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In dit nummer o.a.: "137 MHz Voorversterker • Weersatellieten in Vietnam deel 15 • PGA103 LNA • En nog veel meer.....



Dear member,

This pdf contains some translated articles of our Dutch magazine “De Kunstmaan”.

Google Translate is used; none or very few corrections are done afterwards. Results may be sometimes incorrect or hard to understand, but mostly I think it is usable.

Figures and pictures are partly left out. Please use the “paper” (Dutch) magazine together with these translations.

I hope these translations will help you to understand the Dutch articles.

Please check also our web-site, which has now a translated version:

www.kunstmanen.net

(middle of home page, “English version”).

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Before you is the first issue of The Kunstmaan this year in a new lay - out. We are very pleased that we are able to bring out the Kunstmaan A4 without increasing costs.

See you on the Satellite recent years, decades, you see what quality is orgevoerd do. In the beginning, the texts are written on the typewriter. The published photos looked rather out. With the advent of laser and deskjet printers, the quality went up. In 2000 the Kunstmaan got a color cover and middenvel was also in color, the photos posted on here. Ten years later, in 2010, the Kunstmaan is completely gone in color. And now in 2015 A4 size!

This format has a lot of advantages. The font in the old satellites was small and therefore sometimes difficult to read. In the A4, we have now chosen 10 point Arial. Diagrams of circuits can be shown at actual size.

The order of the items is also adjusted. In the beginning, the technical articles, followed by articles on the association. The valve is the satellite status. So we think that you know how to find your way quickly into the Kunstmaan.

As you can see in the figures, we have the year 2014 closed with a small loss. The budget for 2015 looks worrisome off. The cost of shipping the Kunstmaan will rise. The transition from A4 or A5 has no influence on this, because the weight of the new artificial satellite is not greater.

In the short term this loss no problems, but we should see if we can bend the line of rising losses. Suggestions from the members we want to hear.

Yesterday we had a nice meeting where I have to use the RTL dongle ge the monstreerd to receive the Meteor. This is kinde r truly easy to receive pictures that are not much less than HRPT quality.

At the meetings has already mentioned a number of times: July 2 is planned a visit to EUMETSAT in Darmstadt. Probably will visit on Friday ESOC (Mission control center) can be accommodated. Our friends GEO organize this for the third time and we are very happy that we hereby allowed to connect. If you are interested to join, enter it on the board. When more information becomes available we will pass this on, probably by mail.

The next meeting is the Annual General Meeting on 2 May. Due to holidays this earlier than usual. Have fun reading this Kunstmaan.

I was this summer especially busy with my motorbike. That is of Vietnamese quality. After extensive considerations, I decided to look ahead to perform. New but mostly a series of adjustments to the existing round. There is a lot of time to sit down but the final result is reasonable. I'll stick to look around but not fanatical.

Through all these activities, there is not much done to the weather satellites. Yet an update.

By Hai, my regular welder is a side piece welded to the existing standard, where the totem pole-rotor fits.

Visitors have taken transistors for the interface to the rotors from the Netherlands. I can make the solder station hot.. The problem is that my old two-channel oscilloscope, I've bought via Marketplace is to the eternal electronic hunting grounds. Only the backlight still works. So when problems in built circuit I have a problem. I have got a scoop, you can connect to a PC in order. They sell them in Vietnam in one case in Hanoi, but then I lost almost double what I pay if I order it in England. Now fingers crossed that he actually gets here. Next time more.

Dimension-4

I have on my PC weather satellites in a while the Chronos program run at regular times, the internal clock is set equal to a whole series of servers. The disadvantage of this freeware program is that frequent the web browser start-up to demonstrate the program website (and recommend the paid version on). I suppressed or again with a script, but remains annoying. Meanwhile I have after a hint on the astro forum.

Dimension-4 downloaded from

<http://www.thinkman.com/dimension4/>

This works perfectly and I immediately got rid of the annoying popup screens. You can also view the history: a graph with defects. For me that well within the 0.5 sec.

Everything

Space and astronomy

2017 test flight SLS / Orion, and in 2021 the first astronauts into space. Nice movie including flight simulation.

http://www.astromart.com/news/news.asp?news_id=1421

Reliable forecasts

On <http://www.astroforum.nl/showthread.php/154537-Waar-is-een-betrouwbare-quot-wolkenverwachting-quot-te-vinden?p=657797#post657797> is found with a lot of links on which site the most reliable cloud is expected to be found an extensive discussion. Who makes a program based on MSG recordings?

Using a GPS module (2) Fred van den Bosch

Summary

This article Describes my experiences with building a GPS receiver with some Arduino modules. A couple of programs for plotting a radio horizon have been tested and the overdeveloped workaround is Explained.

Introduction

Because making a radio horizon for a long time on my ToDo list, but with an existing program by David Taylor (SatCover), the article talked about using a GPS module Ben Schellekens [1] me . I describe my experiences and give some additional information, a part has been in consultation with Ben.

Building

The GPS module just appeared here in Nha Trang for sale. I have to build mainly held article of Ben and had half a day messing around a working receiver + Arduino sketch, which gives information on a four-line display. The layout on the screen, I have adapted to my own wishes. See the picture where my coordinates for privacy reasons have been replaced by those of my (once) favorite terrace on the boulevard of Nha Trang. OK, the height is not correct, the terrace on the seafront. The receiver works very well: I received already 3-8 satellites the receiver into the office. That made the testing easier. Before installing the receiver I used just like Ben PVC pipe: enough in stock and easy to handle. Because there is a 4-wire cable from the old station ran downstairs, I demolished the plugs from the old station and that used to sluiiten the cable. The antenna is mounted on the roof. See the picture.

U-center

Also my first tests were conducted with u-center. A very nice program, which lets you quickly see whether the receiver does what. In the icon bar showing the correct com port and the right speed and voila, you will immediately see how many satellites you can receive, what they are, where they are and how strong the signal is.

I use V8.13. There still appears to be in something of a fault. One of the options is a histogram display. Within this screen is a huge choice of what you want to see. So I just looked at a range of options. To the system with the message "out of memory" came and stuck. The big problem is that you do not come out here. Even delete the program, CcCleaner registry cleaning and again reinstall did not help. So somewhere there is apparently still retained something. On my mail to the support department has not responded. So use this option sparingly.

GPS Sky

As stated in the article [1] has already been noted by Ben, Sky GPS does not work under Windows7-64 bit. Am running it under Windows XP. When I proved myself tried a W7-32-bit machine, the program only works with 4800 baud (and the receiver at 9600 baud). I've got an email to bold, but this author has had heard nothing from him. So the Python script but copied and tried or that option would work. That turned out to be at best: it is actually a complete programming language. And to make it all the error messages "just" fix

GpsHorizon

But then the site of David Taylor tried. There I found, besides a lot of information about GPS and measurement (see NTP pages), also the program GpsHorizon [2], which should do the

same as GPS Sky. And since I'm lazy ... After entering the setup values 9600, 8, 1, none, hardware, and the correct COM port began to flood the information. Success! Beautiful, first other matters. When I opstarte program again, nothing happened. I then tried it in many different ways in various compatibility modes but no, I was not stable with respect to boot him. It is also one of the non-supported programs and more than 7 years old. Why I have not tried but if it could be adjusted.

Ultimately, the program proved -sometimes after hours wait- occasionally something to win and plot, but you never knew when. I have also only a few lines on the screen, and not a complete jobs. Even that option but I have so specified.

Workaround

The Python script is used to read the special "\$ GPGSV" records directly from the serial port. So I checked first if you center that can write off. That is possible, by using the recording function. In a short test output was shown that for every 4 "\$ GPGSV" records there are 5 other are written. OK, a "little bit" overhead, which had then: GPS Sky ignores common. The final file after 24 hours was approximately 47 Mb.

