



NERG NEWS

North East Radio Group Inc
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Incorporated 1985 Victoria Reg No A0006776V
Affiliated with the WIA
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Contents

Page

- | | |
|----|--|
| 1 | Whats on this month |
| 2 | Modular 6cm Transverter Pt 2 – The Local Oscillator – Paul VK3DIP |
| 9 | NERG DX Awards |
| 11 | DXpeditions, Contests |
| 12 | Discounts, Remotes |
| 13 | Club info, Sponsors |

NERG Net

The NERG NET will be on non-meeting Thursday evenings on the VK3RMH 70cm repeater. That is 433.325MHz repeater input with 91.5Hz CTCSS. Set your receive frequency to 438.325MHz. 8:30pm. You can also use the 9700 remote to take part.

REMOTE STATION NEWS

Occasionally there is a power failure at the hall; usually the PCs re-boot automatically, sometimes they don't and so Someone has to manually reset them. If this occurs close to a Thursday then Someone usually waits till then to do this task. Therefore you may find the remotes unavailable after a power issue.

October 2024

WHAT'S ON THIS MONTH?

Monthly meeting

Thursday 10th October - 8PM

This meeting will be a Question & Answer session so if you have any questions about our great hobby come along and ask them. There are numerous people in the club who will be able to assist you and put you on the right track.

Every Thursday afternoon – Radio Café

At the hall – Commencing at 2:00pm

Come along and play with the radios, have a chat and a cuppa, bring your favourite nibbles.

Forth Tuesday of the month –

Gainfully Unemployed Group

Please let Jim know if you are coming to the next one on Tuesday 22nd October 2024

If you would like to be a member of the mailing list for this group please request membership on groups.io the group name is nerg-gug.

Kit Building and Testing plus Foundation Training and General Assessment Day

Saturday 26th October 2024

Training commences at 9am, if you would like to attend or undertake an assessment for any licence class please let us know at

vk3cne@gmail.com or

training@nerg.asn.au

Kit day starts around 10am lunch will be available.

Part 2 The Local Oscillator

By Paul McMahon VK3DIP

This time I concentrate on the 5.33GHz local oscillator, using a ADF4350 module and combinations of the filter and amp sections talked about last time. (Part 1 of this series appeared in the August edition of NERG News)

LO Multiply by 2 or by 3?

As mentioned last time I want to use a relatively cheap ADF4350 module as the basis of the local oscillator. Apart from the price, the ADF4350 has the advantages that I have used it before in a number of projects so I know how it works, plus it has the option of a 10MHz external reference in which is good for an accurate transverter.

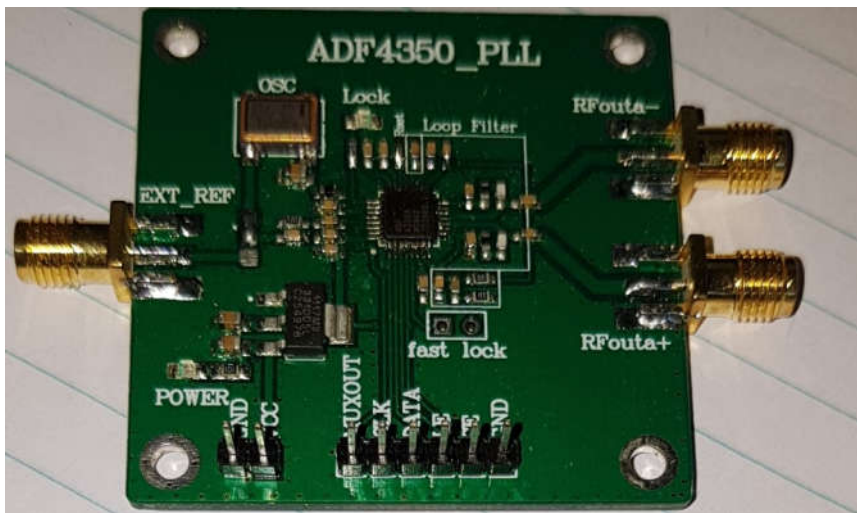


Figure 1- Typical ADF4350 Module

A typical example of a ADF4350 module is shown in Figure 1- Typical ADF4350 Module.

The only real problem with the ADF4350 module is that according to the data sheets it tops out at 4.4GHz and I want 5.33GHz here. So if 5.33GHz doesn't work then the alternatives are 1776.666 MHz multiplied by 3 or 2665MHz multiplied by 2. Obviously, the repeating fraction of the 1776.666 MHz makes super accuracy difficult. Using the AD design tool (Analog Devices ADF435x Software version 4.5.0) it is possible to set the channel spacing to say 300KHz and thus force a divide by 3 in the PLL chain but divide by 3 is often a problematic division ration if you want a clean result. So as mentioned last time the value I will most likely end up with is the 2665MHz by 2, i.e. doubled.

The first thing to check then is what level of Second (and Third) harmonics the ADF4350 produces. Some small tweaks to the PIC 12F629 code I have used previously to set the ADF4350 frequency gave me a version that was jumper programmable for either of the two frequencies (1776.666MHz or 2665MHz) at a couple of different levels.

First the by 2 version was tried at maximum power out with the result shown in Figure 2 - Second Harmonic High Power.

