

X-mas Meeting: Fri 30th at the MCL Cafeteria in Kettering

Nov./Dec. 2011

ANOMALOUS PROPAGATION

Newsletter: *The Midwest VHF/UHF Society*

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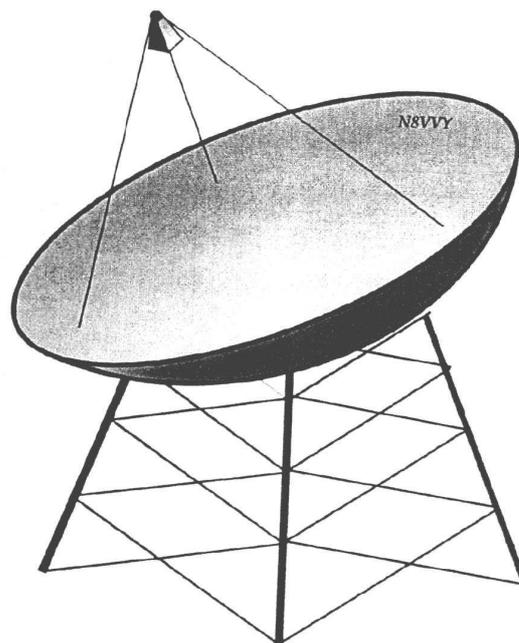
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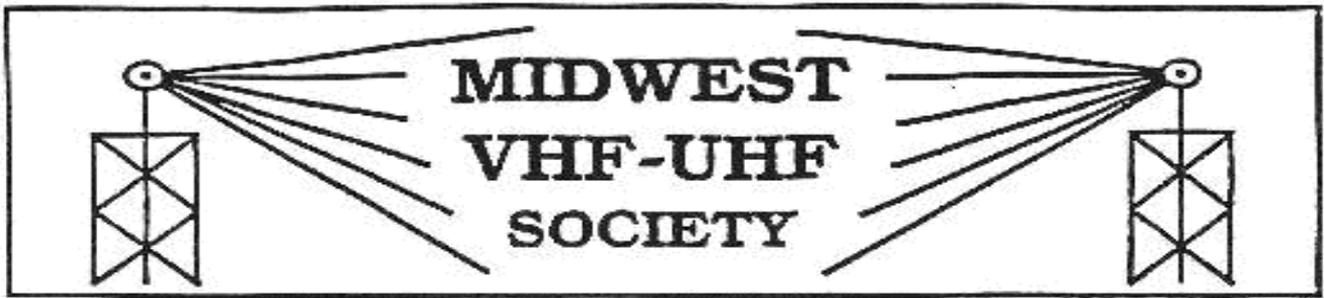
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Mtg Fri 30th of Dec. (6:30PM) MCL Cafeteria on 4485 Far Hills Av (Rt. 48) in Kettering. Going South from Dayton drive past the Town and Country Shopping Center on your left. At the next light turn right, then left into a small shopping center. MCL is at the end on the right

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Upcoming Events

A Merry X-mas (We Assume you were good throughout the Year)
And the gadgets you always wanted for Christmas
AND: A Happy New Year 2012

The Editors, Steve, K8UD & Gerd, WB8IFM

Resolution suggested:

"I promise to share some of my thoughts on Ham Radio and the higher frequencies And some of my (otherwise secret) knowledge about how to succeed in working far away stations (called DX) and mail them (e-mail OK!) to the editors of this newsletter"

Don't forget the January VHF contest!

DE N8ZM

As the end of 2011 fast approaches, and the holidays with it, it always seems like the time available to get things done shrinks dramatically. Or maybe I am just traveling too much.

Our Holiday Party will be December 28th and we have the MCL scheduled. The turkey overdose from Thanksgiving should have worn off by then. 6:30 PM as has become the custom, and bring the better half along. It seems like they have been more in attendance lately, which is terrific, although it has forced me to clean up my jokes a little. I would hope to avoid having a formal meeting, but maybe we can take a little time to discuss what we want to see MVUS accomplish in 2012.

