

October 2004

ANOMALOUS PROPAGATION

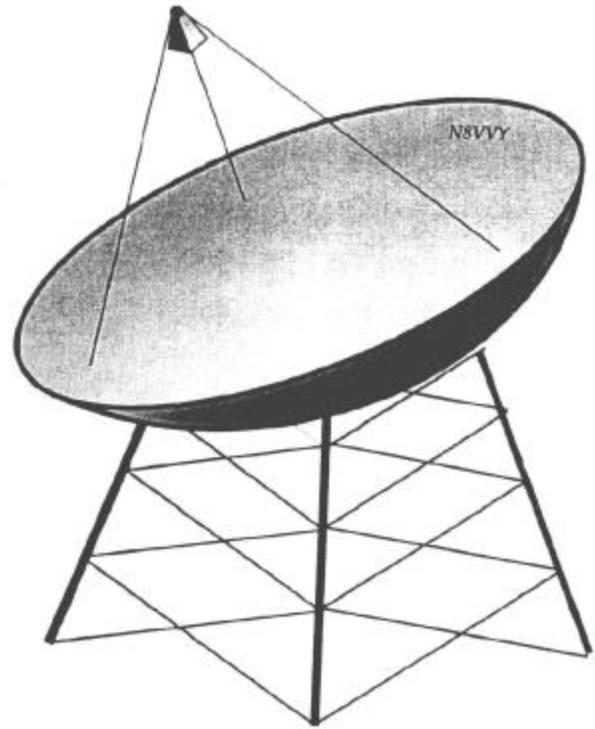
Newsletter: **The Midwest VHF / UHF Society**

Editors:

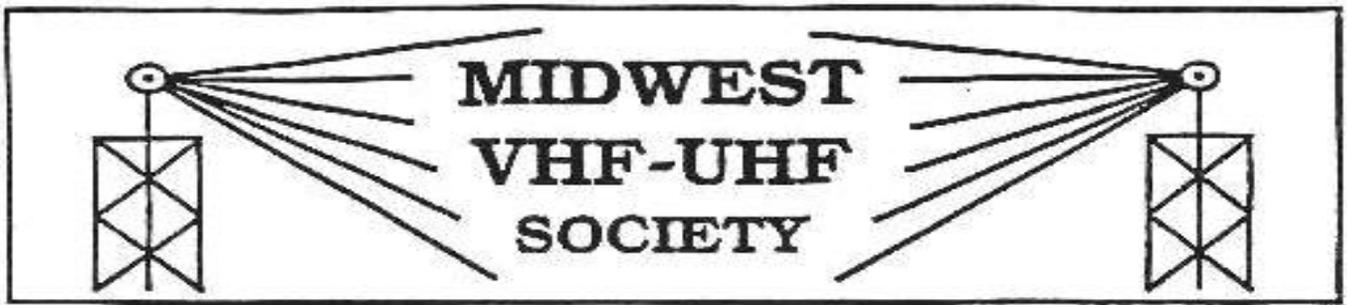
Gerd Schrick, WB8IFM
4741 Harlou Drive
Dayton, OH 454 32
(937) 253-3993
WB8IFM@AMSAT.ORG

Steve Coy, K8UD
3350 Maplewood Dr.
Beavercreek, OH 45434
(937) 426-6085
K8UD@ARRL.NET

Material from this publication may be copied
with due credit to the source



Annual Society membership is \$ 10.00. Please
make checks payable to Gerd Schrick



Vol. 18 No. 8

www.mvus.org

October 2004

Club Memorial Call W8KSE

10 GHZ Beacon: 10368.750 KA8EDE EM89ap Xenia, OH, 50 mW, 16 slot wave guide at 89feet

Meeting at the oldE country Buffet !

Our **October Meeting** is on **Fri. the 22nd** at 7:30 PM
at the Old Country Buffet near SR 725 and Yankee Rd. in Centerville
Discussion: Microwave Update 2006 and new and old club projects

Contents

De N8ZM.....	3
This and That.....	4
The Second Weekend.....	5
New 47 GHz Record.....	5
Hamarama and Radioactive Summer.....	6
Chemistry 101.....	7
New Logarithmic Detector IC.....	8
The Devil is in the Details (Transponder News).....	9
A Tribute to John Kraus, W8JK.....	10
W2RG Rover.....	10

Achtung

We like to print a new roster in one of the upcoming newsletters. Please let us know by e-mail or postcard of any recent changes!

