

CHEESE BITS



W3CCX SCANNED TO PDF BY BERT, K3HUV, 2013

CLUB MEMORIAL CALL



ARRL
Affiliated
Club

VOLUME XLI

October 1999

Number 10

The PREZ SEZ

Wow, there is a lot happening as we speed into fall. In a blur, the September contest and the new fall Sprints are speeding by.... There seemed to be good activity in the September contest, at least the half (Saturday) that I operated. I hear there was a good aurora Sunday that I missed, and that probably added some good grids to the tally. Remember to send in your logs. This should be easy for computer log users. The hardest part is remembering to email before the cutoff date. I sent in my September QSO party log via Email. It would be nice to get a confirmation back that the league received it. I guess they will eventually advance the technology to put our minds at ease!

The conference was once again a well received event. Many familiar faces /voices / calls arriving either at the hospitality night or the next morning. It was obvious that interest in all of the talks was high because the speakers were able to hold the interest of the attendees, without losing many to hallway or parking lot conversations. Thanks to John for putting together an interesting lineup of speakers again this year. And of course our thanks to the Speakers who activated the masses.

Great weather greeted us at the new Hamarama site. What a difference from last year! I brought that rain slicker, knowing I wouldn't need it, but I didn't want to jinx the event. It was the first year here after the demise of the old drive-in, and not the easiest place to find. Attendance was real good and hopefully some good treasures were acquired to add that new band. Thanks to our chairman, Mark and Bob, for making this transitional year a success.

With the main club fund raising event behind us this year, it is now time to get into contest preparation mode. The weather is perfect now for making those outside improvements. Early assistance requests to the contest committee are appreciated. Hopefully the remnants of hurricane Floyd didn't generate too much damage.

Don't forget this years Leonids shower, perhaps storm. I hope it happens again, as last year the peak made 2 meters seem like a weekend afternoon on 20 meters. This year could be as good or better! The predicted peak is on November 17 this year. A great information link is: http://science.nasa.gov/newhome/headlines/ast22jun99_1.htm

Ed, WA3DRC

MEETINGS

Third Thursday each month at 8:00 PM
Southampton Free Library
947 E. Street Road
Southampton, PA 18966

Pack Rats **CHEESE BITS** is a monthly publication of the
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PACKRAT 222 MHz REPEATER - W3CCX/R

222.98/224.58 MHz, Churchville, PA FN201E

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PACK RAT BEACONS - W3CCX/B

FM29JW Philadelphia, PA
 50.080 144.284 222.065 432.295 903.072 MHz
 1296.251 2304.037 3456.220 5760.190 10,368.170 MHz

MONDAY NIGHT NETS

<u>TIME</u>	<u>FREQUENCY</u>	<u>NET CONTROL</u>
7:30 PM	50.150 Mhz	WA3EHD/K3EOD
8:00 PM	144.150 MHz	N3ITT
8:30 PM	222.125 MHz	W2SJ/N3EXA
8:30 PM	224.58R MHz	W3GXB
9:00 PM	432.110 MHz	W3RJW/WA3DRC
9:30 PM	1296.100 MHz	WA3NUF
10:00 PM	903.100 MHz	N3AOG

COMMITTEE CHAIRMEN

LADIES' NIGHT: N3AOG 215-443-9965
 JUNE CONTEST: N3ITT 610-847-5490
 HAMARAMA: NK8Q 610-847-2285
 VHF CONFERENCE: KB3XG 610-584-2489



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CALENDAR OF COMING EVENTS - OCTOBER 1999