W8PLZ seems to be serious about staying in the Denver area, and tells me he has already made contact with two very large clubs there. He says both are active in VHF contests, and that is all he needs to know about them. It will be strange to work him on the other end of a contest QSO!

Many thanks to Bruce Raymond (AD8I), Tom Stauffer (W9NBS), Joe Muchnij (N8QOD), and John Human (N8VZW) who stopped by on the Monday before Thanksgiving, and Mike, W8RKO, who came up to the house the following Wednesday for their help with testing, assembly, and calibration of noise sources. Bruce, Tom, and John accomplished a lot of assembly work, while Mike helped me work on some performance issues. I had hoped we would have a solution but have discovered that we might need to revise the PC Board layout and change some component values. Dang! I really expected this to be a bit simpler than it has turned out, but that's the way it is in R&D.

Have a Happy and Joyous Holiday, and a Prosperous 2012!

Tom

This a That 11/12 -2011

Failures. "Many of life's failures are people who did not realize how close they were to success when they gave up." - [Thomas Edison]

Horse Power. ...Knowing that the car had only a 1.5-Liter engine and only 100HP, I was prepared to just tootle along for the week.... [Jimmy Dinsmore] Maybe he has forgotten what just one horse can do! Ed.

Quality in a Truck. "No computers, a purely mechanical device suits me just fine. I know too much about computers to think that a vehicle becomes more reliable when you add electronics. It doesn't. It becomes a rolling, dirt-ingesting, overheating pile of silicon and programming that subjects your driving experience to the mercy of wires; more wires; software geeks; and, worst of all, wire connectors."
[Howard Johnson, EDN, Nov 2011]

Eye Catching. Ad in Ft Wayne (Indiana) paper: Picture of a moose with a smiley face, holding a mug of beer. And the inscription: The Lucky Moose...Come In. Eat. Spend money.

Packaging. "The packaging for a microwavable 'microwave' dinner is programmed for a shelf life of maybe six months, a cooking time of two minutes and a landfill dead time of centuries."
[David Wann, Buzz worm, Nov. 1990]

Bugs Bunny. When this cartoon icon first appeared in 1935, he was called "Happy Rabbit".

Reset Button. Each radio needs a big red button that is labeled "Restore Factory Settings" or "Preferred Settings". That would eliminate moanings like: Oh. I am receiving the wrong sideband! Or: Darn, forgot to crank up the "mike gain." Or I am sending with the wrong VFO.

Mike, K9MW (ex "Drake man")

Artificial Leaf. This Leaf- a thin silicon solar cell with cheap catalytic materials bonded on both sides - can split water into hydrogen and oxygen when exposed to sunlight, with the gases useable later to power a fuel cell.
[Time, one of 50 best inventions of the year]

Pot Holes. After a Cincinnati woman driving her choking 8-year-old daughter to the hospital hit a deep rut, dislodging the locket stuck in the girl's throat and saving her life. "Oh, Mom, I feel better. I don't feel it anymore." Said Lucy Davis, after the locket dropped down to her stomach. [Newspaper Story]

Evil People. The world **is** a dangerous place. Not because of the people who are evil, but because of the people who don't do anything about it. [Albert Einstein]

Atmosphere of Mars. Carbon dioxide 95%, Nitrogen 2.7%, Argon 1.6%, Oxygen, Carbon Oxide, Water Vapor and other .7%. [Eyewitness Book on Mars]

Tall Tower and Red Lights. KTKA-TV in Kansas transmits from a 1440' tall tower supported by 27 guy wires. Towers such as this take a toll on migrating birds. Millions are killed each year. The warning lights, especially the red ones, seem to confuse the birds. They often cycle the tower and end up hitting the guy wires. Scientists studied this tower and found about 1000 birds representing 58 species were killed here between 1998 and 2000. [Ted T Cable & Wayne A. Maley / Driving across Kansas]

Know the Difference? Me, I don't know an Apple Jack from a woodchuck. I don't know a heron from an egret, a hard drive from a soft drive, barley from a hop. But I know a good Thanksgiving turkey when I see one. [Chris Erskin, L.A. Times]