Get your antennas in shape before it gets real cold!

De N8ZM

The next meeting appears to come early this month, but, by golly, the 4th Friday is the 22nd. Usual place: the Olde Country Buffet near Centerville at about 7:30. There will be more discussion of the 1296 beacon progress, other possible beacon projects, and the 2006 Microwave Update opportunity. And as always, good conversation with good friends.

In the November QST, there is a plug for the next Frequency Measurement Test, or FMT. It will be held on the evening of November 17 at 9:45 PM EST. Last year you may remember that several of us got together at John Ackermann's place to share a common antenna and frequency reference, each using different equipment and techniques for comparison. One dang fool even tried to go mobile. I haven't broached the idea to John yet about doing the same thing this time, but we can see what interest, ideas, and options are available to us at the meeting. The League's organizer for this event, H. Ward Silver (HI-Ho's cousin?...Sorry!), has created an interesting twist as W1AW will be transmitting an SSB signal with a single audio tone on it, and will tell you their carrier frequency. The task is to measure the TONE frequency, given that the carrier frequency is known. What he is trying to do is to illuminate the idea of where your signal energy is compared to your rig's frequency readout. It all sounds pretty simple, but at least we will get a chance to sharpen our math skills as well!

Microwave Update, or MUD, is going on in Texas as I write this, and Al Ward, W5LUA, told me he plans to announce there that we will be holding it here in the Dayton area in 2006. I think this is a great opportunity for MVUS to enhance our reputation in the Midwest as an active, multi-talented group of radio enthusiasts. It also will be a bit of a challenge, as there will be a lot to organize by then. We are up to the task, and I know you guys will all help out. Mike Schulsinger has already started looking into possible venues, and may have news on that for Friday's meeting.

Coming up are the Holiday's, of course, so we need to start planning our schedule for November and December. The 4th Friday in November is, as is often the case, the day after Thanksgiving. We usually have our meeting on that day, so I propose to do it that way again. Christmas is on Saturday, and the 4th Friday is therefore Christmas Eve, which probably shoots any thoughts of having the meeting/party that night. I propose an evening the following week, which covers the 29th through the 30th (Friday that week is New Year's Eve, which is most likely another bad choice). Please keep an eye on your schedules as they develop for December, and we can set the final date in November, but I wanted to start the thought process.

Don't forget that there is a regular Sunday morning net of MVUS members and that they monitor 144.280 MHz, although the primary frequency is 28.960 MHz. The net starts at 14:30 GMT (10:30 EDT) and lasts anywhere from an hour on up.

I think our approach to distributing Anomalous Propagation via the net is working out very well. I know it takes a little more work for Steve to set it up each month in both PDF and DOC formats, but I think it is overall a much easier way to get the word out. If you haven't tried it, please do so, and if Steve doesn't have your e-mail address in the distribution list, please send it to him at **K8UD@MVUS.ORG**. We only use it for sending out notifications relative to club activities, and do not provide the list to others.

While musing about the last paragraph, a thought popped into my head that was driven by a suggestion made by one of the members a long time ago. Each of us has probably accumulated quite a library of books, data sheets, manuals, etc, that are kept for reference, but not often read. Frequently, one of us will need to find some information on an old part, or dig up an old QST, ham radio magazine, whatever. I suspect that there is some overlap, but I am wondering if we could compile a sort of database, or at least a listing, of who has what documents that they might be willing to share with other MVUS members. The list could be kept on the MVUS web site, and would only be accessible to members; a benefit of joining MVUS! I don't expect any of you to sit down and write a comprehensive list of the contents of your personal libraries, but a just short list of things you have that might be rare and/or useful to others. If you guys think this is a good idea, we can work out the details at the meeting. The other possibility is to set up a mechanism to inquire of the other members if they might have something you are needing. There are reflectors that do this sort of thing, but I was thinking more of something just within MVUS. What do you think?

And I would be remiss if I didn't remind all of you to check to see if your dues are paid up. Even with the reduction in postage and paper costs from electronic distribution, we still have regular expenses for the web site and some Anom Prop's still go out by mail. We do want YOU for a member, so please keep your membership status current. Thanks!