- 2 **23rd Annual Mid-Atlantic VHF Conference** will be held at the Hampton Inn in Willow Grove, PA. 1-215-659-3535. Contact John, KB3XG at johnkb3re@aol.com for further details or check the Mt. Airy VHF Radio Club web page at www.IJ.net.Packrats.
- 3 **HAMARAMA '99** will be held at the Middletown Grange Fairgrounds in Wrightstown, PA. TI on 146.52.
- 9-10 **PA QSO Party.** See Oct. QST page 86 for rules.
- 14 **Packrat Board of Directors meeting** at the QTH of Bob, N3XEM at 8:00 PM. All interested Parties invited. Call 215-822-0779 for directions.
- 17 **RF Hill Hamfest** at the Sellersville Fire Hall in Sellersville, PA. TI on 145.31. <http://www.rfhill.ampr.org>.
- 21 **Packrat general membership meeting** at the Southampton Free Library on Street Road in Southampton, Pa. at 8:00 PM. All club members and VHFers invited.
- 21-24 **Microwave Update '99** will be held in Plano, TX. Contact Al, W5LUA at 972-562-6018 or Al_Ward@hp.com for further info. Packrats Paul, W2PED and John, KB3XG will be giving a talk.
- 28 **LEAP INTO THE MICROWAVES** with the Packrats! 903 and above. Every 4th Thursday of the month operate from 8 to 10 PM local time on any band 903 MHz and above. For coordination on those difficult long haul contacts 144.260 MHz is the suggested liaison frequency. So here's your chance to fix what broke in the contest and work all those stations you missed.
- 30-31 **ARRL International EME Contest.** See Sept. QST page 114 for rules.

SWAP SHOP:

(send all ads to the editor)

FOR SALE: CALLSIGN HISTORY. Name and address of each holder since 1912. Cost \$15 plus SASE for printed CERTIFICATE. Wanted CallBooks before 1970 and QST's before 1940 will buy or trade. Also looking for 1x2 Ham Radio License Plates for my collection. Ron Allen W3OR, PO Box 73, Bethel, De. 19931-0073 or call 302-875-1100.

FOR SALE. Lynne Graves, daughter-in-law of Hal, W3HFY still has many items left from Hal's estate. See the August issue of Cheesebits for an extensive list of items. In addition to that list there is also a Kenwood TS700S 2 meter rig and a Yaesu FT726R triband multimode rig with 50, 144, 432 MHz modules and a satellite module available. Most Icom rigs including VHF thru the IC765, IC775, and IC781 HF transceivers are available. Call Lynne at 610-258-0231 and negotiate a rig.

TID BITS

Check the latest happenings of the Mt. Airy VHF Radio Club by checking our web page at <http://www.ij.net/packrats/>.

VUCC Award Checking: If you want QSL cards checked for your initial VUCC Award or an update, contact Harry, W3IIT at hbrown@voicenet.com or 610-584-4846. I'll do updates (up to 25 additions) at regular club meetings.

New VUCC Awards: 50 MHz, 200 grids for Craig, K3CWH and 225 grids for Harry, K3HZO and 125 grids for Kay, WT3P, the ARRL Atlantic Division Director.

The Oct/Nov issue of **Feed Point**, the newsletter of the North Texas Microwave Society includes articles on: Notes on Cooling PHEMT Amplifiers, KILPS's Notes on the Easy Verter for 10 GHz, and a reprint of The Crawford Hill VHF Club Technical Report #20, Method for Estimating Receiver Noise Temperature.

23 rd Annual Mid-Atlantic States VHF Conference/Hamarama '99

First, my thanks to the chairpersons for both events!! Both events were well attended, and from all inputs I have received, the weekend was both informative and fun. Of course the events could not run without the support of others. It was good to see many club members at both events, and the hospitality night prior to the conference.

These events only run smoothly with good club participation and planning. We were a little light on planning this year, in part due to the cancellation of the meeting due to the hurricane. As a result, a little tactical "enhancement" was required on hamarama game day. Thanks to all who helped pull in the reins, you know who you are!

I have word from NK8Q that we have locked down the grange site for next year. With the first year under our belt, and microwave update coming here next year, we should expect a great event next year also.

Thanks again to all who helped out, Ed, WA3DRC.

23 rd Annual Mid-Atlantic States VHF Conference Report

de, John KB3XG

The 1999 Pack Rat Conference was a huge success. Things started out right with the Friday night hospitality suite. About 30 VHFers showed up for drinks, snacks, and to share battle stories.

On Saturday we had 71 people in attendance with a record 9 technical presentations. Topics ranged from roving to home brewing and operating. Brian, ND3F was brave enough to take the after dinner speaker slot. (You know how hams are after a few beers.) Also for the 1st time we were on schedule. This was due to an idea from W3RJW. Ron suggested that we give prizes away during the day as bribes. This got everyone back in their seats by 12:50 pm sharp. Ron said "It's amazing what hams will do for a \$10 watch."