Quality. "Quality is not the result of comprehensive computer simulations. Quality is the result of knowing and anticipating, through experience, how an end user will actually use a product."
[From EDN Mag. reported by Joe, N8QED]

Up and Running 1296 MVUS Beacon

Beacon frequency: 1296.080 MHz +/- 1kHz
Power: ~2-watts at the antenna
Antenna: 800-foot AGL, single halo
PBS Ch16 Twr, Guthrie Road, W. of Dayton
39-43-16
84-15-00
Mode: CW- Beacon call: W8KSE/B

The beacon is now operational using a temporary configuration. The frequency is **1296.080 MHz plus or minus a KHz** or so. The beacon is running under the call **W8KSE**. We have 900 feet of 7/8" hardline going to **the antenna at the 800-foot level on the tower.**

Line loss is very high at this frequency so only 1/20 of the power is actually getting to the antenna. Input power is around 20-watts which gives us only **a watt or two at the antenna**. The antenna is **a single halo**. The antenna package was built by Mike, KA8ABR.

The beacon sends the following message: W8KSE/B EM79UR 2 WATTS 800 AGL <key down for twenty seconds> message repeats

When the beacon first went on the air K8TQK was able to hear it 69 miles away running S5 to S7. A few days later we had some propagation enhancement that provided the best signal report so far. The beacon was copied **205 miles** away in Sterling Heights, Michigan. That same night Bob, K8TQK, had the beacon around 20 over S9. That is very good considering the low power at the antenna.

The temporary beacon configuration is an FT-817 driving a Down East Microwave 1296 transverter. The keyer is a PIC processor programmed for the CW message. A permanent package is being designed.

In Centerville I am listening to the beacon on an R7000 receiver connected to a Discone antenna fed with 9913 coax. Not a very good arrangement at 1296 but I can hear the beacon with no signal reading on the S-meter.

I want to thank Bob, K8TQK, for putting the word out on the beacon and collecting signal reports.

Mike, W8RKO.

Other reports from last night:

K8JA Sterling Heights, MI (205 miles), S-5

N8DJB Pemberville, OH (125 miles), S-5

I need to work on the beacon keyer. When the 64 repeater is up RF gets into the keyer and it stops sending. The beacon is mounted inside of the 64 repeater cabinet just above the power amp. So if you hear the CW messed up that is why. The keyer is just built on perf-board so no immunity to RF. This is a temporary beacon until the final package can be built.

And another report:

I copied the beacon last night as well.

S5-6 in EN91bf Brunswick, OH (164 mi) around 03:40 UTC

73...de Gerry, K8GDT

70 cm to 13 cm Transponder in Ft Wayne

By Steve, K8UD and Gerd, WB8IFM

As every year, just the weekend before Thanksgiving, Steve, K8UD and I make a trip (~120 miles) to the Ft Wayne, Indiana ham fest. The way we look at it: after the Hamvention in May this ham fest comes just midway before next year's Hamvention and it is a good opportunity to look around meet friends and find out what's new in the world of ham radio and do a little bit (or more) of shopping.

We leave Friday night for the 2½-hour drive and stay two days till Sunday afternoon. We are ready early Saturday to arrive before opening and set up booths for AMSAT and Consolidated Electronics (Steve's outfit) side by side.

As an attraction and for a try-out this time we lugged along our transponder (input 70cm output 23 cm). We had taken it down from the roof to install a new local oscillator and after some initial checkout were ready to put it back in service. So it was an easy decision to take it along to Ft Wayne. We had rigged two HTs one for the input (uplink) on 435 MHz and one for the output: IF of 147MHz from a 2.4 GHz Drake Converter (modified). At the transponder we monitored the output of the 30 w PA with a 5mA meter. Full power was approx 4 mA. As antennas for the transponder we had a multi element commercial Yagi for 2.4 GHz pointing straight up and for 70cm we were using a homebrew ground plane with 4 radiators vertical polarized. The "ground station" used a rubber ducky for transmit and a quarter wave length (6.5cm) of wire stuck into the center of the N-connector of the converter.