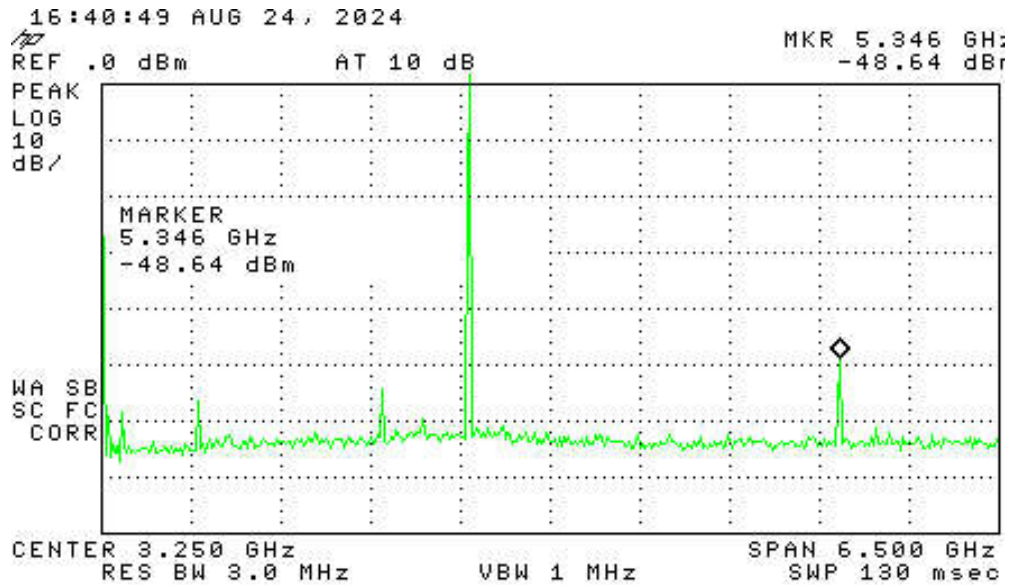


Figure 2 - Second Harmonic High Power.

The absolute values of frequency and levels shown are not perfect at this wide a span but give an idea that there is a reasonable level of 2nd Harmonic energy present at about 40 or so dB down from the fundamental. Just for completeness I also tried the 3rd Harmonic version also (Figure 3 - Third Harmonic Version).

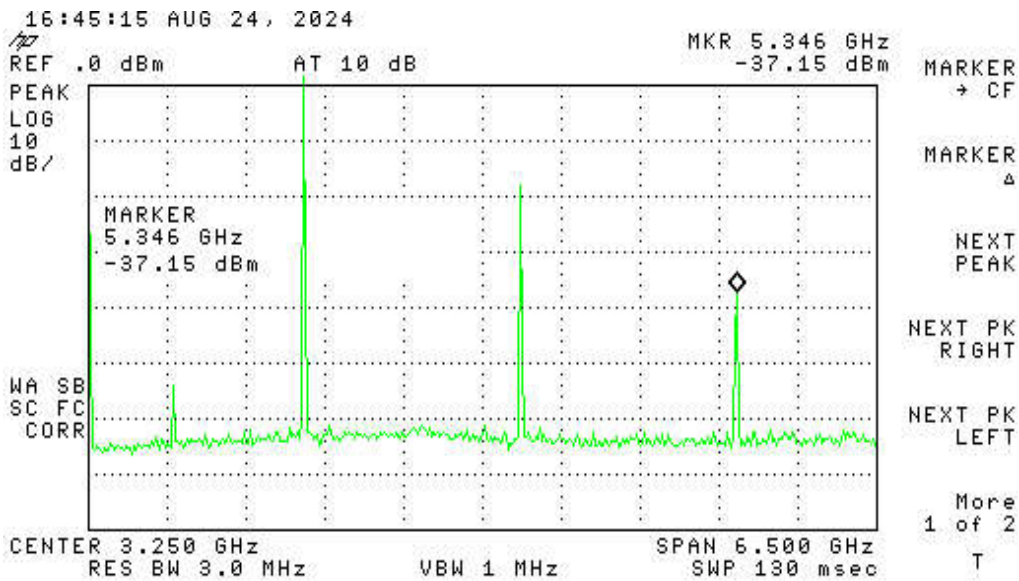


Figure 3 -Third Harmonic Version

The 3rd Harmonic version gave slightly more output at the 5330GHz frequency (about 35dB down on the fundamental) but even from this scan you can see it looks slightly wider, more on this later.

Amplifier Filter Stages.

The typical mixers I want to use require around +7dBm so now having an idea of how much gain and selectivity I needed it was time to make up another few amplifiers and filters to make it happen.