The Pack Rats hosted another hospitality suite before the evening banquet. We were told by the hotel management that alcohol was not allowed in the lobby or conference rooms. Alcohol was permitted in the board room across the hall under the condition that no more than 5 people at a time could be drinking. This rule was strictly enforced by our Beer Captain Phil, WA3NUF and the Hard Liquor Lieutenant Will, K3PHY.

N3AOG's workplace neighbor again provided food for lunch and dinner. There was plenty of food for all. I finally found out how Dick gets such a good deal on the food. He promises to clean up the pots and pans afterwards. And I don't mean just squirting things off with water. He and Janice were up until midnight wrestling with Brillo pads.

Harry, W3IIT and Gary, WA2OMY were absent this year but without these guys working months in advance, the prize table would have been empty. Harry worked on a little Excel spread sheet that helped track prizes and prize donors. Everyone went home with a prize, some worth well over \$500.

W3RJW was able to steal a "good" PA system from work. I was told that he was there at 7 am setting things up. The club owns a little 5 Watt squawk box that works OK, but in a large room, it really makes a difference to have a decent system.

Poor Dave, W3KM and Gene, KB3IB were stuck out in the lobby all day taking money from people. These guys are there every year but miss the presentations. Next year I will attempt to employ some Pack Rat XYL's for this task.

Lastly the "Tech Room" was a big hit. Guys brought in boxes full of mystery circuits with connectors. Paul, W2PED, Lenny, N3NGE, and Gerry, SSB Electronics manned the equipment throughout the afternoon trouble shooting problems and making friends. Lenny says we should do this sort of thing a couple times a year at a regularly scheduled club meeting. I think that's a pretty good idea.

As Fred Sanford used to say, "It's the big one Elizabeth" Next year we are hosting Microwave Update. This is a 4 day event (Sept 28th to Oct. 1) including Hamarama on Sunday. We had great club participation this year but we will need even more planning and help next year. I know all of you guys will really like Update. I will try to set things up in advance so we can sit and enjoy the entire weekend. (Hamarama excluded.)

Thanks to everyone for making it a great Conference and Hamarama weekend. de: KB3XG

The Triode Board

de, Ian, G3SEK

The Triode Board is a new solution to the control and protection of triode power amplifiers. It follows the same successful formula as G3SEK's Tetrode Boards: all the necessary control, protection and metering circuits on a ready-made PC board, along with a comprehensive User Manual and on-line support.

The Triode Board is configurable to use with almost any amateur-size grounded-grid amplifier, and has been tested on a wide range of triodes. More details on the web site! The kit includes a double-sided PC board with printed component locations, all the components for the PC board and the 38-page User Manual. Experienced constructors can buy the bare board and the User Manual, which includes a complete parts list.

For details of the Triode Board and Tetrode Boards, visit <http://www.ifwtech.demon.co.uk/g3sek>. Triode Boards are available NOW from G3SEK. In the USA, Triode Boards and kits will be available in mid-October from Down East Microwave, Inc at (908) 996-3584. 73 from Ian G3SEK, Editor, 'The VHF/UHF DX Book' 'In Practice' columnist for RadCom (RSGB).

CHEESEBITS SUBSCRIPTIONS

Cheesebits subscriptions are available to everyone interested in activities and information from the VHF through the microwave frequencies. Subscriptions are for 1 year of 12 issues. For a subscription, send the following information:

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October 1999

Send to: SUBSCRIPTION/ADVERTISING MANAGER

Bob Fischer, W2SJ, 7258 Walnut Avenue, Pennsauken, NJ 08110

TROPO 101

By William Hepburn, hepburnw@total.net

Editors note: Will has started putting tropo forecasts on the Weak Signal VHF Reflector. This posting of Will's (with his permission) is in response to requests for further info on Tropo propagation. Hope his explanations help all.

Will's posting: By no means am I an expert on propagation modes, but I had a fellow ask me about some of the tropo modes and thought that this might be a chance to give a quick rundown on the modes for those perhaps not completely familiar with the differences between them.