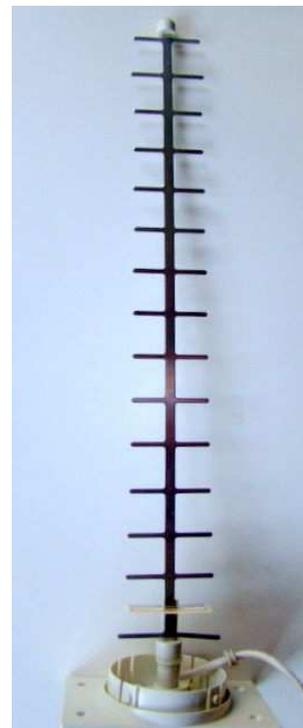
The transponder, mounted on a large aluminum board was placed on one end of the table and the two HTs a few feet to the side. Keying the transponder (in the lowest power setting) brought the output meter to full scale. And walking to the other side of the exhibition hall (est. 200') still kept the output at full scale. We got good results as well inform the presentation room, however, we received a terrible crackling noise from some source in that room. You could hear the voice but it was very annoying.

Many stopped to look; we gave a brief description what we were showing including a brief demo. We noticed that a few other relatively weak signals were also received by the transponder they were there just brief periods of time. Would have been nice to have a (calibrated) panoramic display to tell the input frequency for some clue. A 2m-signal vy close by to the input gave a small indication on the output meter. Changing the polarization reduced the output considerably for both the 70cm desired input and the 2m forced input.

I took a bunch of pictures but by transferring them to the Pc and in the renaming process they disappeared and all efforts to find them so far were unsuccessful! So I took some new pictures shown below with explanations.



Transponder, left the 30W 13cm PA, right, power supply, above output meter and 23cm preamp and filter, left center, transponder core 70cm and 23cm converters to 13 cm, above that, new local oscillator /2838MHz



13 cm Long Yagi



70 cm Groundplane Antenna

Repeaters and Transponders

By Gerd, WB8IFM

A few words about repeaters and transponders. The differences are important and striking, particularly in respect to ham radio and the often emphasized importance of emergency service.

Let's start with repeaters. When they were new they caught on like wild fire among hams. They were filling a need for easy local communication. From the beginning they were associated with hand held and mobile "radios". Just in time when WW2 surplus of military equipment dried up, police and firemen equipment was replaced with something newer and became available as surplus to the hams.

My first 2m FM handy talky was a Heathkit and I have had numerous commercial sets since. A telephone keypad was an early addition; it made signaling with tones possible and, of course, connection to the telephone network. Who could imagine that one day, mom, pop and ALL the kids would have a cell phone. And now this "device" can do so many "not telephone" things, I think few people can name them all. And all this is **wireless!** Compared to this, what we hams do with our repeaters could be considered medieval. As an example, there were great hopes when packet was introduced to provide a quick and efficient way to send messages (somewhat like texting or twitter) to friends all over the world. Efforts were made to connect repeaters to form something of a worldwide network. However, my trials indicated that my messages were hung up in some mailboxes for days before being passed on.

Here now how repeaters work: their mode is strictly FM. They are one channel devices: receiving your signal on one frequency, demodulating it and modulating their own transmitter on a frequency a fixed amount, like 600kHz on 2 m, either higher or lower on **the same band**. Operation is **half duplex** like a normal QSO where you transmit, your partner receives, then he transmits and you receive. Repeater antennas are usually at high locations, some on towers several hundred feet tall. They easily cover a large area, like a city, its suburbs and the surrounding countryside. BTW there is no need to run high power at the repeater, 10 W is usually plenty enough as only one signal is generated, so the power is not shared. A repeater running 50 or 100 W is truly overkill (and counter to an FCC Rule for using only adequate power necessary for a connection.)

A Transponder is similar in a way that it "repeats" your signal as well, but you pick the modulation, bandwidth etc.

Reception is also at a fixed frequency offset but on another band. The reason for this is that a transponder is mainly used on satellites and there space and weight being at a premium, large filters (cavities) have no room and in any case transmitting and receiving with closely spaced equipment and antennas on a close-by frequency is very difficult! So even commercial transponders therefore use separate bands. Now the fact that the transponder is linear also allows multiple signals to be added on the same frequency without causing distortion. That means you can have a three-way or even 4-way QSO. In any case you listen at the time you talk for full duplex as with the telephone.