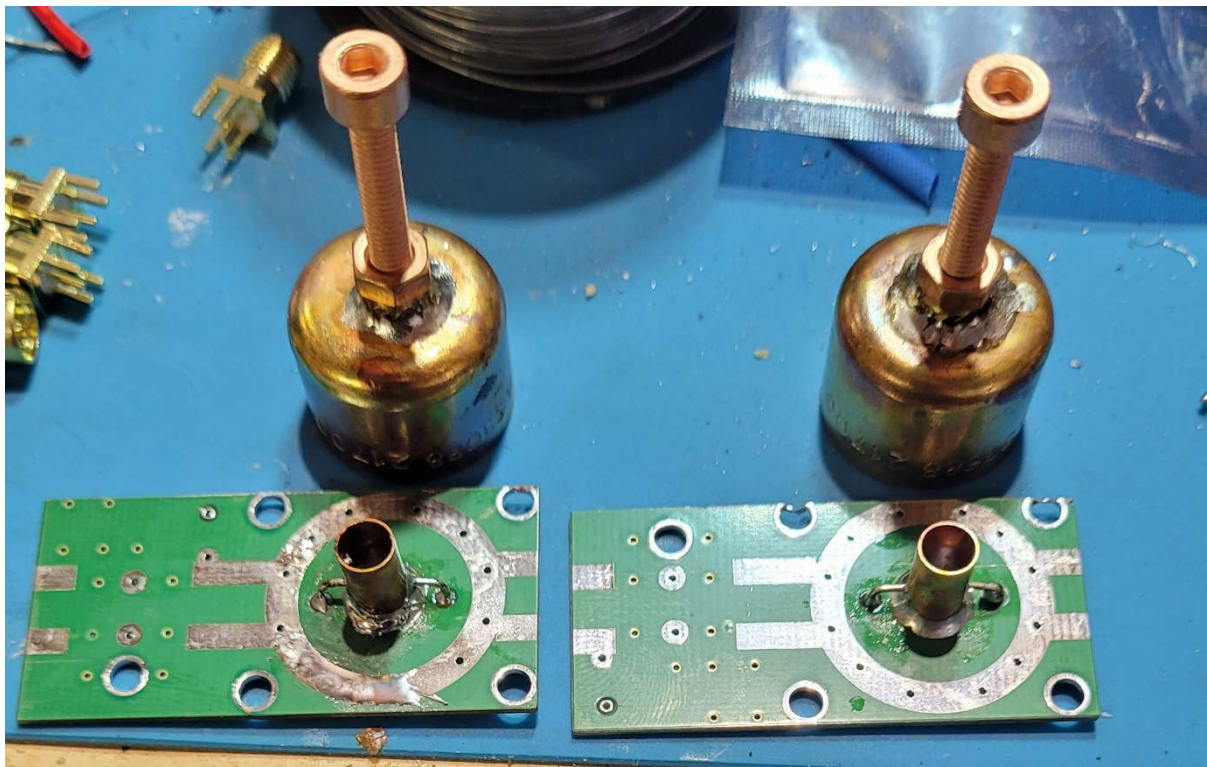
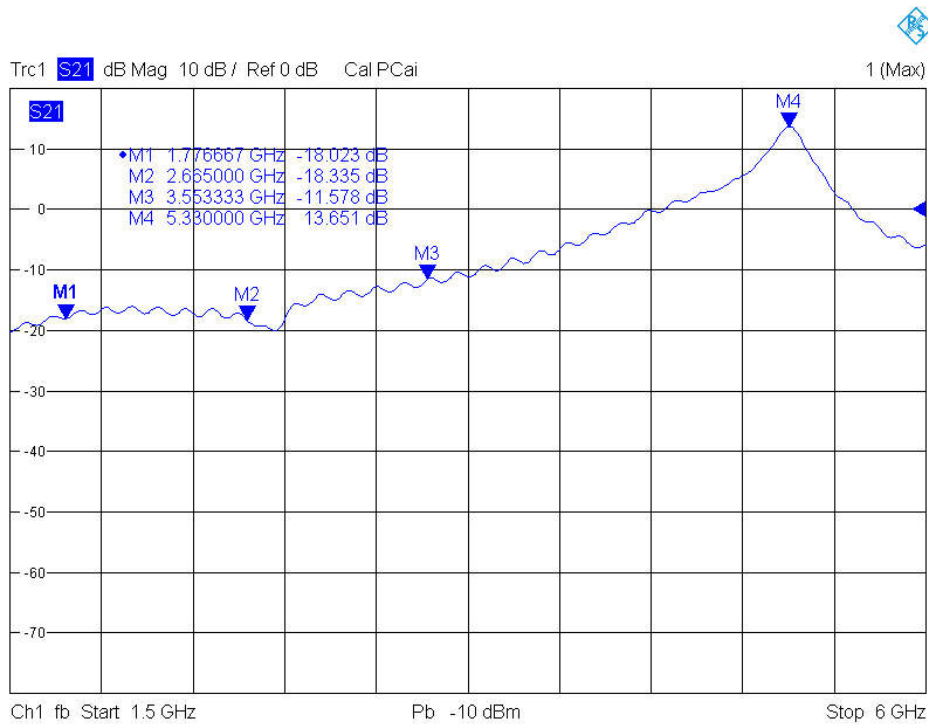


Figure 4- Amp Filter and Filter Amp Boards

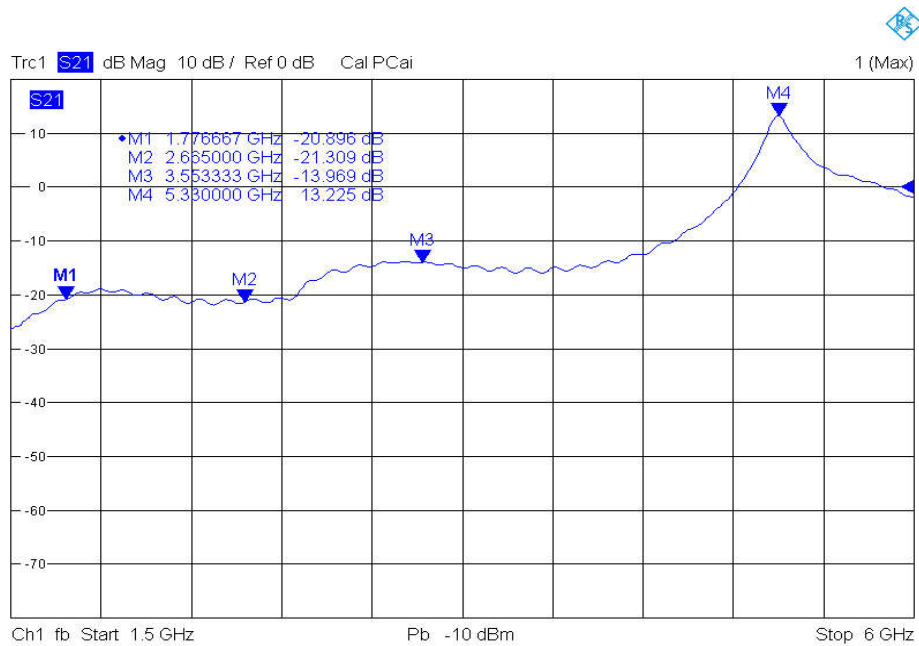
This time I just cut one of the test boards in half to basically make one board with an amplifier followed by a filter and one with a filter followed by an amplifier. Learning from the initial filter construction I drilled a fine (0.7mm using a PCB drill) hole straight through both sides of the inner copper quarter-wave 10mm down from the top for the taps which was then set at about 2.6mm above the PCB before soldering (giving the resonant element length of ~12.56mm). (see Figure 4- Amp Filter and Filter Amp Boards.) The values being calculated for a 5330MHz filter from the equations given last time. This time I just put one length of tinned wire through the tap holes and the PCB holes and then soldered the lot at once. Luckily, I had two of the good 20mm pipe caps left from my initial Bunnings purchases so once again the M4 threaded inserts were soldered through a 6mm hole in the cap top. As an aside, Bunnings (and many of the other local suppliers I have investigated so far) seem to have changed to a new brand of pipe caps which are too short for filter use, we can probably blame the price of copper. I am investigating other possible sources and styles including just cutting short lengths of copper pipe and using the shorter pipe caps or even an addition PCB for the top.