At 1999-09-27 12:09 AM, TIA of the WSVHF list wrote: I wonder if you know where on the web I can get a good explanation of the similarities & differences among all the similar sounding propagation modes like tropospheric ducting, tropospheric scatter, tropospheric enhancement, back scatter, side scatter, normal scatter, etc. Or you can explain it if you don't know of any web pages. I'm familiar with aurora, Es, F2, knife edge diffraction, rain scatter for 10 GHz, etc. But some of the modes sound like they must have very small differences between them, and that's where the confusion comes in for me. TIA.

The modes are defined by the mechanics behind them. A Tropo DX mode is any condition that scatters, reflects or refracts signals in the Troposphere allowing DX to occur. Refraction occurs when the normal Index of Refraction has been altered (boundaries between different types of airmasses usually cause this). Enhancement and ducting in particular form a grey line. As a rule of thumb, Enhancement is DX via inversions below 1500 ft above ground. Ducting is DX via inversions above 1500 ft. (The layer of the troposphere below 1500 ft is called the "boundary layer" in meteorology).

Tropospheric V/UHF DX Modes:

Line-of-Sight (GW) is normal continuous reception where the receiving and transmitting antennas can see each other taking into account the 4/3 Earth curvature of radio waves.

Tropospheric Scatter (TrS) is ever-present under normal conditions. That's the mode that produces the distant fluttery signals that randomly fade in and out. These are your most distant regular stations that barely make it in. Depending on your location and equipment. Tropo scatter can extend to 200, 300 or even 400 miles. The theoretical maximum limit is 500 miles. Scatter is caused by small particles/droplets in the air such as haze, dust, clouds, etc.

Tropospheric Enhancement (TrE) (aka Tropospheric Refraction) is common under normal conditions. On most clear nights the ground radiates and the air near the ground cools. Eventually an inversion is formed and stations that normally fade in and out via tropo scatter come in continuously with increasing strength. Also weaker tropo scatter stations that are normally not heard (because their signal strengths never cross the background noise threshold signal level) also begin to appear. When the sun comes up, the ground & air heats up, the inversion breaks down and the enhancement disappears. The enhancement is subtle on some nights, and very obvious on other nights. Distances are no different than your tropo scatter catches; it's just that the signals are stronger. Tropo enhancement is greatly influenced by terrain. From a DXers point of view, multiple directions usually are enhanced at the same time.

Tropospheric Ducting (TrD) is an abnormal condition. An inversion has formed at a much higher level above the ground. This inversion is not formed due to nighttime radiation/cooling but rather because of some other weather phenomenon (high pressure subsidence aloft, warm frontal boundary, cold frontal boundary, oceanic or lake inversion, Chinooks, etc). Because of this ducting can occur day or night (though it strengthens at night) is not normally influenced by terrain (East of the Rockies) and from a DXers point of view is normally either uni- or bi-directional. In fact, typical ducts are sharply directional. Distances are theoretically unlimited. One large area can have multiple ducts going on simultaneously but they are usually parallel paths. It is possible in a very strong high pressure system to have large areas of ducting creating multi-directional openings. These are the rare "blockbuster" openings that make DXers mouths water.

Special Cases:

Rain Scatter (RS) is a rare mode that sometimes occur on the higher UHF-TV channels. A band of very heavy rain (or rain and hail) at a distance can scatter or even reflect signals. The effect is the one used for microwave Weather Radars. Distances are typically around 100 miles, though up to 400 miles is theoretically possible. (Note that heavy snow is not a useful reflector).

Ice Peller Scatter (SS) (called Sleet Scatter in the US) is similar to Rain Scatter but is caused by bands of Ice Pellets in the wintertime.

Aircraft Scatter, (AS) (aka Tropospheric Reflection) is simply reflection off of aircraft although reflections off of flocks of birds are also possible. A rare form of reflection is "Chaf Scatter". Chaf is strips of metal foil sent out by the military during training exercises. Chaf helps to confuse enemy radars, but also helps to produce DX. Maximum distances for all reflection modes are again up to 500 miles.