Did you know, that during the Katrina Emergency the main contribution of the hams was, that they knew how to operate "half duplex" or just plain "simplex". That difference will become apparent if you give a layman an HT, explain how to push the button etc and see him try to communicate! It won't work! Saying "over" is about the only thing they master quickly, I think mainly because they hear that on TV or in Movies. With a satellite and a transponder the only thing bothersome is the delay, which makes even Ham operators sometimes talk funny!

The signal you receive on the downlink, as the transmission of the transponder is called, is also proportional to your input: a weak signal will be weak! So it pays to use some power on the uplink as well. Too much power, however, is frowned on as every user shares with everybody else and a strong signal gobbles up most of the available power. Also FM is generally not used as it runs constantly at the top power of the TX. Ingenious methods have been developed to attenuate "above average" signals.

We already mentioned that the transponder uses "bands"; so you can have a wideband signal or many narrow band signals or any combination thereof. Typically AMSAT transponders offered 150 kHz BW which accommodates easily 50 SSB stations. Our "earthbound" transponder has much larger bandwidths thus is an ideal platform for experimenting with advanced wideband signals.

If for a repeater a tall tower is the usual goal, for a transponder a satellite with vastly more ground coverage is the goal. Ideally you might want a geostationary satellite and, of course, most commercial Satellites are of that kind. They hover over the Earth at the equator at 22,000 miles and follow in synchronism, so you can "bolt" the antenna, once it is aimed correctly and forget it! We hams used to be lucky to hitch a few rides with big rockets that delivered our satellite to what is known as a **geostationary transfer** orbit. From there, the

satellite has to continue on its own meaning there has to be an onboard rocket to propel it into the desired final orbit which usually requires two or three extra burns. AMSAT built a number of these satellites and was lucky to get rides for transfer orbits on the early experimental rockets. Those were the days when quite a few rockets didn't make it until a way was devised to hold the rocket on the ground until sufficient thrust was built up to get going vertically. Now rockets are started at count - 3, that gives the engines time to build thrust by the time the count is 0. That's when they are let go and the climb starts.

The orbit achieved by AMSAT was a semi-geostationary orbit, meaning it is not a circle but an ellipse with apogee at roughly 22,000 miles. At perigee the satellite is close to earth much like the low orbit satellites we have presently to contend with. Once I observed one of these satellites at perigee and was amazed at the signal strength. Of course this only lasts for a few minutes. This orbit, also called a Molnya Orbit is used by Russian TV satellites as it provides better coverage of the northern hemisphere. The US is close enough to the equator so geostationary sats are ok. Four of these type satellites built by AMSAT were launched with various degrees of success. The first one got lost shortly after launch. The second one, Oscar 10, was ok and the third, Oscar 13, was quite successful. The big one, Oscar 40 took a long time to take shape got into the transfer orbit but its life was cut short by a mishap during subsequent firings of the onboard rocket motor to improve the orbit.

Today AMSAT-DL has a new Satellite, P3E, patterned after O-10 and O-13 ready to go, but a few Million Dollars are needed for the launch.