Tom, N8ZM

This and That 10-04

- **Hurricane.** “The wildest thing was, I have a solid wood front door. But it has three recessed panels in it as a design. The hurricane was driving the rain so hard against the door that it pushed water through the seams in the panels and soaked my rug.” [Bob Milne]
- **Weird.** Count Zeppelin made presentations to groups of wealthy people to collect money for building an airship. As an introduction, similar to telling a joke here, he would rip a fat telephone book into several pieces. Now, a retired pastor from Oregon, ripped 39 books in half in three minutes. “Of all the books I have torn, I’ve found the Portland ones (1004 pages) tear better. [Weird News]
- **Over-Hydration** ...These days, because the importance of drinking enough water is understood, dehydration has become a less prevalent condition among runners, while over-hydration is more common. [Marjie Gilliam]
- **Perfect 914-610-914.** Believe it or not, Machine Design once published a pin-up poster: Miss Metric made her debut in a 1973 issue to acquaint readers with the push for adoption of the Metric System in the US. [Machine Design Magazine, Sep-04]
- **GroupThink.** Groupthink has been used to explain the fiasco at the Bay of Pigs and the Challenger explosion. And if I had to put money on it, I’m sure it played a role in the introduction of New Coke. [Lana Rucks]
- **Computers.** ...but computers are dumb, They don’t interact with us. A urinal at least knows we are standing in front of it. A computer doesn’t. [Barrie Gilbert]
- **Memory Storage.** Remember when we could store the entire bible on a 2x2 inch piece of film? It was called Microfiche and developed by NCR. Now you have DVDs that hold an entire movie and the Encyclopedia Britannica can be put on a couple of CDs. Here comes a new technique involving “nanodots” that promise to store 10 Terabits per square inch. At such densities, coin sized chips holding 5 Terabits each could pack the entire Library of Congress into “a pocket full of change” [Colin Johnson, Jagdish Narayan]
- **Exercise.** Americans are funny in their attitudes toward exercise. They’ll drive around the mall looking for a parking place close to the door, and then go to the gym and log miles on the treadmill. Or they’ll ride elevators and escalators, and then hop on the Stairmaster. [Marilyn Gardner]
- **Data/Bandwidth.** If the average DVD (a full length movie+) were uncompressed, it would take at least a year to download it over a normal telephone line. [Marshall Brain]
- **Problem.** Have a problem? Take a deep breath, that will bring oxygen to your brain and help you solve it! [Dr. Phil]
- **Body Efficiency.** A 150 lb. person only needs 1800 calories per day to stay alive at rest. But even when moving the body is incredibly efficient. A person running in a marathon (26 miles) only burns 2600 calories or about 100 per mile. [Marshall Brain]
- **Computer Manual.** The manuals that are supposed to help you understand are created by demented people who sleep during the day and stay up all night writing convoluted sentences while drinking mountain Dew and eating cold pizza. [Bill Husted, KQ4YA]

The Second Weekend (18/19 Sep-04)

Several of us 10 GHz plus operators gathered around **Northern Lake Michigan (EN74)** for the second weekend of the 10 GHz plus contest. Great hospitality was provided by K2YAZ. The weather was cooperative, and about as nice as it gets. Sunny, warm, and a slight breeze. Very low waves on the lake, and a hint of fall color on the horizon. WW8M, K3SIW, K2YAZ, WB9SPT, WB8TGY, WA8VPD, KF8QL and myself NE8I. We all (except KF8QL) had **24 GHz** as well as **10 GHz**. For Sunday, add N8KWX and K9GA in Wisconsin.

Saturday AM, woke up in K2YAZ's shack, and on 144.200 was hearing EM76 coming in pretty well. Tuning around, found several Ga and Al stations on 2M SSB. Then checked the microwave beacons, which were coming in pretty well. A really good sign for good propagation. First thing we did was check out our equipment, that it was working and on frequency; then we split into 3 rover groups. K2YAZ provided the coordination and updates. K3SIW and myself drove up to the tip of the Leelanau (EN75ee), and the rest of the group operated around Sleeping Bear. We made some really good contacts on the 10-24-47 GHz bands. WW8M drove up to Manistique (EN65) in the Upper Peninsula. About a 6-hour drive each way. Then add the rover stops.