A second and much bigger problem was that GPS Sky alone in a cmd window can work and then only in full-screen mode. And unfortunately, from Windows Vista has that option anymore. Be a set of solutions on the internet, given that not all turned out in practice to work in conjunction with GPS Sky. Complete black screens, system with the on / off button again startup, etc. Not fun. Until I found somewhere DOSBOX. And that turned out the solution.

The workaround I have tested 7 32-bit on a system running Windows. Whether it with another O.S. work I do not dare to say but expect it at all.

- Download: GPS Sky (see article Ben) and take that in, say, C: \ GPS Sky..
- Download: DOSBOX of <http://www.dosbox.com/download.php?main=1> and install it.
- Start-up Center, click on record and give the file a name.
- Allow 24 hours walk.
- Copy / move the created file to c: \ GPS Sky and rename it to NMEA.LOG
- Start DOSBOX on. You now see as drive Z.
- Type: mount c C: \ GPS Sky \
- Type: c:
- Type: GPS_Sky.exe and <enter>
- Type: L. The data is plotted. This took me ehheh, anyway (much) more than an hour: I missed the moment the plot was ready.
- After plotting there is an image as picture 3.
- After any key displays a polar view. See picture 4. CAUTION. If you have a recording of this will have to use Alt / PrtScr and then import them into a photo program. IrfanView is very suitable for this purpose. Otherwise, the wait time for a heeele the picture is rebuilt.
- After you get any key you have the opportunity to write a .bmp. Unfortunately, only the first image and not to the polar view. Also be created two Excel files, where I (still) have done nothing with it.

Suddenly

I found the signal strength on the plots initially in some places quite surprising in the sense that I expected since higher signal strengths, especially in the west. But when I saw my picture of the antenna and I knew: the pillar shields the signal. The "holes" at the bottom are the hills around me. But according to the chart I have less than bothered by thought. The worst point is to the west at about 8 gr. With a protractor, I had the idea that they were higher. OK, so lucky. We shall see in due course as the HRPT antenna is ready (ehh .. and everything works properly).

Serial ports

I actually want to create multiple programs simultaneously from the GPS use. However, a port can only be used by one program at a time. Here, the Virtual Serial Ports Emulator (VSPE) outcome [3]. This ensures that access multiple programs simultaneously one serial port. For 32-bit systems, it is freeware, for 64 bits will cost \$ 25. On my PC satellite state W7-32 bit, so I'm ready to bargain. W7-32 actually was once a faulty installation: 64 bits must be. Now a fluke.

Meanwhile you hang ao-center, wxtoimg, WXtrack and GpsHorizon through VSPE (virtual COM 10) to the GPS receiver (original COM 8). However, pay attention when creating the virtual port. You must first enter the number of the virtual port, and link with an existing com port. I noticed that I had a tendency to do the opposite.

The Help under "Usage tips and scenarios" a comprehensive story of how the program can be started automatically with the correct configuration file. PAY ATTENTION. Before this parameter is not a "-" sign.

To ensure that first start the emulator and then the other programs (for using the virtual port) I use a startup delay program. Anyone can google a search program that pleases. After installation, there will be some fine-tuning must record found in the boot sequence and delays.

At the time of writing the program at start-up was not yet completely stable. Sometimes the config file was read well and sometimes not. Until now, I still can not find the cause, so I check every now and then whether the program is working properly. The problem is always the GPS and never again my programs, so something less important to me. Nevertheless, still a great program: an absolute must.

Sync PC clock

Now there is still a GPS receiver hangs on my system, but I wanted to immediately leave the PC clock to adjust. That was disappointing. I was looking for freeware, because I've already run a program (Dimension 4) that works well.

Unfortunately, there appear to be few freeware sync programs. I have long sought and a few tried, but that did not go beyond the highest COM 4. And I have mine put in Serial Ports COM 10 to have no conflicts with other programs. For now I do nothing but just in that direction. But if someone has recommended I love me a good suggestion.

Various programs

Finally I attached a number of programs to the GPS.

WXtrack

Here under setup using the GPS latitude and longitude are found. Any height is not accepted. Also, the PC-time can be adjusted. This seems like a one-time action, and as far as I can tell, are not automated.

Wxtoimg

Here is the same under Options | Ground Station: latitude, longitude and adjust the PC time. Following a question on the forum wxtoimg Craig gave some hints: Actually, it only works on XP, but possibly also higher, but WXtolmg must be run as administrator. You can test it by putting the time and lat / long to a different value.

No sooner said than done. And unfortunately, it does not work. I got an error message that the (virtual) port could not be opened. Because lat / long already filled out, I do not have time to further more spent.

Digital Atmosphere

Alas! This program can unfortunately only use COM 1 to 4 COM. And my GPS hangs on a gate with a higher number. A new program has been a few years in the making, but I did not get the impression that it will appear shortly.

Conclusions

The article by Ben in his hand and a little Arduino knowledge to carry out a very good and fun project. Making a radio horizon is given with the workaround to do well. Using Python is thereby not necessary. To make even better use of the GPS receiver VSPE is a very useful extension. To automatically update the time using the GPS solution needs to be found. For now that is still carried out by Dimension 4 [4].

Left

[1] Using a GPS module, the Kunstmaan July 2014, p. 76

[2] <http://www.satsignal.eu/software/mapping.htm#MapToGeo>

[3] <http://www.eterlogic.com/Products.VSPE.html>

[4] Weather Satellites in Vietnam, The Kunstmaan October 2014, p. 103

ARDUKMOTO X/Y ROTOR PROJECT -- STATUS UPDATE

Harry H. Arends

Since 2012 we are working on the development of an XY control to rotor using a parabolic antenna to track polar satellites. It is a combined project, ie a piece of hardware is developed and simultaneously a piece of software to manage everything in the right jobs. In this article you informed of developments and the position thereof.

Hardware

At the moment we are working on two systems, namely a version with DC motors and stepper motors with a performance. The version with DC motors is owned by Peter Smits. He has at various meetings already show some prototypes. These vary in material choices, from aluminum to stainless steel.

At this time, tests are performed to be able to interpret the pulse encoder used by the transmitted signals in a correct manner. Peter Smits will be given under-support of Ben Schellekens. Ben currently has a working arrangement with the old controller developed by Harrie van Deursen.

It is the intention that both systems are controlled by a to-Arduino that the information from a computer system to send signals in turnover ultimately will control the motors. At this time there is still no definitive configuration is composed for both systems. Also, the method of data transfer between computer and the Arduino is not yet known. It looks at a cable and a wireless system. Both systems have their advantages and disadvantages. On the last session, you can see a setup with Arduino receives the data wirelessly.

Software

Eea to lead in the right direction, information is needed. For this, Rob Alblasconcert has expanded Xtrack program developed by him with a portion that performs the necessary calculations and it via a USB communication

port to the rotor system is piped. This section, like the rest of the program, various setting options to customize it to suit your personal requirements. It should be given to the location, the rotor system used and the amount of information which is produced.

Your author has taken on the task of developing the software for the Arduino. This system makes use of a ATmega328 and standardized programming environment. This has been described in several articles in The Kunstmaan. The Arduino ensures that the information from the Xtrack program is converted into signals for controlling the motors. In the system with DC motors are also the pulses coming from the pulse generator incorporated in the motor to be able to determine the position of the antenna. In the system with the stepper motors of the extreme positions of the antenna are detected in order to avoid accidents, as the antenna turns too far.

As a continuation of this article, the various parts of the system will be published. The first two articles explain the basic operation of the ArduKMoto program and the basic hardware for the stepper motors.

In an earlier article has already discussed the hardware DC motors, but there is an updated sequel article. Depending on the test results of the two systems is then described the detailed operation of the ArduKMoto program. For support during construction has been set up a discussion group YAHOO.

These can be found at:

<http://groups.yahoo.com/ardukmoto>

Or use the following QR code:



Two Ethernet connections with one cable

Summary.

A description of using a single Ethernet cable for 2 separate 100Mbps connections.

