, IQBD.

Tune the radio to a frequency, lets use 7.01mhz. Make sure the LOSC is tuned 10khz away to 7.0mhz. This will place the TX image to a known point of 6.90mhz.



The TX circuit is well balanced and from the many builds I have completed TX image doesn't need adjustment right out of the box to meet FCC regulations. As you can see in the above picture the spurious signals meet FCC limits at 10W.

Lets go ahead and see how well we can suppress the TX Image.

While transmitting adjust Phase and gain to get the best rejection. As you can see very little adjustment was necessary.

General	Audio	Display	DSP	Transmit	PA Settings	ATU settings	Appearance	Keyboard	Tests	C/ + +	1
Options	Image	Reject	Keyer	AGC/ALC		-					1
				Transmit Phase -1.50 Gain: -1.14 Cali	Rejection -400 -2 -500 -2 Enable TX brate band eset band	200 0 20 250 0 25 (Imag Tone Calibrate Reset all	00 400 50 500				



This completes the calibration.