Band conditions Saturday late PM across Northern Lake Michigan were the best microwave lake openings that I have ever experienced. On 24GHz, the band was open well past sunset. Found each other on the first call. Signals were pinning the s meters. WW8M says that I owe him a new s meter needle, as his is now somewhere in Lake Michigan. Sunday morning, signals and paths were up, but not as good as Saturday. WW8M worked WB9SPT for the longest 24 GHz 2 way, approx 80 miles s9+ signals, both ways. We probably could have worked much longer paths over Lake Michigan. K3SIW and myself both achieved 5 VUCC grids, on 24 GHz. This is the second year that this has been done. This stretch of Lake Michigan, offers many open Public Access Lake operating locations, and dune top, with tree free (RF sponges) horizons to the other side of the Lake, and to a limited extent, along the Michigan shoreline. Afternoon, we drove down the Lake Michigan Shoreline. Last operating location, was **the M22 scenic overview**, north of Arcadia (EN64vm). This is perhaps the top microwave rover location along the Michigan side of Lake Michigan. Good for car bound rovers, and portable rover stations. It is near the top of a big sand dune. Paved easy access, paved parking, picnic tables, and observation deck. No fees, permits, park rangers etc. 180 degree operating horizon, from Gary, In, to Manistique, Mi. N8KWX and K9GA provided the Wisconsin activity, from the Milwaukee area, about 150 miles away. Signal paths were so strong, that WW8M worked them using just the open end of a wave-guide transition, aimed across the Lake. I used a 15 dB horn, then a PWB log periodic antenna. WB8TGY and WA8VPD managed several **180+ mile contacts** across and down the Lake on **10 GHz**. On Monday I spent roving around the Traverse City area, looking for and trying out new possible microwave paths with K2YAZ. Several of the formerly good operation locations, need trimming e.g. are now overgrown, or have new buildings in the way. Next year, we are planning more of the same. See what else can be done. Possibly have one two or three full time propagation beacons. **Northern Lake Michigan** offers terrain, lake propagation and enough grids, with easy, convenient rover access, to make for interesting experimentation and contesting.

73, Lloyd Ellsworth Ne8i

10/3/04: AD6FP and W6QI Break the 47 GHz World Record!

(From W6QI's Microwave Radio Project Page)

On Sunday afternoon (9/19/04) during the 10 GHz and Up Cumulative Contest W6QI and AD6FP completed a 47 GHz contact over a 290 km distance to set a new world record. W6QI operated from Shuteye Peak DM07GI just south of Yosemite and AD6FP operated from Frazier Mountain DM04MS north of Los Angeles. W6QI had to brave 30 degree temperatures and snow for two tense hours while modifying the radio in order to complete the contact. Signal margins were >40 db on the W6QI end, so AD6FP sent his exchange by FM voice. Margins were about 8 db on the AD6FP end so W6QI sent CW to complete the QSO. The weather conditions were quite unusual for September with scattered rain showers in the central California valley between Shuteye and Frazier.

Station details: **W6QI**: 36" Cassegrain dish,

+10 dBm TX, 8 db NF, OCXO locked

AD6FP: 12" splash plate dish, +45 dBm TX,

4 db NF, Rb locked

HAMARAMA, the Packrats Flea Market (10 Oct, 2004)

By Gerd, WB8IFM

I went back to the Packrats (North of Philadelphia) after a number of years. There was the usual Sunday flea market, but the Saturday conference was skipped this year, the reason being the involvement in the EME conference in Trenton (8 Aug-04), NJ just down the road and the fact that no chairman could be found. Last years conference was such a success that it might have been too intimidating to try for a repeat this year.

The flea market was at a different location and much smaller than what I remembered. The trend is the same and compares to other hamfests I visited this summer. There are just too many and you cannot visit all!

There were only a handful of dealers and some microwave equipment at very attractive prices, but I already have so many irons in the fire, I looked the other way. Many hams had cleaned out their basement and tried to sell as much as they could. This is helped by the fact that a number of hams are in the old equipment restoration and collecting business. This old equipment is easier to work on when the eyes are giving you a problem.

I had a short list of items to look for and I did pretty well. I needed a wall plug that provided 9 VAC and those are hard to find. Guess what, the first wall plug I grabbed out of a junk box was exactly what I needed. With other items I had similar success and, of course, I also wound up with things that had no immediate application (hi).

The weather was super the entire weekend (8-11 Oct) and we enjoyed the drive through the Pennsylvania Mountains where the leaves were starting to turn. Our little Volkswagen ran the 550 miles on one tank of Diesel with ¼ tank still left (55mpg). However, the turnpike cost had gone up and added another \$ 15.50 each way!