Rob Alblas

With the new EUMETCast-service (DVB-S2, which was previously DVB-S) is a different type of receiver required. Sufficed formerly a cheap DVB-S standard satellite TV receiver, now is a much more complex and therefore require expensive receiver. There are different types: plug-in cards, loose receivers must be connected via USB and receivers have an ethernet connection. Of the latter is currently the most used the Ayecka SR1. This type of receiver is definitely not the cheapest, but there are a number of advantages over USB plug-and-types. One of those advantages is that the recipient does not necessarily have to be in the vicinity of the receiver PC. And, if desired, can be received on multiple PCs, without anything having to be switched. As long as the PC, but network with the receiver.

In principle, the receiver can be coupled to the domestic mains. However, the amount of data received can increase significantly; 40 Mb / s or higher, at the 100Mb / s. So that is the boundary of a "normal" Ethernet connection. Now also on the same network other data is transferred (eg Internet download, or data from one unit offers sent to another PC) or the network may become overloaded, resulting in a slow internet connection, and even loss of data the receiver. The EUMETCast data is additionally sent to all PCs in the network.

With Gigabit Ethernet would not so easily have been a problem, I have not been here many experiences heard. Especially if the network is based on 100Mb / s

recommended for the EUMETCast service to create a separate network connection. If the receiving PC via the usual network should be able to then communicate that PC needs an extra Ethernet card.

With a 100Mb / s network there is a possibility to create a double-network without the drawing of an additional cable. Ethernet cables almost always contain four 'Twisted pairs', so 4x 2 wires that are twisted together. Of these, there are used for 10 / 100Mb / s, only two pairs, one for transmit, one for receive. The other two are used only for Gigabit Ethernet.

The unused wires can be used as an extra 100Mb / s connection, so there are two independent single cable 100Mb / s networks run. All that is needed are 6 ethernet plugs which two splitters are made. See the table below, this has to be 2x:

plug P1 (cable)	plug P2 (home network)	plug P3 (Eumetcastnetwork)
1	1	
2	2	
3	3	
6	6	
4		1
5		2
7		3
8		6

For a normal 10 / 100Mb / s connection, the wires used 1/2 and 3/6. Note: So NOT 3/4! The additional connections are 4/5 and 7/8.

Figure 1. Two 100Mb / s Ethernet work connected to one cable.

Figure 1 shows how things can be connected. Receiving PC has dual Ethernet connection here so that he can communicate with the normal network. Note: It may be tempting to insert a second ethernet card also use a switch to connect the two networks at the receiving PC. However, then the recipient of the EUMETCast data will through that switch yet also to all the other PCs are sent to another network, and now that we tried to prevent.

Note that the double cable used between the two splitters, no switch / hub should contain! The remaining connections are normal standard Ethernet connections so there may be placed switches to create branches to other PCs. Also in the "red" EUMETCast network, if multiple host PCs are needed. As long as the EUMETCast network but remains separated from the rest. Of course, this double-ethernet connection can also be used for other applications.

There are Ethernet splitters on the market that do the same. But they may not all fit. The text accompanying these products is quite confusing. Eg. at:
www.allekabels.nl

is called. network splitter for sale which must be appropriate according to the description, but then there is that you can not use both outputs simultaneously. So just be careful.

Again: The new METEOR satellite.

Summary.

This is a follow-up / correction of the description in the "Kunstmaan 3, 2014, about the HRPT data format of the N2 Meteor satellite.

In Kunstmaan no. 3, 2014, I have tried to explain the data format of the new Meteor satellite. On the site:

http://planet.iitp.ru/english/index_eng.htm

the sizes of various Russian satellites will be described. Such a description is pretty sparse, and can therefore be misinterpreted. With my first interpretation seemed like there was an error in the data sent, but that turns anyway (obviously) not to be so. So now follows a rectification.

This concerns, in particular, to the structure of the HRPT METEOR-N2 data. Each received frame contains 1024 bytes, as follows:

The four shown MSU blocks contain the pixels of the 6 channels. What now needs to be done is to merge these MSU blocks of consecutive received frames until a new byte stream. In the figure below, this is shown with two successive frames, but this is so "indefinitely" by.

For the determination of the start of a line is the position in the frame is no longer of interest; the MSU sync word (2 bytes) is to be now searched for in the lower data-stream. That sync word can therefore be anywhere, and not on two fixed points in the frame as I suggested in the previous article.

After finding the sync word MSU originated blocks of 11850 bytes:

The bottom stream contains between two MSU sync words, all the data for the selection of a line with six channels; 10-bit pixels and a horizontal resolution of 1572 that $10 \times 6 \times 1572 = 94320$ bits =

11790 bytes. Together MSU contains a so-frame $11790 + 50 + 10 = 11850$ bytes.

After finding of the MSU sync word, it is now a matter of counting down in order to pick up the 10-bit pixels from the data-stream. The encoding of 10-bits per pixel in bytes is identical to that of the Meteor-N1 satellite.

The table below shows how these pixels in bytes 51 ... 11 840 are incorporated:

byte No.	channel	bits
51	1	1 pixel bits 9-2
52	1	1 pixel bits 1-0; pixel 2 bits 9-4
53	1	pixel 2 bits 3-0; pixel 3 bits 9-6
54	1	pixel 3 bits 5-0; pixel 4 bits 9-8
55	1	pixel 4 bits 7-0
56	2	1 pixel bits 9-2
...
76	6	1 pixel bits 9-2
...
80	6	pixel 4 bits 7-0
81	1	pixel 5 bits 9-2
...
11840	6	1572 pixel bits 7-0

To summarize: To take a picture from the Meteor data stream, the following should be done:

- ☐ Find the 4-byte sync word in a frame. Now, the positions of the MSU-blocks are known.
- ☐ Stick all MSU blocks of all received frames together.
- ☐ Search this 8-byte MSU sync words.
- ☐ Now the positions of all the pixel bits are known and the image can be composed.

Hardware and software

Both GODIL decoder software (WSAT) are now eligible to receive and edit Meteor-N2 (HRPT). See my web site:

<http://www.alblas.demon.nl/wsathardware/hardware2.html#download>

http://www.alblas.demon.nl/wsatsoftware/soft_win.html#download

http://www.alblas.demon.nl/wsatsoftware/soft_linux.html#download

Diagram and PCB HRPT decoder

To have everything together are pictured again the diagram and PCB layout of the previously gepubliceerdeÂ HRPT decoder.

C4, C5, C6, C7 are not required is used as the TSR1-2450. The capacitors are required ie. Already present in this linked 5V stabilizer. If a 7805 is used then these capacitors be necessary. Ensure that adequate cooling! The current consumption is 300 mA.

The GODIL module contains two additional connectors on the ends.

On the connector at the bottom (see print) fits a OHO_DY1 display (possibly supplied with GODIL). This displays status information of the decoder. The (duo) LED 1/2 is not necessary.

The connector on the top (2x7 pins) is used to program the GODIL. Keep it free to install, so any easy update can be done.

137 MHz Preamplifier

Summary

This article describes an amplifier suitable for the 137 MHz band. With The New Meteor N 2 satellite this amplifier can be used in front of the RTL dongle. The amplifier has a bandpass filter to suppress unwanted outside-of-band signals.

Introduction

Last year the Russian Meteor N 2 launched. This satellite transmits next MHRPT in the 1700 MHz band LRPT signals in the 137 MHz band. About MHRPT is already written one and other. Bovendien is the decoder of Rob already suitable to decode these signals. If the receiver WRX-1700 can be used.

For the 137 MHz, the WRX-1700 is not suitable because there is no QPSK demodulator is present. Now there is in the form of cheap RTL-dongles a nice alternative available.

This RTL dongles are broadband and another insensitive. It is therefore to be done to clean up the signal.

Would you successfully Meteor N 2 in the 137 MHz band receive then you have a good antenna and a selective amplifier. Within our working group are the Helix Quidrifilaire antennes widespread. If the amplifier HA137 is useful.