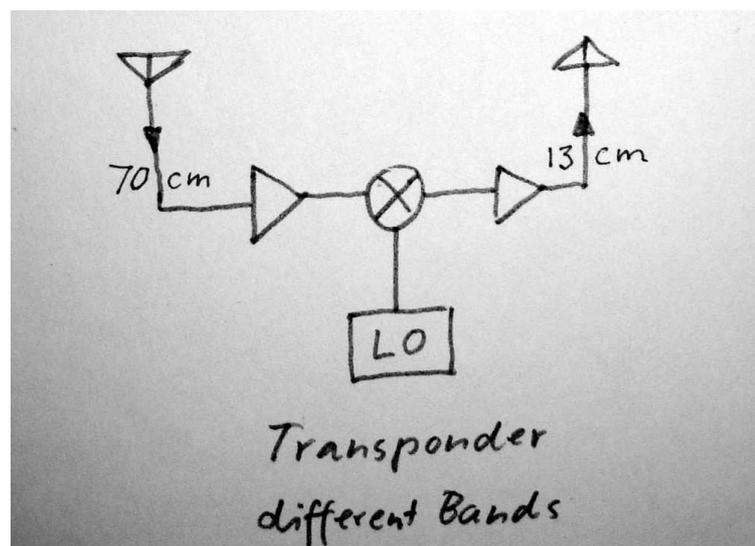
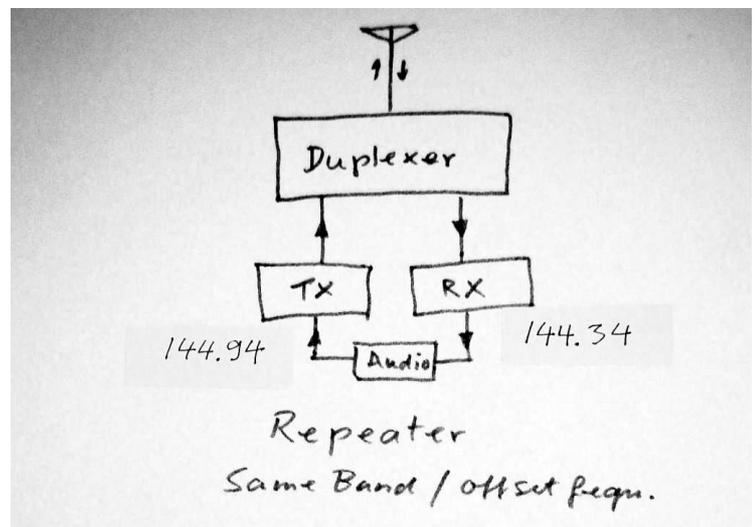
This Molnya orbit provides 8-hour coverage per day and migrates around the globe so different parts of the earth get illuminated every day. The southern hemisphere is at a disadvantage but still gets some coverage.

I got interested in O-10 in the 1980s. Here we had a satellite that with its transponders could replace the ionosphere/short waves combination for worldwide communication and could do it with 100% predictability. No more dependence on "conditions".

Well now we are in "standby" mode and I think this is a perfect time to use a few transponders to acquaint the general ham population with the operation, techniques and advantages in the use of a transponder. We will operate our transponder on earth*. This limits the coverage but it removes

bandwidth and power restrictions as it is connected to the power mains and not powered by solar and batteries. There are no extreme cosmic rays to protect the electronics but there is the danger of lightning damage. To eliminate overload by local FM signals polarization is horizontal which works quite nicely. But, of course, we will see how things pan out. Nothing beats an actual live trial.

- Some say the unit should be called Translator because it is on the ground.



SatPC32 Version 12.8b Available

AMSAT News Service Bulletin 296.07
 From AMSAT HQ SILVER SPRING, MD. October 23, 2011

SatPC32 version 12.8b is available for download at
<http://www.dk1tb.de/downloadeng.htm>

The main SatPC32 program window now displays more information such as the date of the Keplerian elements file in use.

Before upgrading your SatPC32 installation, be sure to use the new program (in the ZIP file) to backup your user configuration. The upgrade erases all previous user configurations, but the new program will restore your configurations after upgrading.

The download is a demo version that requires users to enter their lat/lon each time the program is started. To make the program fully functional, enter your existing registration code or purchase a registration code from the AMSAT web site:
<http://www.amsat-na.com/store/category.php?c=Software>

DK1TB, the author of SatPC32 has donated the software to AMSAT. All sales of SatPC32 are used to support AMSAT.

Here are the changes described in the What's New file:

1. SatPC32, SatPC32ISS, Wisat32 and SuM now support rotor control of the M2 RC-2800 rotor system.
2. The CAT control functions of SatPC32, SatPC32ISS and Wisat32

have been expanded. The programs now provide CAT control of the new Icom transceiver IC-9100.