Radioactive Summer

Comments by the Packrats Pres, Rick, K1DS, from the October Cheese Bits

PrezSez

This has been one of the most radio-active summers I have ever experienced, having roved in the ARRL June VHF, operated the CQ VHF, ARRL UHF, 10GHz, ARRL Sept VHF, attending the EME Conference and all the Packrat Board of Directors meetings, the White Elephant picnic, and now looking forward to October with Hamarama, followed by Microwave Update in Dallas. And it's been a lot of fun!

How did your summer measure up? Several Packrats are mentioned in the current issue of QST with their Es experiences during the July openings. There were lots of great contacts for those on the 10GHz weekends, and of course, all participants still enjoying the after-glow of the June effort on the mountain.

Our Hamarama plans are complete, thanks to Ed, WA3DRC and his magnificent crew. We need to continue to build our efforts, as the general hamfest attendance has been shrinking for all venues. Not only are these events a great opportunity to buy and sell, but also represent the only significant fundraiser for the club to support the mountain efforts, and other club operating costs. Let's have EVERYONE there for this event, to handle all the needed tasks of gate, parking, and vendors. Thanks in advance for playing your role. And just in case you may still need more info, check the Packrat Web site, or call Ed directly at 215-322-2105.

.....

"Chemistry 101 - The basics"

By Bryan Noonan
April 27, 2004

There's lots of chemistries out there when it comes to **batteries**...so which one's are which and what's so unique about them?

Non-Rechargeable Chemistries:

Alkaline - High energy density, medium weight in comparison to others, safely disposable in the garbage, 5-7 year shelf life, a wide range of prices but 'cheap' compared to rechargeables.

Heavy Duty / General Purpose- Don't be fooled by the sales at your local Drug Store. These are usually Heavy Duty batteries. Low energy density, lightweight, safely disposable in the garbage, 5-7 year shelf life, about 1/4 - 1/2 the life of an alkaline, very cheap.

Lithium - The non-rechargeable type. Very high energy density, 10-year shelf life, ideal for high drain devices because of its quick recovery, safely disposable in the garbage, fairly expensive compared to alkalines. Nearly twice the life of an alkaline in most applications, best in cold weather.

Oxy Nickel - A pretty unknown chemistry. High energy density, medium weight, safely disposable in the garbage, 5-7 year shelf life, better than alkaline in high drain devices, expensive compared to other chemistries.

Silver Oxide - Very high energy density, medium weight, safely disposable in the garbage, 5-7 year shelf life, a little more expensive than alkaline, longer lasting than alkaline.

Rechargeable Chemistries:

Li-Ion - Very high energy density, light weight, hazardous (recycle), 4-5 year shelf life, fairly expensive, self discharges slower than NiMH, about 300-500 recharges.

Li-Polymer - Very high energy density, very light weight, hazardous (recycle), 4-5 year shelf life, a little expensive, self discharges slower than NiMH, about 300-500 recharges.

NiMH - High energy density (about the same as Li-Ion), heavier than Li-ion and about the same as alkaline, hazardous (recycle), 4-5 year shelf life, more expensive than NiCad, self-discharges on shelf about 1%/day, about 500 recharges.

NiCad - Medium energy density, lighter than alkaline, hazardous (recycle), 4-5 year shelf life, less expensive than NiMH, self-discharges on shelf about 1%/day, about 1000 recharges.

Sealed Lead / Gel Cell - Low energy density, heavy, hazardous (recycle), 3-4 year shelf life, self discharges more than 1% per day, 200-500 charges depending on type.

Wet Acid (auto) - Low energy density, heavy, hazardous (recycle), 3-4 year shelf life, self-discharges slower than sealed lead acid batteries.

*For rechargeable batteries the shelf life specified takes into account that the batteries are recharged every 3 months or so to keep from self-discharging below the point that they will not take a charge any longer. Please note that temperature and humidity affects the self-discharge rate. The higher the temperature and the higher the humidity the faster the discharge rate will be. The ideal storage temperature for batteries is right above freezing (around 0 degrees C)

Used by permission, - Zbattery.com <http://www.zbattery.com/> (800) 624-8681"

1 MHz to 8 GHz Logarithmic Detector / Controller (Analog Devices)

Features

- RF Input Frequency Range: 1 MHz to 8 GHz
- Wide Dynamic Range: 60 dB
- High Accuracy: ± 1 dB with 55 dB range
- Temperature Compensated:
0.00377 dB/ $^{\circ}$ C (-25 to +25 $^{\circ}$ C)
0.00106 dB/ $^{\circ}$ C (+25 to +85 $^{\circ}$ C)
- Integrated On-Chip Temperature Sensor 2 mV/ $^{\circ}$ C
- Fast Response: 8/13 ns (fall/rise time)
- High Output Current Driver Capability
- Single 5V Supply with Power Down
- Small 4mm x 4mm 16-Lead LFCSP Package

General Description

The AD8318 is a highly integrated wide dynamic range SiGe Logarithmic Amplifier. The device provides a temperature compensated output voltage for input frequencies from 1 MHz up to 8 GHz.