The HA-137

This preamp is designed by Harrie van Deursen and published in the February 1994 Kunstmaan. Two versions were designed: With two inputs for a crossed Yagi or an amplifier with one input, the amplifier can also be powered via the antenna cable.

The far stronger is characterized by a high selectivity in a strengthening of around 13 dB, and a low noise figure. The band-pass filter consisting of three inductively coupled spool design provides for the high selectivity, this is necessary because the amount of station only increasing.

In the now twenty years old design N-FET BF981 is used only to obtain from old stocks and have been replaced by a SMD version. In addition, the used coils with core are difficult to obtain for the enthusiasts who want to build the old version still. Kent Electronics has the coils:

3 x Toko S18 orange 301SS / N-300

1 x Toko E526HNA-100073 (Poss. The 100 074)

The old scheme of the HA-137 can be found below.

Fig 1. the schematic of the original HA-137, together with the component layout

HA-137 with a new look

To limit the problems with getting components to a minimum in the new design basis of air hand-wound coils. From the GEO angle has also been interest in a good preamp for the 137 MHz, the reasons why we want to use only common components that are widely available.

Matching the circles to do with a trimmer. In addition, a new PCB design where the SMD version, the BF998 fit on one side serves as a ground plane.

The new design has a single antenna input because few will go with a kruisdipool to work. If you still want a kruisdipool work then you need to make an adjustment network with coaxial cable. Upon request, I information is available here.

The schema

In the diagram, the variable inductor is replaced by a variable capacitor. Now, the impedance matching with the input on the coil will have to be made. Ideally, the tap on the appropriate place on the coil are positioned for minimal noise. The position of the tap on the coil (L1 in the new schema, measured from GND) is inverted, the ratio of the value of the C 1 and C2 (In the old scheme). For coil windings $L1 = 5.5, 15 / (39 + 15) = 0,27 \times 5.5 = 1.5$ turns on this point Rob Hollander consulted that comes with contribution below.:

That was long ago, but I only have the Tech Note 1999-1 on nageslagen where in Annex I HA137 your state 'cut through'. The applied since 981 is not much different from the 991, which is more or less identical to the 998. I have to look for differences. Of the 981 is to be found, that the optimum Gs is ~ 0.6 -0.7, both at 100 and at 200 MHz. The optimal BS is at 200 MHz, two times greater than at 100 MHz, but that is because of the Cin, that determines the whole B. This capacitive Bs must be compensated by the inductance in parallel with the input.

As in TechNote state can compensate Bs get plugged by adjusting the input circuit at resonance with aerial and BF981 (but you usually do automatically). Instead of the antenna you can use a neat 50 Ohm termination, but remember that you also measures the noise of resistance, if you would like to determine the noise.

Suppose you want to stay with the 998 on the safe side and is targeting a Gs 0.7 (instead of the optimal 0.65 because the noise to 'low' values of Gs really increases, but 'too high' values increases less). This corresponds to a Rin of 1428 Ohms, and you have to pick up a resonant rise of the impedance by a factor of 28.56. That is $(L1 + L2) / L1 = 5.344$ (square root of the factor 28.56) (L1 and L2 is located under the top). $L1$ or $L2 = 4.344$.

I would have put the protection diodes at the input of the FET in parallel with the trimmer, because you love a pure circle about 1 resonance. The C's of the diodes at the input provide a separate circuit with L1 and there would ever be able to get experience. The C's of the protection diodes compensate you again with a smaller value of the trimmer. I would use fast low-capacity switching diodes.

If FET can be used both as the BF998 BF991. The BF998 has a higher gain than the BF991, as the difference in gain between the BF982 and BF981. That higher gain but gives more back operation to G1 and so likely to oscillate.

Figure 2. Diagram of the new HA-137. Only one BF998 is used. In the diagram, there are two on the board because two different footprints are included.

The PCB and schematic is shown in the open source drawing program Kicad. On request, to obtain the files with me.

Accessories

All the SMD-components are of the type 0805 and are well soldering with the hand.

For the trimmers are used Murata-trimmers that have a capacity of 4.2 to 20 pF. Matched stand the trimmers around 12 pF. Reichelt, etc. Dikes of copper-n them. SMD versions should also fit on the board. When purchasing the BF998 at the footprint, see further below.

Building

The PCB will have to etch, there are (still) no ready-made circuit boards available. The lower side is the ground plane. The four trimmers are mounted here. At the upper side are the rest of the SMD components and the air coils.

Note the fine print job that runs from the input circuit to the FET. For me there was a very thin hair sit in etching causing closure came to ground. The amplifier then does very little.

Building should be no problem. Install the first SMD components, the trimmers and finally the air coils.

Between the input circuit and the FET is a shot for the shield in order to prevent the preamplifier z ich start acting as an oscillator. This is also the reason that the input coil lie t and the rest is mounted standing.

Another point is the footprint of the FET used. It is unbelievable, but it is available in multiple footprints! In the print design can give you the 771-BF998WR115 (Mouser), this is SOT343R housing use. Also, the BF998 (RS 288-323) Infineon with using the SOT-143. The R version is a mirror footprint. You would FET upside mount and legs bend, but I have not tried. Spent so little time to find out whether you have a SOT-143, SOT-143R, or SOT343 SOT343R

Figure 3. Print Jobs around the FET. Only one is mounted.

The air-cored coil of the input circuit is lying mounted, the coils of the filter band alone. The branch to the input comes from the mass of windings on one side.

When mounting the coils, the top entry always on the side of the trimmer. GND is therefore under for connection on the tap as short possible to make.

Capacitor C2 (at the output) is mounted floating and is d e tap of the coil on three-quarters from the ground-side (this is underside of the coil).

Figure 5. The accumulated print

Air Coils

The four air coils are all identical. These can make the easiest through a 0.8 mm wire having to take a length of 25 cm, and in order to make a 6-mm drill bit 5.5 windings. Pull out the bobbin to a length of 7 mm.

The diodes on the side of the power supply are both mounted in the same direction. The diodes are crossed at the entrance.

Figure 6. Ironless

Adjusting

Adjusting the preamplifier with a suitable signal source to the 137 MHz. I myself am the happy owner of a spectrum analyzer, which is quite suitable for the setting. The preamplifier can you adjust a neat symmetrical curve.

The SA files created with the tracking generator to -20 dB and an attenuator at the input of 20 dB. So there is a signal of -40 dB in the amplifier.

Figure 7. Sweep 120-160MHz

Figure 8. Sweep 0-500MHz

Concluding remarks

I like to hear design improvements. The files for the schematic and PCB I would suggest your disposal. Have fun building.

Holder etching tank

Summary

This article Describes a holder, made from PVC tubing, for an etching tank.

Years ago I bought an etching tank of Velleman. This etching tank has a tube with a pump where air can be blown to the side to bubble the etchant. To the one or other reason, there are many particles in the etching are released which sit in the holes and they touch so clogged. To prosper etchings are those bubbles / oxygen needed.

Another problem were the two rickety feet where the etching tank at rest. By plastic fatigue was one foot already broken. The last thing you want is an etching tank from falling. The brown patches that iron tri-chloride causes go nowhere out! It was time to take the etching tank in progress.

At the household store, I bought a plastic box stock. If the etching tank to tip over or break (this is possible because the etching tank is composed of two parts which are glued to each other), then the etching liquid into the box. This is one less worry.

Figure 1.Etsbak In a box

The container fulfill the etching tank was resting a bit more work. The container I made of PVC pipe that I edited with a paint dryer.

I took two pieces of 30 cm and a saw and cut lengthwise. With the paint hair I made this soft so she clamps to the etching tank. At the bottom, I have two bent lips, so that they could be glued onto a base plate.

Figure 2. etching tank

The base plate is made of a lengthwise cut PVC pipe. Fully heat until it is soft and crush under a heavy weight and let cool.