Once again I used the SBB4089 MMIC for the amplifier sections and under test the two new boards gave the responses shown in Figure 5- Filter Amp Response and Figure 6 - Amp Filter Response .



8/29/2024, 1:45 PM

Figure 5- Filter Amp Response



8/29/2024, 1:52 PM

Figure 6 - Amp Filter Response

The two responses are basically the same and like the combined result from last time. It does however make a difference what order the boards are combined as shown in the following two figures. Note an addition 10dB attenuator was put inline with the output in both cases to limit possible overload of the VNA. Figure 7 - Amp Filter Filter Amp is for the Amp, Filter, Filter, Amp, case and Figure 8 - Filter Amp Amp Filter is the Filter, Amp, Amp, Filter case.

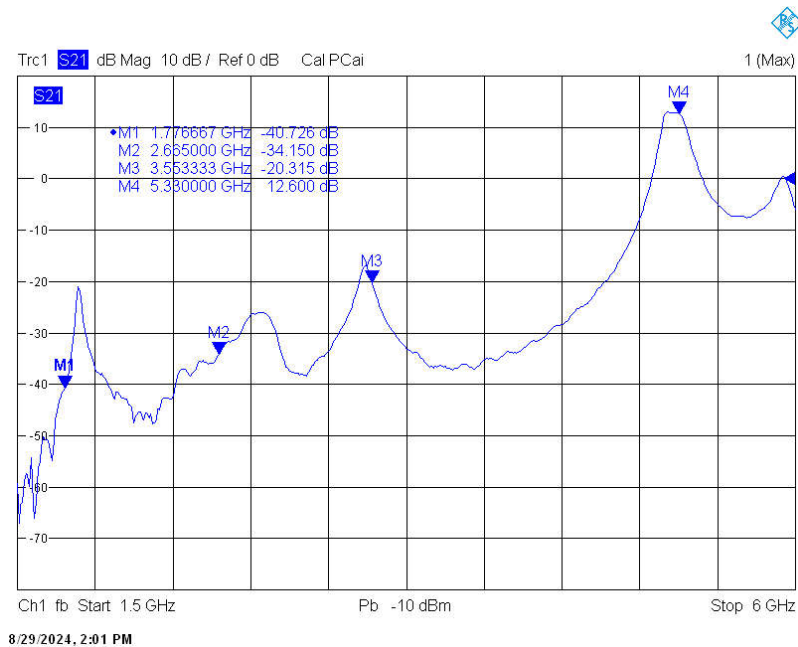


Figure 7 - Amp Filter Filter Amp

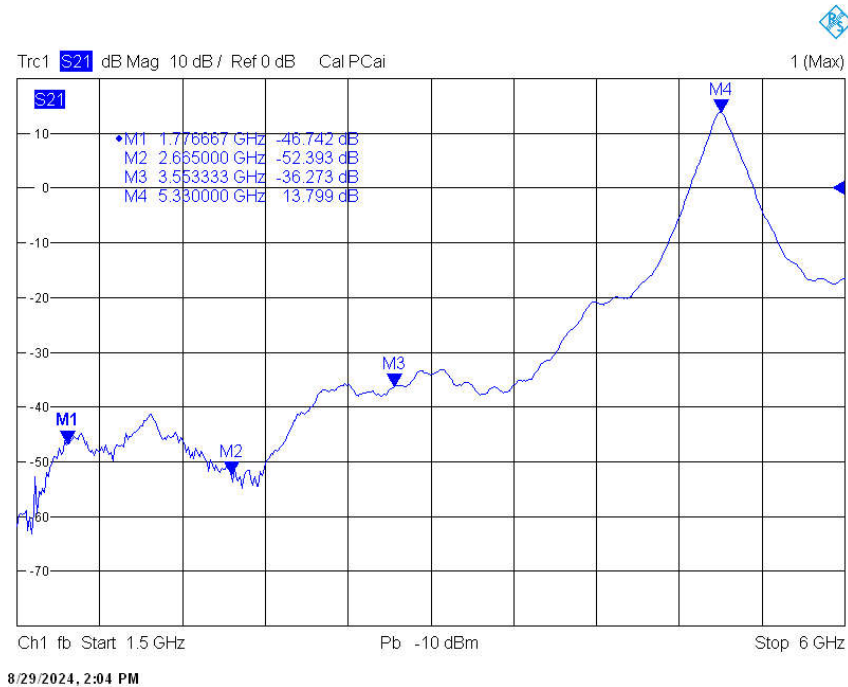


Figure 8 - Filter Amp Amp Filter

Obviously having the two filters directly following each other without amplifier isolation between them produces undesirable effects. I didn't try retuning the filters to see if the bad effects could be minimised as I wanted to have the blocks as a simple setup once type of thing.

As a final test I tried also adding in the amplifier and filter from part 1 making a Filter, Amp, Amp, Filter, Amp, Filter, see Figure 9 - Filter Amp Amp Filter Amp Filter. .