The AD8318 is based on the proven AD8313 logarithmic detector architecture, with the advantage of improved accuracy and temperature stability for RF inputs up to 8 GHz.

The device has been specified for use at the cellular 900 MHz, 1900 MHz, 2.2 GHz frequencies, and at 3.6 GHz, 5.8 GHz, 8 GHz frequencies.

The AD8318 can be used in measurement mode for a DC equivalent output voltage, or in controller mode where a set point control signal is applied to the VSET input, and the VOUT signal is used for gain or attenuator adjustment in an output power control application.

The AD8318 provides exceptional temperature stability across the complete input frequency range. A single external resistor, set by the user, optimizes the temperature compensation to the desired input frequency. In addition to the internal temperature compensation, the AD8318 provides an output voltage that is proportional to absolute temperature calibrated 2 mV/ $^{\circ}$ C.

The output stage provides a high output current drive capability and a rapid output response time.

The AD8318 is specified for operation of a single +5V supply, packaged in a space saving 4mm by 4mm 16-lead LFCSP and fully specified over -40 to +85 $^{\circ}$ C temperature range.

Availability

Samples and evaluation boards are available. AD8318-EVAL Evaluation board,

AD8318ACPZ Generic order code

The Devil is in the Details

(Distribution of amplification, AGC, and lightning protection)

The block diagram of a transponder is simplicity itself. However, if you start putting numbers on the individual blocs for the signal levels, it becomes clear that multistage amplifiers would be needed. The more stages you need at the same frequency, particularly at microwave frequencies, the more there is a chance for feedback. It might be of advantage to convert the input signals to an IF frequency first. This would involve just one extra mixer.

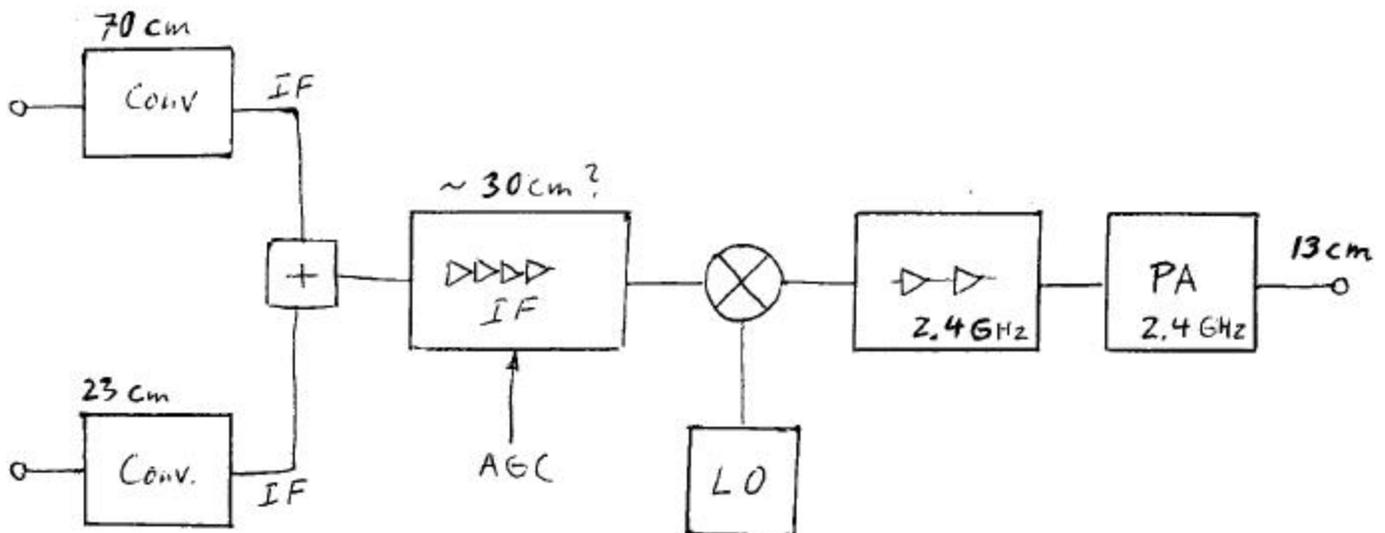
Another requirement pops up also: because there are multiple input signals of variable strength, it is impossible to predict an exact input level, one can only arrive at a range from weak to very strong and from a couple of signals to dozens. This then requires a **gain control circuit**, which could be part of the IF amplifier strip.