The two uprights and the base I glued with PVC glue. Make sure you take PVC paste because the processed PVC is not perfectly flat. In normal PVC glue to share the bonding clamp can slide together. I then with the paint dryer connection of the stands and the whole heated at the eye vertically bent.

Fig 3. The foot

Finally I had to tackle the aeration. At the aquarium store I bought a plastic rod with tube. Holes in the drill rod and ready. With a piece of conduit can I ensure that the aeration tube is printed on the bottom. See also the pictures, it all speaks for itself.

Google Translate voor bedrijven:

LNA with the PGA103

Summary

This article Describes the first experiments with the PGA-103 from Mini-Circuits. This amplifier can be used to design a low-cost low noise amplifier for the 1.7 GHz band.

Noise Figure

For the reception of the 1.7 GHz band a pre-amplifier is required. Few will have a dish which is so large that a preamplifier is not needed. In addition to amplifying the signal is the most important property that a pre-amplifier has a noise figure as low as possible.

Why is this important? In order for a receiver to decode a signal the distance of the signal must to the noise floor of the receiving system are sufficiently large. Because the noise figure of the amplifier reduces this distance, you will have a noise figure as low as possible. Generate much gain is not a problem, a low noise figure though.

In the ongoing search for amplifiers, also called L (ow) N (oise) A (mplifiers) are called, have different models all looked at:

HEMT Noise Figure Designer Description

FHX35HP 0.45 dB Bertels Meier HEMT LNA. Widely used by members of the Working Group

MGF4919G 0.20 dB G4DDK VKNA2 / kit. HEMT on legs.

ZX60-242GLN + 0.85 dB Mini-Circuits Turnkey Module

PGA-103 0.8 dB Mini-Circuits Covers only HEMT

Now we must not overestimate the noise figure us. The first are designed mentioned LNA's E (arth) M (oon) E (arth) installations. Here you have to deal with extremely weak signals that come just above the noise. The satellite signals that we are to receive are relatively strong. With my dish of 120cm do I need an attenuator because otherwise I get overdriving the receiver! When the satellite just above the horizon, you need the additional reinforcement. Because the antenna is looking at the horizon will be this noise that radiates pick up the earth. This noise is much higher than the noise from the cold sky (as the satellite higher above the horizon). A low noise figure of the amplifier is not so important.

PGA-103

The PGA-103 comes in a SOT-89 housing and has the following characteristics: suitable for a wide frequency band from 50 MHz to 4.0 GHz. We can also use this for the 137 MHz! This in combination with a low noise figure. The HEMT requires a supply voltage of 3 to 5V, it is delivered through the exit.

The gain is 26 dB at 50 MHz down to 11 dB at 2 GHz. As a first stage in the amplifier chain, this is sufficient.

Building

Would you go with the PGA-103 to get started there are a number of options:

- Mini Kits in Australia [1] sells printed circuit boards, but also the required enclosures or a complete kit. There I bought a number of circuit boards and have thus built a LNA.
- LNA4All [2] is an amateur / supplier that supplies circuit boards and kits.
- Design your own print. Timo has his first experiments shown at the last meeting to design a matching network for the PGA-103. The datasheet [3] contains sufficient information to be able to work.

Fig 1. Accrued print and the bare PCB

Left

[1] Mini Kits

<http://www.minikits.com.au/PGA-103-Amplifier>

[2] LNA4ALL

<http://lna4all.blogspot.nl/>

[3] Datasheet PGA-103

<http://194.75.38.69/pdfs/PGA-103+.pdf>

2400 Hz tone detection and Goertzel algorithm

By Jan Mahieu, with an introduction by Ben Schellekens

Summary

This article Describes an Implementation of the Goertzel algorithm in the Arduino microcontroller for 2400 Hz tone detection. This can be used in the WRX-1700 receiver for detecting the presence of an APT-signal. The original design was scanning for the strongest signal. The Goertzel algorithm performs much better with Weaker signals.

Introduction

With the WRX-1700 can also receive the APT signal from the NOAA satellites. The APT is an amplitude modulated carrier signal of 2400 Hz FM modulated broadcast on 137 MHz. The bandwidth of the signal is around 34 kHz.

It is therefore important that the recipient also has the bandwidth to a wide bandwidth to receive additional noise, the bandwidth narrower than lose a portion of the information in the signal.

It is true that the recipient receiving frequency is not fixed: it's because temperature influences, the 64 kHz step size of the synthesizer and not least the Dopplereffect at the arrival of the satellite.

It is necessary to scan the receiver is received to the satellite and then to lock to the signal. In the WRX-1700 looks at the signal strength. Above the squelch level at the receiver lock on the FM demodulator.

In such a design means you have chance if the signal is strong enough to lock onto the wrong signal. Ideally, you want to lock if there is a 2400 Hz signal. In HRX137 Harrie van Deursen was done with an NE567 (a tone decoder IC) which is set at 2400 Hz.

The articles on the WRX-1700 I had previously indicated that it might be nice to do the recognition of the 2400 Hz tone through the microcontroller. Now, this worked! Jan Mahie you have taken care of scripts and tone detection built into the Arduino. Read below its description.

Frequency Domain

With an oscilloscope viewed we have a signal in the time domain. We can see the variation of the signal over a certain time period displayed. This can range from nanoseconds to seconds in many. It is also possible to display signals in the frequency domain. On the horizontal axis shows the frequencies, starting with zero Hz and ending at many GHz and. The vertical axis shows the signal strength. For example, with a Spectrum Analyzer, state by popular wish list!

In itself, it is useful if we have the receiver signal in the frequency domain because then we can see how strong the 2400 Hz component and thus know whether it is an APT signal.

With a Fourier transform, it is possible signals from the time domain to convert to the frequency domain. Go find your Internet Fouriertransformatie come quickly to pages for many of us incomprehensible mathematics.

Goertzel algorithm

Where Fouriertransformatie to the entire bandwidth of the signal looks Goertzel algorithm looks for one or more frequency components. The math behind the algorithm is then much easier. For example, you can do tone detection in a simple manner, e.g., at a pressure touch-tone phone (DTMF).

On the Internet, a readable article by Kevin Banks on the Goertzel algorithm found: The Goertzel algorithm. You can also find a C program to explain one or two things.

The implementation

The following parts of the mail correspondence with Jan Mahieu which one and describes another (also with a rectification of the scheme).

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First I want to mention a mistake in the diagram on page 114 of the KM from September 2012. The resistance between point 12 of switch S3 and mass must be removed and paragraph 12 of the switch must be grounded, otherwise the AD converter is never 0 volts inside and you get never see 134 MHz on the display. Also, you get a very fickle behavior when switching from 1698 to 1700 MHz.

I immersed myself in the Goertzel algorithm and an attempt to do lock the receiver on the carrier wave of 2400Hz. I have been long time sweet because that program is no picnic for me.

But I have finally succeeded even though my solution will probably be improved. Detecting the tone I performed in the program the Arduino (as a subroutine) and its implementation in the controller (16F684) on the receiver board.

I inserted my solution in both your programs and annexed + the library of the Goertzel algorithm.

I am now a week testing and lock works a lot better than the lock on signal strength. Not once was wrongly locked and keep the range is very stable until the satellite reaches the radio horizon. With the values of "N" and "TRESHOLD" you can what expirementeren because they have not proved overly critical.

I have the resistor R22 on the receiver board replaced by the value of 6K8 as originally shown in the diagram of the KM of December 2009 on pagina155. The incoming signal on pin 11 of K4, I connected TP1 of the display board. TP2 of the display board where the result comes from the detection on I put a link to the pin 13 connector K4 which connects to the pin 8 of the 16F684 where further processing occurs.

.....

My choice to use the Arduino to sample the signal is based on the fact that the satellite signal through R22 to the guided connector K4 is on pin 11 (pin 11 I have connected to the Arduino TP1). I thought this was meant to stop the programma in the Arduino. (Although it is to see if there is present is done in the tone of the 16F684 program). It would also be entirely in the 16F684 can be programmed?