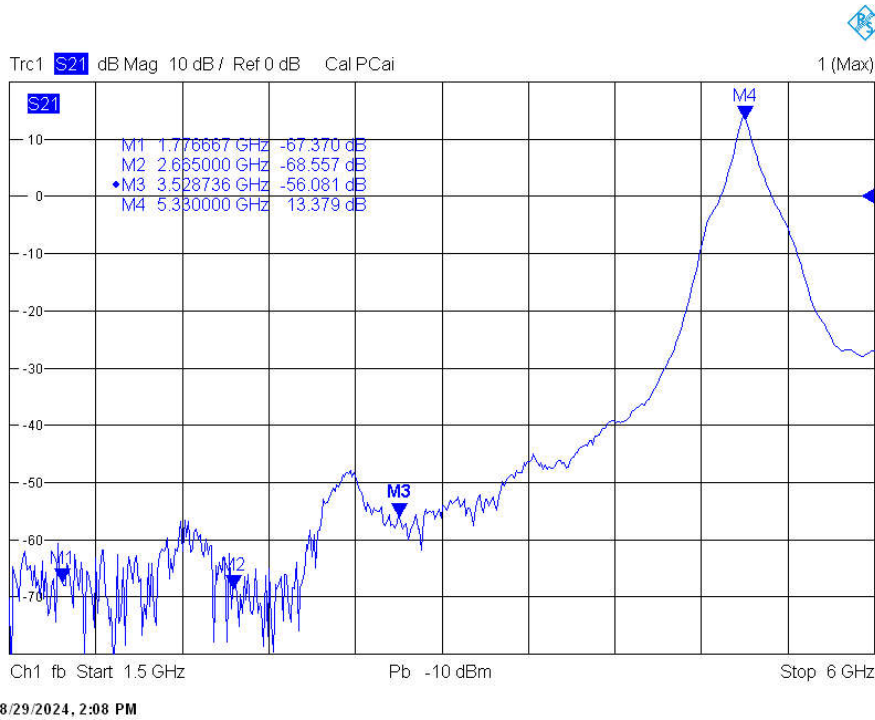


Figure 9 - Filter Amp Amp Filter Amp Filter.

As can be seen this configuration should be more than enough to amplify a clean LO signal at 5330MHz with considerable attenuation of either of the possible base ADF4350 frequencies.

Putting Them Together.

As a first attempt I tried the simple FAAF (Filter Amp Amp Filter) case with 2665MHz and got the result in Figure 10 - By 2 FAAF (10dB attn).

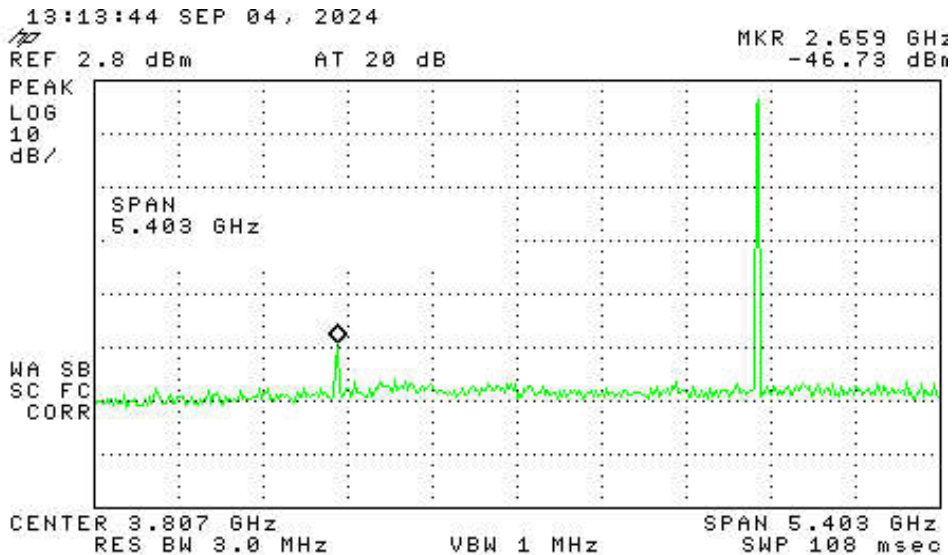


Figure 10 - By 2 FAAF (10dB attn)

This is pretty much the reverse of the initial position with now the ADF4350 fundamental being some 45dB down on the desired Harmonic. This is probably usable as is but adding a single Filter stage in the middle to form a FAFAF makes it cleaner as shown in Figure 11 - FAFAF by 2 20dB attn

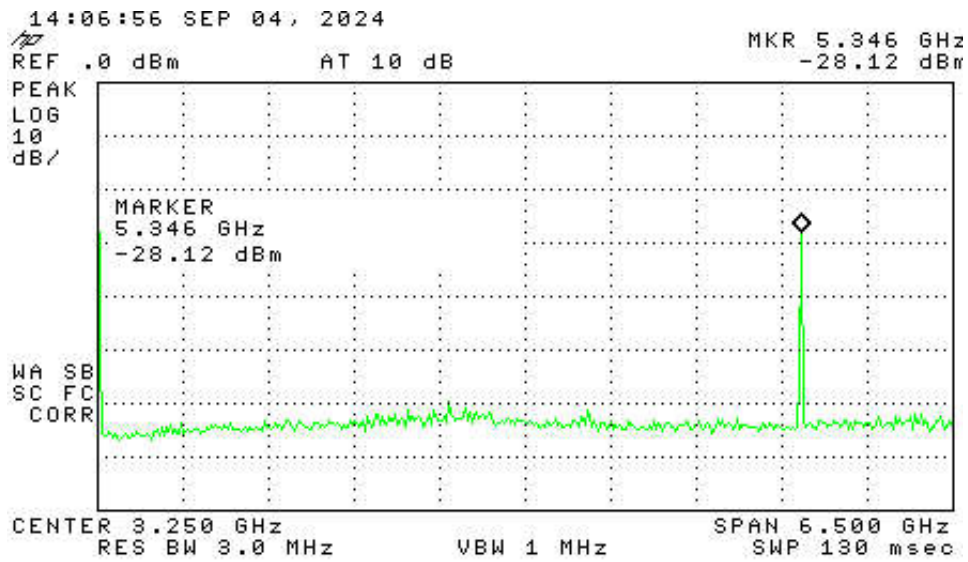


Figure 11 - FAFAF by 2 20dB attn

Zooming in a bit on the desired frequency we see the level is actually somewhat higher and the frequency is spot on. (see Figure 12 - FAFAF Zoomed in a bit..).