Lightning Scatter (LS) is a mode that is sometimes discussed but there is little documentation on it. The theory is that lightning strikes produce ionized trails. Reception is similar to other forms of scatter except that the DX is more burst-like similar to MS. LS is a mode that is very hard to distinguish and rarely reported.

Reflections off of hills and mountains and Knife-Edge Diffraction are not considered true DX modes since they are omni-present, though they can help to extend DX via the other modes.

Backscatter and Sidescatter are terms normally used when describing ionospheric DX.

As far as forecasting Enhancement vs Ducting, the reason that I stick with just Ducting is because it is a large-scale phenomena can be put down in a forecast in a reasonable amount of time and produces the best tropo. Enhancement is forecastable but it is so dependant on regional and local terrain and conditions that it would be a labour-intensive effort (not to mention a very lengthy one) to forecast for all of North America. The process that one would have to use to properly forecast Enhancement for a particular area is the same that a meteorologist would use to forecast overnight low temperatures, chance of fog patches, etc.

I hope this helps out a few DXers out there. 73s, Will.

MILLENNIAL CUMULATIVE MICROWAVE CONTEST

Sponsored by N.E.W.S.

Purpose: to encourage microwave activity year round

Goal: to work as many stations in as many grids as possible, and to encourage new microwave operators

Period: January 1, 2000 through Dec. 31, 2000

Rules:

1. A station may be worked once in each 4 digit grid square on each band above 900 MHz from any 4 digit grid square in any calendar month. In subsequent calendar months, station X may again contact station Y in the same 4 digit grid square as long as at least one of the two stations has moved 10 miles or more from any previous location. For example if W1GHZ logs a contact from FN42 with N1SAI in FN33 in January, then in February, W1GHZ may again log a contact from FN42 to N1SAI in FN33 as long as one or both stations have moved 10 miles or more from the locations used in January.
2. Either station may move to another 4 digit grid square for additional contacts.
3. Exchange is 6 digit grid square, or 4 digit square with penalty. If an operator doesn't know what planet he is on, it doesn't count.
4. All contacts must be at least one kilometer and between different 6 digit grid squares, with the exception of a station's initial contact on a band, which may be any distance. All modes are permissible.
5. Grid circling and other manufactured contacts are prohibited. If it feels like a manufactured contact, don't do it.
6. There is no rule 6.
7. Any form of liaison is acceptable: lower frequencies, Internet, telephone, cell phone, semiphone or whatever.
8. Equipment may only be used for one call sign per calendar month, except for members of immediate family. Thus a spare rig may be loaned out to different operators, but only one operator per month. (A new vanity or upgraded callsign is the same operator).
9. Cooperation and amateur spirit are encouraged. This ain't a DX contest.
10. Any mode that allows exchange of information is permitted, within rules of FCC or other licensing authority.
11. Have fun!

Scoring:

1. Each contact scores one distance point for each kilometer distance between the 6 digit squares as calculated by the BD program.
2. If only 4 digit grid square is exchanged, then distance is calculated to the corner 6 digit square which produce the smallest distance.
3. EME contacts use terrestrial distance if grid squares are exchanged, as above. If only TMO reports are exchanged, then the contact is scored as 500 distance points.
4. Multiplier: Each unique combination of 4 digit grid squares between which a contact is made is a multiplier of one for each band below 24 GHz, and a multiplier of two for bands at 24 GHz and up. All colors of light count as one band.
5. Bonus points: Each new callsign worked scores 100 bonus points. If a station changes callsign during the year, each may be counted. (This relieves other stations of keeping track of all the vanity changes).
6. New band bonus. Any contact made on a band where the operator has never ever made a contact before scores an additional 1000 bonus points. This means once in a lifetime for each band.
7. TOTAL SCORE=distance points X multipliers + bonus points.

LOGS: should be submitted by 31 January 2001 to N.E.W.S. Summaries will be posted on the internet as received so you know the logs aren't lost. The internet site will allow interim results to be posted during the year to encourage activity.

AWARDS: The highest total score in North America will receive a gaudy trophy. If there is a higher score in the rest of the world, a second trophy will be awarded. Second through fifth place entries will receive a plaque, and sixth thru tenth places will receive a certificate (unless more plaques are sponsored). All entries will be listed on the internet.