Initially, I had made an attempt to program the algorithm in the 16F684, but I did not succeed. I like the program a lot easier with an Arduino.

In my attempts I made good use of a tone generator that I could tune in exactly 2400Hz. It allowed me to clearly perceive what was the influence of the parameters "N" and "TRESHOLD". That way I had to wait on a satellite pass.

The presence or non-presence of a carrier wave, respectively, gives a 1 or a 0 as a result of the Arduino TP2. (TP2, I connected to the 13 pin connector K4) These two states are thus offered to the 16F684 where we will use it in the program to see if there is or is not a tone present.

Actually, it was not necessary to use a subroutine in the Arduino because this subroutine, only one times addressed. I could also record in the Arduino program. I just found it a little clearer.

.....

#####

In the Arduino script subroutine tone decoder made which could be used regularly from the course:

```
void tone decoder ()
{
  goertzel.sample (tonedecoder_in); // Will take N samples

  float magnitude goertzel.detect = (); // Check for target_freq 2400 Hz

  if (magnitude> THRESHOLD) // if you're getting false hits or no hits adjust THRESHOLD.

  Digital write (tonedecoder_uit, HIGH); // If found,

  else
  Digital write (tonedecoder_uit, LOW); // If not found, or dissolves,
    delay (10);
}
```

In the beginning of the Arduino-sketch, the following is to be initialized:

```
#include <Goertzel.h>

#define tonedecoder_in A2
#define tonedecoder_uit A3

const float TARGET_FREQUENCY = 2400;
const int N = 200;
const float THRESHOLD = 2500;
```

```
const float SAMPLING_FREQUENCY = 8900;
```

```
Goertzel Goertzel = Goertzel (TARGET_FREQUENCY, N, SAMPLING_FREQUENCY);
```

Concluding remarks

The files are available for those who want to play around with it. Jan thanks for sorting out the many. It is very nice to see that this can be built into the Arduino!

We love hearing from adjustments to the WRX-1700. Maybe an automatic scanner over the channels of the NOAA18 and 19? Control of WRX1700 from the PC or FPGA? Enough opportunities.

Left

[1] Kevin Banks: The Goertzel Algorithm

<http://www.embedded.com/design/configurable-systems/4024443/The-Goertzel-Algorithm>

WEERSATELLIET IN DE RUIMTE GE-EXPLODEERD

Redactioneel

According to a report on SpaceNews.com on 3 February of this year, a twenty year old military weather satellite into cleans explodes due to a spontaneous temperature increase in the satellite.

As a result of this explosion are now there are 43 additional debris in orbit around the Earth. This satellite with number 13 of the "Defense Meteorological Satellite Program (DMSP), the oldest was in use, but not the first vessel exploded in the program.

The satellite with serial F-13 was launched in 1995 and until 2006 in active service. The loss does not affect the program because the satellite from that year was placed in a standby. The DMSP program are currently six satellites in orbit with launch of DMSP F19 in April 2014. The next launch, DMSP F20, is scheduled for November 2016.

The cause of the explosion is the Air Force sought in the power of the satellite. Shortly after the detection of a spontaneous temperature and attempts to

normalize the situation, was the 'Joint Space Operations Center' on the 'Vandenberg Air Force base a large number of debris observed on the spot where the satellite was at that moment.

Satellite DMSP F13, was in a 800-kilometer sun-synchronous polar orbit, popular with military weather and spy satellites.

On 25 February this year, noted T. S. Kelso, a well-known name within the community weather satellites, that 26 new debris in space, flying in an orbit similar to the list disappeared from the DMSP F13.

That this was not a unique event proves a similar accident with the DMSP F11 in April 2004. This satellite was launched in 1991 on the verge of 'disabled' are. This is a process where the batteries are discharged and all gases and fluids are vented from the satellite. During the event, there was only 6 kg of Hydrazine on board which is used to hold a satellite in position. This was possibly the cause of the explosion, the cause of the accident with the F13 is still being investigated.



Defense Meteorological Satellite System DMSP Satelliet, © U.S. Air Force

Report meeting January 10, 2015.**Opening by the Chairman.**

The President wishes everyone a good 2015.

The membership fluctuates at around 118 members. The membership fee remains the same. The Kunstmaan will now come in A4 format.

In the past year a number of our members remarked that came regularly to our meetings: Wim van Gaalen and Joseph Jongen.

Articles in Kunstmaan still come from a very limited number of members.

Last year there are given several lectures, including about Xtrack, GNU radio and reception of the X-band.

The WRX1700 sold are now 20 printing; of those present give it 7 that they have a working copy. Ben points out that mn APT will disappear, so some multivendor with the finish of the receiver.

Jan Mahieu has built itself a receiver and tone detection added to the PIC.

In the field of rotor control systems have been in recent years a variety of flavors come along: versions of controlled via DiSEqC to entirely self-built rotors of DC-motors.

EUMETCast was recently changed from system; Arne will tell you more about shortly.

Are further reports that there are plenty of activities to do by members such as measuring sessions, activities at Camras, etc.

Handbook for the story of the WRX1700 needs to be adjusted; thereafter the 3rd supplement can be printed.

Components for an appeal can be made to the common orders that are done regularly, especially at Reichelt and Mouser.

There are activities in the areas of SDR, complemented by a 137 MHz preamplifier.

On July 2 there will be a trip to Darmstadt; the program has yet to be compiled.

We plan to purchase a number of programmers for the GODIL that work via USB. From the hall, there are definitely two people who are interested. This will be noted in an extra newsletter so you can sign for a joint purchasing. The cost is 60 euros.

Report November 8, 2014.

This is in the December Kunstmaan. There are no comments.

Adoption agenda

No changes.

Administration

We are looking for a Webmaster.

Satellite Status

See elsewhere in this KM, as always cared by Arne.

Arne also reports that a new RTL dongle, which is more sensitive. Because the input sensitivity is still a weak point of these recipients may be advisable to add a conventional front-end, so the dongle can operate at a lower frequency. The new types of lower frequencies, so that this method is feasible.

Ben has experimented with a WRX1700 as front-end for the SDR dongle.

Any other business

Peter Smits has a question about Harry controlling DC motors with an Arduino. The Arduino has he suffered that pulses (the feedback) missed; if a 8052 is used in place of a Arduino, there are no problems. Possibly this is a hardware problem which has nothing to do with the microcontroller. A Schmitt trigger is used to "to polish" the pulses, but there is no filter in front of the Schmitt trigger. This means that narrow pulses simply pass through the schmitt-trigger and can not be filtered out.

Paul Baak: Has several things from the library displayed on the reading table, including the latest GEO, with interesting articles on to METEOR reception.

Henry Jalving: Has some equipment Geert van Engelen, who want to lose.

Elmar: Is working with SDR reveal the spectrum of the amateur band.

Timo: Has made a broadband amplifier with a PGA103. There is still a small network adjustment made. The amplifier runs until above 3 GHz.

Arne took power cords and network cables, for those interested.

Peter Kuipers has compiled a kit to make a dish can be made of 1.2 meters, especially designed for the 1.7 GHz band. Including parts bent. Fred goes verify the dish with this package hassle to build after.

Closure.

One does well to a comprehensive new year's reception, provided by our president. The following is a lecture by Ben:

Frequency Sweeper 1200 - 2200 MHz

In order to whistle by the frequency characteristic of an HF component an expensive factory unit can be used such as Rigol. A much cheaper method is to construct a sweeper with components include Minicircuits. Need a power meter, VCO, function generator and scope.

The VCO can be controlled via a PLL and ADF of Analog Devices. The latter can be configured programmatically, including the sweep range, and what is controlled type VCO (Minicircuits in our case).