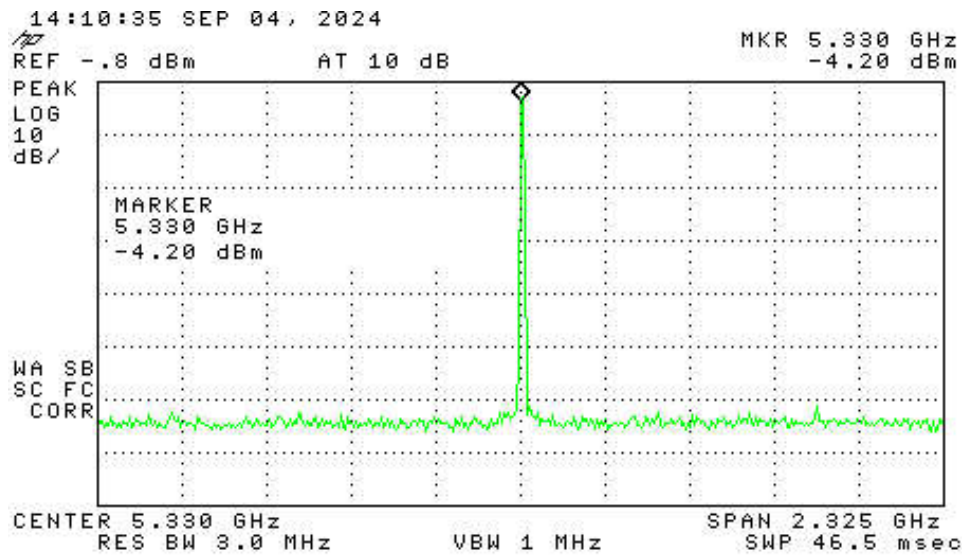


Figure 12 - FAFAF Zoomed in a bit.

We have to Zoom in quite a lot to start to see some noise at the base of the output. (Figure 13 - By 2 zoomed all the way in..)

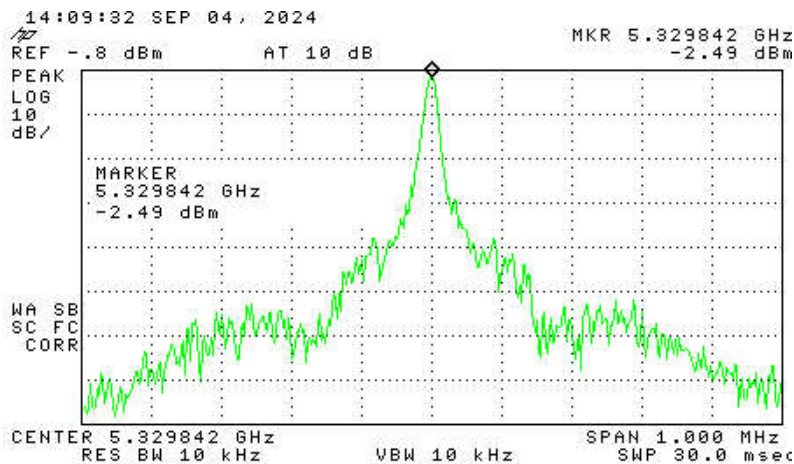


Figure 13 - By 2 zoomed all the way in.

In this case I would see this as reasonably good as I am not sure how much of the grot shown at the base is down to the LO and how much is the SA/bench noise due to the LO and Filter just sitting unshielded on the bench.

As has been said before the SA has not been calibrated for absolute levels for some years so the absolute level figure needs to be taken with a grain of salt. However as the SA does tell me that this is now a quite clean (i.e. monotonic) signal I can rely on a much more recently calibrated broadband power meter to tell the truth. In this case (with a 10dB attenuator that was tested to be good (i.e. 10.0 dB) at at least 6GHz) the NRPZ22 gave a figure of +2.83dBm out at 5330MHz , so allowing for the 10dB attenuator I am actually getting out +12.83 dBm at 5330GHz which is easily enough to drive a mixer, even if I ultimately want to put in a 3-6dB pad for matching.

Just to re-enforce that the by 3 multiple is probably not a good idea here is the zoomed in version of the scan for the by 3 case, see Figure 14 - By 3 Zoomed..

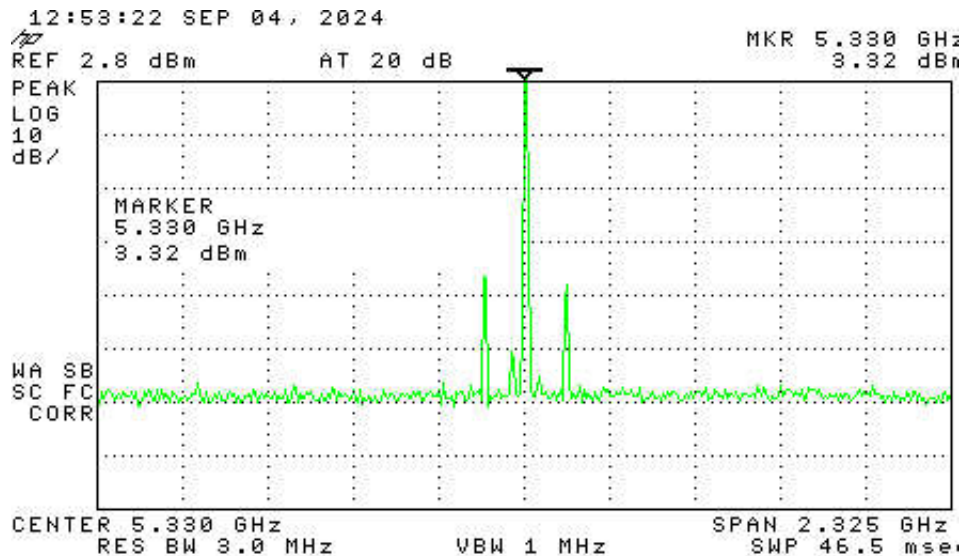


Figure 14 - By 3 Zoomed.