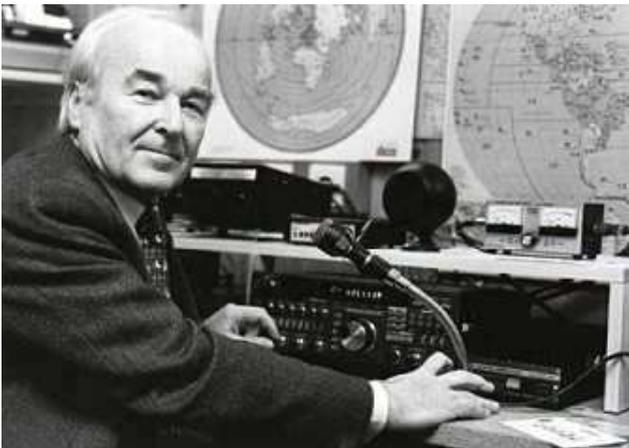
3. The main windows of SatPC32 and SatPC32ISS have been slightly changed to make them clearer. With window size W3 the world map can be stretched (only SatPC32).

4. The accuracy of the rotor positions can now be adjusted for the particular rotor controller. SatPC32 therefore can output the rotor positions with 0, 1 or 2 decimals. Corrections of the antenna positions can automatically be saved. In previous versions that had to be done manually.

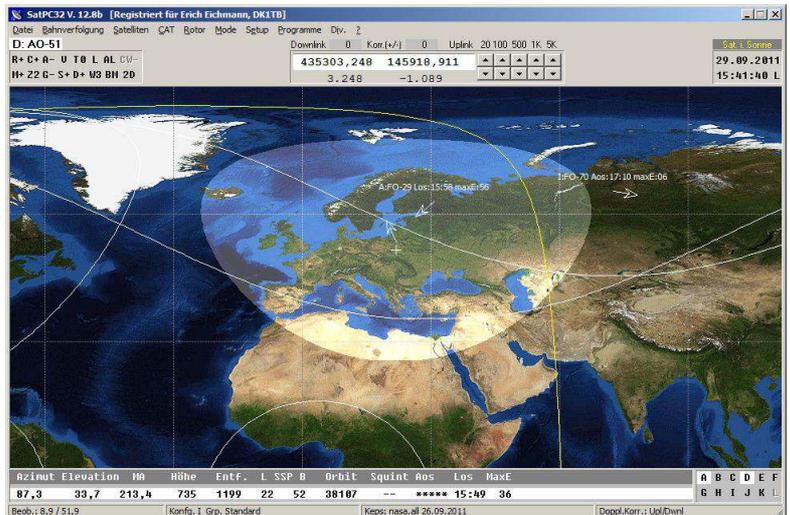
5. The tool 'DataBackup' has been added. The tool allows users to save the SatPC32 program data via mouse click and to restore them if necessary. After the program has been configured for the user's equipment the settings should be saved with 'DataBackup'. If problems occur later, the program can easily restore the working configuration.

6. The rotor interfaces IF-100, FODTrack, RifPC and KCT require the kernel driver IOPort.SYS to be installed. Since it is a 32-bit driver it will not work on 64-bit Windows systems. On such systems the driver can cause error messages. To prevent such messages the driver can now optionally be deactivated.

7. SuM now outputs a DDE string with azimuth and elevation, that can be evaluated by client programs. Some demo files show how to program and configure the client.



Erich, DK1TB, at his Station



Showing Coverage of the AO-51 Satellite on the Sat-PC Program

Screen Shot from The Commodore-64 Program



1985

A veteran of computer run satellite programs, Erich's first one was for the Commodore 64 back in 1985. That was simple enough, but would still do a good job today, that I could get in there and make little changes, just by looking at the program lines. On the left you see a screenshot of this program that Erich also used on his QSL-card!

His Station Today (out of this World!!! As per Webpage)

- Icom 910H - Kenwood TS-2000 - Yaesu FT-847
- Maspro Kreuzyagis f. 2m und 70cm
- Kenpro KR 5600B
- Pent. IV, 3 GHz - TNC 3S
- IF-100, WinRotor, ARS, WOLMD Mini, Labjack U12/U3
- Eigenbau-CAT-Interfaces
- Software: Wisp32, SatPC32, Wisat32, DDESat32

Inflatable Antenna Support.