The power supply must be well constructed; particularly when using a switched power supply, otherwise there is too much interference.
Arduino via the ADF can be easily set, and also the "sweep" can be controlled so (via SPI interface).

This design of a sweep generator costs about 200 euros (excl. Scope).

After the lecture chatting.

Rob Alblas
(Secretary AI)

Report meeting March 14, 2015.

Opening by the Chairman.

The President welcomes everyone. We go back to warmer weather, so time for outdoor activities (relating to antennas and rotors, that is).

On March 21, we are active again with a booth at the fair in Rosmalen. We are looking for stand personnel.

On July 2, at the request of GEO organized a tour at Eumetsat. The antenna farm in Usingen this year not visited because the uplink is now in Austria. There is possible on July 3, an excursion to ESOC, which, as I understand it, what will be more extensive than what we got in previous years.

For more information see:

<http://www.geo-web.org.uk/darmstadt-2015.php>

Adoption agenda

There are no changes.

Administration

We are looking for a webmaster. Robert Lang House wants some things do go see Rob.

Satellite Status

See elsewhere in this KM, as always cared by Arne.

Arne viewing or APT receiver front-end can be used for an SDR dongle for receiving Meteor LRPT. SDR dongles are quite insensitive and not selective; the HF-portion of an APT-receiver may improve this.

Any other business

Harrie v. Deursen trying to receive LRIT Meteosat, using the decoder of Rob.

The polarization is horizontal, but with an IUD (circular polarization) it works well. That goes even better, because a good "pot" for horizontal polarization is difficult to make optimal.

Peter Kuiper asks for the status of the driver onto the stepper motor. It runs with him yet not perfect. We discuss later, outside the meeting.

Peter Smits also has some small problems with tracking and various programs.

Elmar has again some things included in his "shop".

Herman Grotenhuis shows a sweeper seeing only 80 euros. The range is from 55 MHz to 4.4 GHz. There are types with a smaller range that are still cheaper. The use of this sweep generator is described in the next first-Funkamateer. This is a cheap alternative to filters etc. by measuring. The control is done with a program *NWT* (see <http://www.dl4jal.eu/>)

Peter Kuiper has a question about what to look for when buying a frequency counter. Ben: Please note that there is a prescaler in, and how many entries there are. At fairs you have to be careful what you buy; there may be missing parts.

Closure.

The first-next meeting is the AGM on, mind you, May 2nd.

After that Ben gives a lecture about receiving Meteor LRPT at 137 MHz. With a dongle only 10 euros and what free software is to receive it. Further, a APT antenna (eg. Quadrifilair) may be used. An RF preamplifier is also necessary to make it completely selective and more sensitive.

Rob Alblas
(Secretary AI)

From the library

GEO is pushing paper back: by 2015, the GEO 3 is times a year a pdf and then the fourth time a pdf + paper. I have my thoughts. For the display table it still must be printed. On screen reading of a magazine that is formatted for upright a4 (3 tall columns next to each other) is not easy either. But it saves a lot of weight.

Do you know that working as a librarian makes me physically very strong? Paper, a nice data carrier that has served us for centuries, has quite a weight and you notice that when you drag all those stacks. But by reading it I learn more and more. I share it with you.

Great events cast their shadows ahead. GEO 44 of autumn 2014 was full of articles about the Eutelsat conversion and also the coming of the Meteor 2. Also, an article about the reception of images from ISS. Naively I thought for a moment that we ourselves can retrieve those images with a dish, but that is nonsense, of course, with some thought, ISS flying low and comes overhead far too quickly. It is therefore intended that we use the supplied links. Mike Stevens tests two PCIe cards TBS for EUMETCast. My expectations were high, but more than that he and others in cooperation with the manufacturer removed a number of imperfections, I did not read. But if you think otherwise, let me know it.

GEO 45 then. John Barfoot explains how he has upgraded to receive Eutelsat 10a. New LNB, new software, new dish. Though successful, some issues remain. The software is fickle and the position of the dish must be precise. About performance by heavy rains there are concerns. Paul Geissmann has again suffered from the failure of receipt by heavy snowfall. You can expect that in Switzerland. The solution is to heat the dish ... A thick 100 watts and gone is your problem. Rob alblas explains the data structure of HRPT. A contribution to the international community that stands. Les Hamilton receives the Meteor 2 with LRPT at 137 MHz. Back to the cozy simple past? No, it was not easy! This was mainly due to increased pollution in the air at 137 MHz. And further into the GEO again the usual volcanoes, tornadoes and snow masses. Quite frankly, I think the reception technique is fascinating but cold pictures for me are all the same.

Our group purchased the 2015 ARRL handbook. Which is to expand the modern techniques even thinner, it's a big 5 pounder. Transmitters, receivers, power supplies, controllers, antennas and so I looked for dish antennas. Alas it's missing.... But it has a nice picture of releasing cubesats from ISS. The manual itself is a nice blend of theory and practice, and priced at 50 euro certainly not expensive.

Recent Electronics magazines have in the field of satellites unfortunately no topics. With of course the exception of our 100/1000 divider in the January Electron, and previously also our workgroup receiver.

In October, the ESTEC had an open day again. Fascinating but also very tiring. Next time I go again and I'll make a report. And if you yourself have the opportunity, seize the opportunity. ESTEC understands very well that they must win public support, they are working on it.

Financial e l annual statement 2014; Budget 2015

This is a list of income / expenses of the calendar year 2014. The actual revenue / expenditure can (partially) done in another year.

The balance sheet also includes hardware business, which can be sold. What is striking here is that there are two accounts of Nimeto expected.

The 2015 budget is also included here. The loss in 2014 is higher than last year, as was expected. Unfortunately, it is expected that this loss will increase in 2015. For now we can bear this loss, but over time will need to be looked at measures.

If there are any questions about this statement let me know oo v r the annual meeting (May 2015) so that I can explain that day eea.



Balance 2014



Book value hardware intended for sale; the end of 2014



Overview accounts end-year.



These are the amounts of the various accounts at the end of a calendar year.

Overview membership and revenue.



Membership.

The number of members continues to decline. 2015 8 members have canceled their membership, which we are now at 110 members. These must pay at the time of this writing 3 membership fee. (Yet to be recovered: 75 euros)

The following table shows the attrition seeing the past 6 years.



Rob Alblas

treasurer

Annual Report 2014

The Working Group

The number of members of our group at the end of 2014 with 118 members virtually the same as the year before. I must say that it has been supplemented in 2014 nine new members.

Meetings

As usual there were five meetings of the working group. On 1 January 1 was the first meeting with the traditional New Year Reception. It's nice that Fred and his visit to the Netherlands as planned he was again present at the first meeting of the year!

March 8 was the second meeting. After the General gave our editor a lecture on the design of an object in 3D and this then be printed by Shapeways.

During the annual meeting on May 10 word by the AGM to the Board the charge given to the policy of 201 and 3 to the financial statements the financial control committee granted its approval. The documents were scanned and advance to the members of the KCC (Rob Hollander and Timo Lampe) so that they could carry home the Checkwork.

After obtaining the annual meeting your president gave a lecture about GNU Radio with an RTL dongle These dongles for a few Euros and cover an area of 60 - 1700 MHz. The GNU Radio software is on a memory stick where Ubuntu / Linux is installed.

On the meeting of 1 September 3 Arne has given a lecture on the new method of transmission where new receivers are required.

On November 8 was the last meeting of 2014. Wim Bravenboer gave a presentation about the reception of satellites in the 8 GHz band.

Administration

In 2014 there were no changes in the composition of the Board. The vacancy for the position of secretary is still not completed and is perceived by our treasurer.

The work of the scholarship coordinator lie with the president. Joop Lankhaar has indicated to quit his job already as webmaster.

Exhibitions and Events

The Working Group on March 15 at the Flea Bossche (with reception of weather satellites) and on 1 November, on the Day of Radio Stood amateur.