Those extra sidebands are too close to filter out and detract from the somewhat stronger main signal, and would possibly lead to birdies etc. in the final transverter.

Next Time.

Next time I will look at the mixer and possibly the switching given that the PCB's I am waiting on turn up before then.

73 Paul VK3DIP.

CLUB DX AWARDS

At the AGM a number of DX Awards were presented
EXTRA CLASS: 1st Luke VK3HJ, 2nd David VK3BDX and 3rd Lee VK3GK



Lee

STANDARD CLASS: 1st Place Simon VK3SIM, 2nd Chris VK3IK and 3rd Steve VK3KTT



Simon



Chris

&

WIRES CLASS: 1st Oscar VK3TX 2nd Mark VK3LV and 3rd Colin VK3ZLT



Oscar



Mark



Colin

FOUNDATION CLASS: 1st Peter VK3PCC, 2nd Dom VK3CIM & 3rd Craig VK3CWS



Peter



Craig

&

The place getters with no photos were not at the AGM and their awards are waiting for them at the club rooms. We congratulate all the recipients and encourage other club members to submit their logs to clublog and join the NERG on clublog to enter this competition. Chris has been looking at the rules for this competition and will announce some exciting changes shortly.

October 2024 PLANNED DXPEDITIONS

Some good DX coming up. The solar cycle is near its peak so get on the air and get your country count up. Remember the NERG is trying to improve on our 13th place in the world club ranking in the DX marathon, we need your score to help us.

Start	End	Entity	Callsign
Sep 19	Nov 12	Namibia	V51WH
Sep 29	Oct 14	Botswana	A25AO
Sep 30	Oct 11	Namibia	V55LA
Oct 01	Oct 12	St Kitts & Nevis	V4
Oct 03	Oct 10	Samoa	5W0TE
Oct 04	Oct 11	French Polynesia	FO
Oct 05	Oct 24	Fernando de Noronha	PX0FF
Oct 06	Oct 14	Maldives	8Q7UX
Oct 09	Oct 14	Svalbard	JW5X
Oct 09	Oct 23	Rwanda	9X2AW
Oct 09	Oct 27	Reunion	FR
Oct 10	Oct 29	Nauru	C21MM
Oct 10	Nov 11	Tanzania	5H3MB
Oct 11	Oct 14	Bermuda	VP9
Oct 11	Oct 18	French Polynesia	FO
Oct 11	Oct 20	Mariana Is	WH0RU
Oct 12	Nov 24	Guyana	8R1TM
Oct 15	Oct 31	Chatham Is	ZL7IO
Oct 16	Oct 30	Vanuatu	YJ0VV
Oct 17	Oct 23	Svalbard	JW
Oct 17	Oct 24	Mozambique	C91BV
Oct 18	Oct 23	French Polynesia	FO
Oct 20	Oct 25	Cayman Is	ZF2XX
Oct 22	Nov 05	Wake I	KH9
Oct 23	Nov 06	Jamaica	6Y
Oct 23	Nov 06	Madagascar	5R8
Oct 24	Nov 02	Malawi	7Q1
Oct 25	Nov 09	eSwatini	3DA0DL

Oct 31	Nov 11	Burkina Faso	XT2MD
Nov 01	Nov 15	Cocos Keeling	VK9CV
Nov 02	Nov 22	St Helena	ZD7
Nov 02	Nov 09	Maldives	8Q7TR
Nov 05	Nov 12	Cayman Is	ZF2KM
Nov 07	Nov 24	South Cook Is	E51SGC

Thanks to <http://www.ng3k.com/misc/adxo.html>

October 2024 CONTESTS

For CW operators this weekend sees the **Oceania Contest CW** on the 12th & 13th. Don't forget to include NERG as the clubname in your log. The last weekend in October sees the biggest phone contest of the year in the CQ WW Phone on the 26th and 27th this is a great contest to snag a few rare countries as a lot of operators visit exotic places. There are some excellent RTTY contests on too with the Makrothen and JARTS this month and the WAE in November N1MM+ is the logger for all of these.

Contest	Times & Dates
Makrothen RTTY Contest	0000Z-0800Z, Oct 12 and 1600Z-2400Z, Oct 12 and 0800Z-1600Z, Oct 13
Nevada QSO Party	0300Z, Oct 12 to 2100Z, Oct 13
Oceania DX Contest, CW	0600Z, Oct 12 to 0600Z, Oct 13
Scandinavian Activity Contest, SSB	1200Z, Oct 12 to 1200Z, Oct 13
Arizona QSO Party	1500Z, Oct 12 to 0500Z, Oct 13
Pennsylvania QSO Party	1600Z, Oct 12 to 0400Z, Oct 13 and 1300Z-2200Z, Oct 13
South Dakota QSO Party	1800Z, Oct 12 to 1800Z, Oct 13
UBA ON Contest, CW	0600Z-0900Z, Oct 13
YBDXPI FT8 Contest	0000Z, Oct 19 to 2359Z, Oct 20
ARRL EME Contest	0000Z, Oct 19 to 2359Z, Oct 20