In one aspect, space is a benign environment: there is no weather. There are no storms, no lightning, no rain or snow. However there are other things to worry about: like harmful radiation, heat and cold and the vacuum.

So on earth we better look into a good design against lightning as the biggest threat. And, of course, temperature variations, depending on the exposure of the transponder, need also be considered. A lot of info on these subjects should be available from the hams that have built and/or operated repeaters.

Below is a diagram of the "alternate" transponder.

10-04
WB8IFM



"Alternate" MVUS - Transponder

John Kraus, W8JK, became a silent key on July 18, 2004. He was 94 years old and had been in poor health for some time, but he was mentally active to the end.

During his career in electronics and radio astronomy he wrote 146 articles starting with "Some Characteristics of Ultra High Frequency Transmissions." In 1933 to "Radio Telescopes." in 1995. He also wrote six books dealing with electromagnetics, antennas (his specialty) and radio astronomy. The book titled: "Big Ear" describes his life's work and that of students and scientists he worked with. It is well worth reading.

The second edition from 1995 also gives some of his insights and life's experiences. John was a conservationist and cared deeply about nature. In his final years he became a philosopher.

I want to conclude with a quote from his chapter 32 of "Big Ear 2". It begins with a preface by Albert Schweitzer: "Man has lost the capacity to foresee and forestall. He will end by destroying the earth." To which John adds: "We tend to sit fat, dumb and happy". And he ends the chapter: "I love Planet Earth and all of its marvelous diverse living passengers including that biped Homo sapiens. I only hope we get our act together in time, because good planets are hard to find! We have a good one. Let's keep it!!!"

[Gerd, WB8IFM]

W2RG/Rover June 2004 VHF QSO Party results

The recent VHF QSO Party turned out to be a good one for W2RG/Rover after a somewhat shaky start. Not outstanding, but lots of fun.

On Saturday, W2RG (Rich) and K8CO (Rob Rogers) began the contest at 14:00 EDT near Maysville KY (EM88) by sitting out a thunderstorm for almost one hour. When the lightning had moved on and the wind and rain had subsided, we set up our gear:

50 MHz, M-squared half-wave loop, 100 W, up about 12 feet
432 MHz, M-squared 11-element yagi, 30 W, up about 10 feet
144 MHz, Cushcraft 4-element yagi, 50 W, up about 8 feet.

I held off setting up the 10-GHz (1 W, 60-cm dish) rig until we got some activity.

We heard nothing for the longest time. Finally, we called CQ (rovers aren't supposed to do that, are they???) and W4FVQ came back. We worked all three bands. Then worked K8LEE on 50 MHz. Then got more silence.

Not wanting to fall too far behind our roving schedule, we pushed on to locations in EM78 and then EM79. Activity picked up steadily. 50 MHz opened up to the Gulf Coast, where we worked stations from south Florida across to Texas, and even ZF1DC in EK99 (Cayman Islands) and T49C in EL82 (Cuba). K9AYA provided two solid 10 GHz contacts while we were in EM78 and EM79. Hunger got the better of us at about 19:45, so we packed it in, even though 6 meters was still going strong.

On Sunday, W2RG went solo starting in EN70 at about 10:00 EDT. 50 MHz was still open to Florida, but the 10 GHz stuff proved to be the high point of the day. K9AYA provided 10 GHz contacts (and 144 and 432 MHz) while in EN70, EN80, and EM89; and N8VZW came in on 144 MHz and 10 GHz in EN80 and EM89. Then, while in EM89, K4EFD appeared from EM78 near Borden IN on 144 MHz and 10 GHz. This gave W2RG a new personal 10GHz longest path of 138 miles.

In addition, big contributors to the log for multiple grid squares and multiple bands were W4FVQ (Dennis), W8ULC (Red), and N8ZM (Tom). After a bleak, wet beginning, the weekend was a great time. (Everyone else, wish you were there!)

73, W2RG, Rich