We have more attention given to the establishment of the state. All items were descriptions and the material was more up to date. This could result because we've got a full-page examination in January of Electron.

The Kunstmaan

The Kunstmaan is released in 2014 four times in full color. In total, have been published 176 editorial pages, the same as in 2012. Our editor Harry Arends has been carefully compiled the artificial edition. The Satellite Status Arne was a regular feature. An integral part of the Kunstmaan is the report of the meetings recorded by our treasurer / secretary as Rob Alblas.

Fred van den Bosch placed in each Kunstmaan an article entitled "Weather satellites in Vietnam." Here he shares his experiences with the reception of weather satellites in Vietnam where he was coming against them himself in the exercise of the hobby.

In Kunstmaan of April was an important article on the Viterbi (de) coding. In almost all satellite links is Viterbi encoding used. This article looks at the "punctured" variant is used in weather satellites. In this Kunstmaan also the first article under the heading "First Image". In this section we want to show the first image and its story of a new receiving station. The WRX-1700 by Peter Cooper was discussed. Harry Arends wrote a nice story about the Arduino and analog switches. He wrote a story about an I2C keyboard and the Arduino programming environment. Antenna Rotators always a welcome topic. Fred describes the mechanical structure of DiSEqC installation. From the hand of the president a story about the USBee Logic Analyzer. This is an affordable 8-channel logic analyzer that can make up to 24 million samples per second.

The June Kunstmaan Rob describes the control of an X / Y with DiSEqC rotor from the FPGA. The idea is to control with a single USB cable to both the rotor to receive as the data. Our librarian Paul describes the magazines that have come in. The display board of the WRX-1700 has undergone a slight modification, Harry describes this and ordered to print a second series. With this new display board, the president made a frequency counter to the Arduino. It can count up to 7.9 MHz. Even his hand a sleigh Article about receiving GPS satellites through a module that you can obtain through eBay. The program GPS Sky you can determine the radio horizon. Also in this issue a travelogue from Rob about his trip, along with Elmar, to the GEO symposium. On May 3, we tried to get to the 25-meter dish of Camras MSG. This was unsuccessful, probably the head is unsuitable for the 1.7 GHz. Rob wrote a report about this.

On the front page of the October Kunstmaan flaunts a heavyweight rotor control, built by Peter Smits. Rob describes the data construction of the new METEOR satellite. The program is adapted to be able to receive this satellite. Your president has made a pulse counter with the Arduino. Display is used as an 8-digit display of eBay, the chip for controlling the MAX7219. Also of his hand a divider 1000 can be measured frequencies up to 6 GHz. In order to count high frequencies can be used a PLL-IC. Through a small program sets the PLL. The sketch of the display board of the WRX-1700 had not been published yet, so this omission similar but incorrect. And another "First Image", this time direct LRIT receiving the MSG satellite. A 160 cm dish Wim is used. The receiver is the RTL dongle with GNU Radio.

In the last Kunstmaan 2014 an article by Arne on the transition from EUMETCast DVB-S2 VCM. Unfortunately, his new receivers need! The minimum required diameter of the dish is also larger. Peter Cooper has been busy to make a new dish and wrote an article about adjusting the helical. Interesting for those who want to have bottom of the barrel. Your president has a Jupiter GPS module and managed to get a 10 MHz reference made with it. The PLL and amplifier to a design by Timo. The display is carried out with a Arduino. To finish the second part of "My HRPT Installation". It is now a well-functioning system. It turned out that the president suffered from GSM signals beaming and LNA oversteering.

Digital Kunstmaan

Six times, the Digital Kunstmaan released in 2014. Insofar as to verify the Digital Kunstmaan is well read. The open rate of around 70 percent is high. It should be noted that a great part of the transmitted digital newsletters possibly in the spam filters of the Internet service providers lingers.

Let anyone a novelty has for the digital Kunstmaan pass this to redactie@kunstmanen.net. We are the story of the association with the group.

Purchasing Action

There are several factions purchase at Mini Circuits and been with Mouser. A very small group of members making use of e here, is not built? Elmar organized various amplifier and a procurement action at Reichelt and Pollin.

Purchase Actions at RS could be interesting again because sometimes their prices are much lower than Mouser. At RS must have a Chamber of Commerce number and can not be ordered as an individual, our Working Group can be ordered from RS.

Handbook

The third part of the Handbook is waiting for merging the "My HRPT articles".

Library

Last year we had subscribed to the Electron (the Far on). Obviously we are working as a member of the GEO. We were members of the Dutch Society of Astronautics.

Loaning equipment to members of the working group is unfortunately rare. We have members of the miniVNA and Marconi signal generator available! The miniVNA lent several times.

Travelling

In 2014 ESTEC again held an open day. As mentioned Rob and Elmar went to the GEO Symposium. Rob, Harry and Ben have been at the Camras. The plan is designed to make a visit to EUMETSAT 2015 2015.

Website

We have a Facebook page, a Facebook group and a Twitter account. Activities to his are minimal. Twitter is especially attractive as an international platform. The website also deserves attention again, with the departure of the webmaster will not improve. Who will pick up the online presence of the Working Group ??

Satellites

End 4 201 were for APT NOAA 15, 18 and 19 available. HRPT was the NOAA15 (weak signal), 18 and 19. NOAA16 is no longer there.

New is the Russian Meteor N2 with HRPT and LRPT, the N1 has failed.

Chinese Fengyun satellites z assigns three signals. Decoding by us unfortunately not yet possible. The two Metop satellites, we can not decode yet.

Ben Schellekens, chairman

Satellite status

Since 23 September, there is unfortunately not heard from METEOR M N1.

Fengyun 3A, 3B and 3C transmit only AHRPT out, this is not to be received with a standard HRPT receiver and decoder. Unfortunately, this AHRPT not fully according to the standard so that even a Metop AHRPT receiver is not suitable for the FY-3 series!

Meteor M N2 LRPT is to receive 137 100 with an RTL dongle!

See <https://groups.yahoo.com/neo/groups/GEO-Subscribers/info>

MHRPT is in testing phase, this mode is not compatible with HRPT but can be decrypted with the new Rob Alblasconcert decoder!

NPP (NPOESS Preparatory Project) only sends the X-band with 15 Mbit / s. It recommends a tracking dish with a diameter of 2.4 meters!

EUMETCast since 31 Dec 2014 only receive DVB-S2 VCM on Eutelsat 10A 10 degrees east!

To further increase the amount of data sent over EUMETCast in the future to allow proceeded EUMETSAT in August 2014 DVB-S to DVB-S2 with VCM mode.

The new transponder is on Eutelsat 10A, 11263 MHz H and which is at 10 degrees East.

The broadcasting standard DVB-S2 8PSK 3/5 VCM (Basic Service) or 16APSK 2/3 (High Volume Service) with a symbol rate of 33 Msps.

Unfortunately, DVB-S and the most "DVB-S2 without VCM" recipients no longer usable.

With a special driver, some recent DVB-S2 receivers even for Basic Service Only. (Only the TBS 5980 and Skystar 2 eXpress HD, unfortunately this is not true for the SkyStar USB HD box)

The signal at 10 degrees east has a greater bandwidth and is therefore weaker than we were used to.

Recommended dish diameter is 80-90 cm for Basic Service and at least 120 cm for High Volume Service.

The reception of EUMETCast data is for amateurs free of annual fees, you must, however, register with EUMETSAT. Once you have software (60 Euros) and key purchase (40 euros).

In the EO Portal can log EUMETCast users and view their personal data and settings and adjust. Also registration as a new user and renewing the license is possible here. You can indicate on-line which products you want on your ECU. Existing EUMETCast users have received an email with an explanation and a login code and password.

To receive MetOp and / or Modis use a Ramdisk is needed, the following EPS data channels are recommended:

EPS 10 MetOp AVHRR

EPS 15 NOAA GAC

EPS EPS 18 News Service

Thanks to David Taylor and Douglas Deans for the info.