JARTS WW RTTY Contest	0000Z, Oct 19 to 2400Z, Oct 20
10-10 Int. Fall Contest, CW	0001Z, Oct 19 to 2359Z, Oct 20
YLRD DX/NA YL Anniversary Contest	1400Z, Oct 19 to 0200Z, Oct 21
New York QSO Party	1400Z, Oct 19 to 0200Z, Oct 20
Stew Perry Topband Challenge	1500Z, Oct 19 to 1500Z, Oct 20
Worked All Germany Contest	1500Z, Oct 19 to 1459Z, Oct 20
Asia-Pacific Fall Sprint, CW	0000Z-0200Z, Oct 20
Illinois QSO Party	1700Z, Oct 20 to 0100Z, Oct 21
CQ Worldwide DX Contest, SSB	0000Z, Oct 26 to 2359Z, Oct 27
Ham Spirit Contest, CW	0600Z, Oct 26 to 0559Z, Oct 27
NOVEMBER	
ARRL Sweepstakes Contest, CW	2100Z, Nov 2 to 0300Z, Nov 4
EANET Sprint	0800Z-1200Z, Nov 3
High Speed Club CW Contest	1400Z-1700Z, Nov 3
WAE DX Contest, RTTY	0000Z, Nov 9 to 2359Z, Nov 10
10-10 Int. Fall Contest, Digital	0001Z, Nov 9 to 2359Z, Nov 10
JIDX Phone Contest	0700Z, Nov 9 to 1300Z, Nov 10
OK/OM DX Contest, CW	1200Z, Nov 9 to 1200Z, Nov 10
ARRL EME Contest	0000Z, Nov 16 to 2359Z, Nov 17
LZ DX Contest	1200Z, Nov 16 to 1200Z, Nov 17
South American Integration Contest CW	1800Z, Nov 16 to 2100Z, Nov 17

Many thanks to

<http://www.contestcalendar.com/contestcal.html>

Discounts from Suppliers

Club members can get discounts from two suppliers:

Altronics. (Australia Wide), Mention you are from the North East Radio Group or give our customer no - 64429. Discount will be minus 10% up to 45% off depending on the item. (Actual discounts depend on the product type and quantity purchased). There is No Minimum Spend in store to receive the discount. For on-line or phone Sales there **IS** a Minimum spend of \$25.00 inc GST but **NOT** including Freight. In the comments section put "64429" to receive the discount.

We have discovered that David VK3UQ gets an email, that you may not get, detailing delivery of your order. So pop him an email when you order and he will be able to track which email belongs to you. We hope to have a method of dealing with this soon. President at nerg.asn.au

Jaycar Electronics stores by mentioning you are from the "NERG" no spaces quotes or dots etc, Account code is 44700493. You need to spend a min \$25.00 to receive a 10% discount. [http://www.jaycar.com.au/](http://www.jaycar.com.au)



Can be used for receive on all HF bands. Provides transmit on 160 metres using a dipole, 80 and 40 metres using a trapped dipole and a Spiderbeam for 20 through 10 metres.

This is available to members, you will need:

- An Amateur Radio Licence – any grade – Remember you can only use the bands and power you are licenced to use.
- A windows computer with sound card connected to a speaker and a microphone. A PC headset is ideal.
- OR an android tablet or phone and are prepared to pay for the app (less than \$20)
- Download the client from RemoteHams.com install it on your machine and register with RemoteHams.com using your **callsign**. The

android app is called RCForb and is available on google play.

- The NERG station is “VK3CNE” Connect to it and request “club” membership and TX capability. Then wait until your membership is approved and away you go!
- Usage privileges are only available to financial NERG members with VK callsigns.

VHF / UHF Remote



The VHF/UHF remote operates exactly the same as the HF version, the Station is “VK3CNE – 9700”

About the NERG

The NERG Inc. Reg No A0006776V <http://nerg.asn.au> The North East Radio Group, Inc. is an amateur radio club devoted to encouraging members and others to enjoy the hobby of amateur radio. It tries not to hang on ceremony and endless reporting but rather participate in the fun aspects of this fascinating hobby.

MEMBERSHIP FEES

Due in August: Full: \$35 Family: \$50 Remote Member: \$50 Concession: \$25 You will get a renewal notice please wait for this before you pay.

COMMITTEE

President	Anthony VK3YH/BNR
Vice President	Greg VK3VT
Secretary	Peter VK3PCC
Treasurer	Mick VK3PRR

Committee Members

Mark VK3BYY	Ash VK3HAG
Phil VK3RP/BOY	Chris VK3IK/AWG
David VK3UQ	

NERG NEWS ARTICLES

The NERG is always happy to receive news, articles, and member's wanted or for sale advertisements for inclusion in the newsletter. Please contact the editor at news@nerg.asn.au

NETS

NERG NETS run on the club's 70cm repeater VK3RMH TX 438.325MHz and RX 433.325MHz both C4FM and analogue. **That means you RX on 438.325MHz and TX on 433.325MHz.** You will need a 91.5Hz CTCSS tone on your analogue FM TX and if you don't want to be bothered with listening to the C4FM digital signals on the output then set your radio to 91.5Hz CTCSS tone on RX as well.

(8.30 – 9.30 pm Non-meeting Thursdays). Feel free to join the discussions.

146.575MHz is used as a general Net frequency by a number of NERG Members and is often used by the DX chasers in the club while hunting DX. Foxhunters use this channel for liaison as well on the third Friday of the month.

Club Sponsor



Margherita Pizza ph 9434 4980

89 Main Road, Lower Plenty, Vic 3093

web www.margherita.com.au

Margherita's Still Sponsor the NERG and provide the excellent suppers that we have come to enjoy. Order your next Pizza dinner from them and tell them you appreciate their support of the club.

Facebook

The NERG is on Facebook – A group has been established and can be found at

<https://www.facebook.com/groups/nergamateur/>

Members are encouraged to join this group