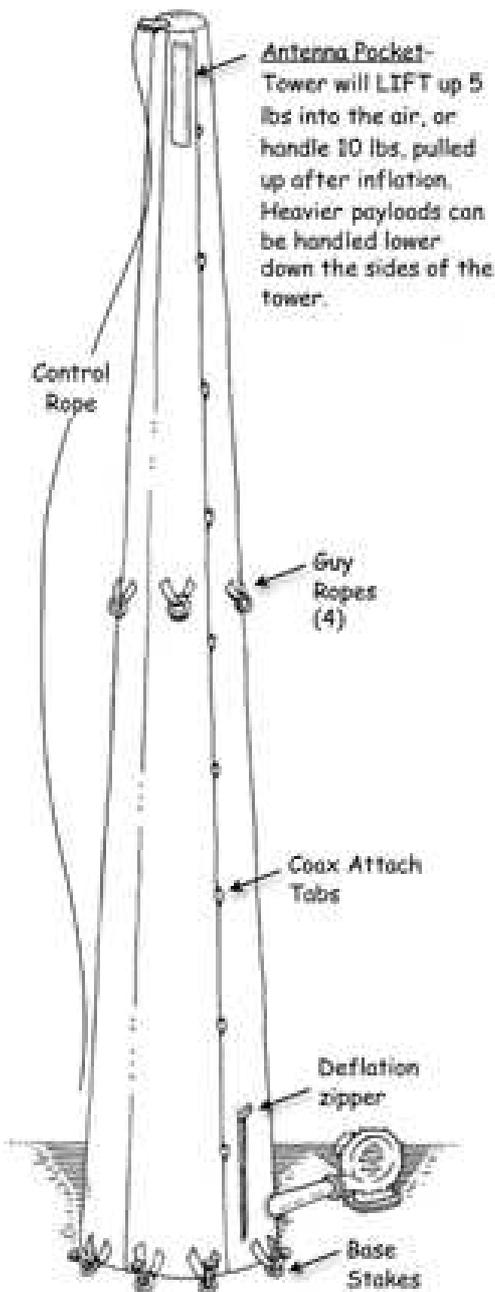
A Big Attraction at the Ft Wayne Hamfest (19/20 November) was an inflatable tower.

It so happened our Booths were just diagonally across from each other. So we could not avoid looking at it. They were showing two towers one smaller and one bigger. The spec sheet for the bigger tower is on the left. This is the one they recommend for Ham use and at 33 feet it can be quite useable for emergency operations.

They were blowing this thing up, and then using the control rope pulling it down again. Impressive and fast. I took at least 20 pictures of this* and more from the hamfest, but for an unknown reason I lost all in the process of transferring them to the computer.

Of course, we have been using guyed masts or towers for years on Field Day to support small antennas. Still this "blimp like" tower would be an asset, aside from the antenna support act as a Beacon, a visual sign of an important activity. [WB8IFM]

*There is a U-tube clip:
 "33 ft Inflatable HAM Antenna Tower"
 Company name: **LTA-Projects**
 Special Hamfest price ~\$900



Specifications

Height	33 ft (10m)
Base Diam.	59 in (1.5m)
Weight	52 lbs (20kg)
Shipping Wt.	57 lbs (22.7 kg)
Cloth	10 oz vinyl-ctd, 1000D Polyester
Blower	115V AC, 5.5 Amp

Instructions

1. Unpack tower system
2. Nylon tie Co-ax in place
3. Antenna in Pocket
4. Drive in base stakes
5. Hook up blower
6. Plug in to 115 V Power
7. Hold top near base
8. Hold top down using control rope
9. Ease your antenna up slowly as pressure builds

About Anderson Power Connectors

This is for those that use the Anderson Power Pole DC connectors. I have always used the separate red and black shells that connect together with the option of using a roll pin to keep them attached. PowerPole now has an option where you can get the red and black permanently bonded together in one unit. I don't know how long they have offered this option as it has been awhile since I have ordered the connectors. Worth checking out if you always connect the two shells together.

Mike, W8RKO