24 GHz SCALER FEED AND MOUNT

For the DirectPC or Prime Star Dishes

By Chuck Swedeblom, WA6EXV

The existing feed on the two dishes provided a measured efficiency of 60% at 10.368 MHz. I decided to explore the possibility of using the dishes at 24 GHz and built this feed to fit in place of the original one. Since my antenna range is too small (92'), WA6QYR and I located two sites about a half mile apart on two sides of a small canyon to conduct these tests using an antenna of known gain. The results of these tests showed that the DirectPC antenna had an efficiency of 59% using this feed at 24.125 GHz. The original tests on the Prime Star dish did not perform this good, but the Prime Star dish was used and had been installed here in Ridgecrest for two years or more, whereas the DirectPC dish was brand new. Also, there is some doubt in my mind that the Prime Star tests may be flawed. Further tests of the Prime Star will be conducted in the near future.

I built the Scaler Feed as shown, since I have the tools and enjoy turning and milling metal. I have also built the calder section using 1/16" G10 or FR4 PCB material and thin hobby brass strips to form the rings with equal results. In this case the 1/2" brass tubing (circular waveguide) would extend through the center of the scaler and would have to be long enough to allow for mounting, a total of about 3.5". Also the mounting technique has to be modified such that the center of the feed will be at the same location as the present one. I used a brass strap soldered to the 1/2" circular waveguide and bent such that the alignment was correct and then drilled two 1/4" holes in the strap to bolt it to the mounting arm of the dish.

(From the September issue of the San Bernardino Microwave Society Newsletter)

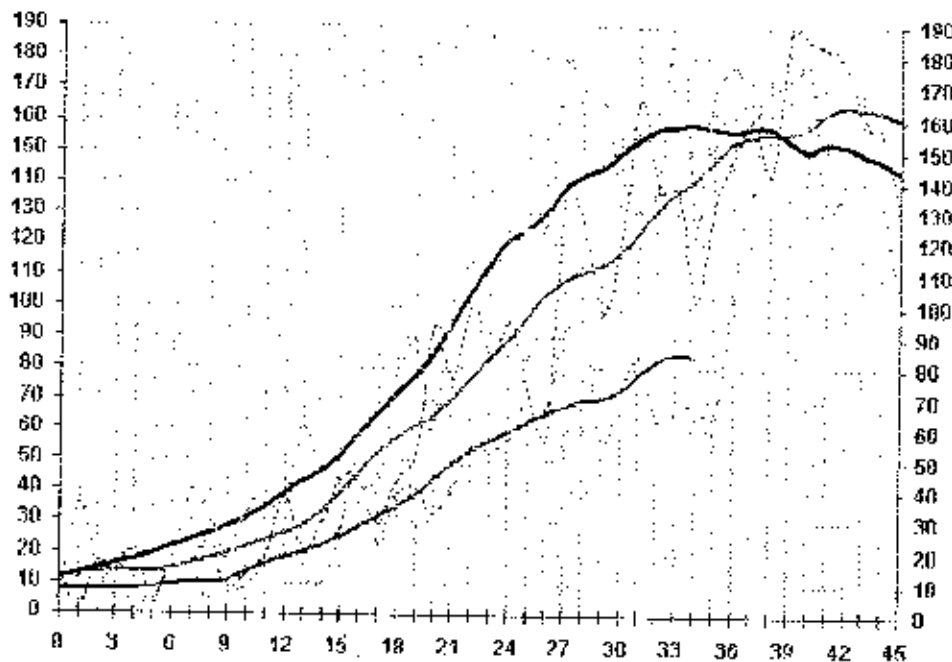
A GRAPHICAL COMPARISON OF SOLAR CYCLES 21, 22 AND 23

Solar cycle 23 was originally predicted to reach the same magnitude as cycle 21. A peak somewhere between 95 and 130 is more likely based on the development of cycle 23. Cycle 22 is not a good comparison due to the unusually short time it took to reach its maximum. Other cycles compare better to the development of cycle 23. The X axis in the chart is the number of months since the cycle started, while the Y axis is the sunspot number.

The bottom solid line is the monthly smoothed sunspot cycle for current cycle, 23.

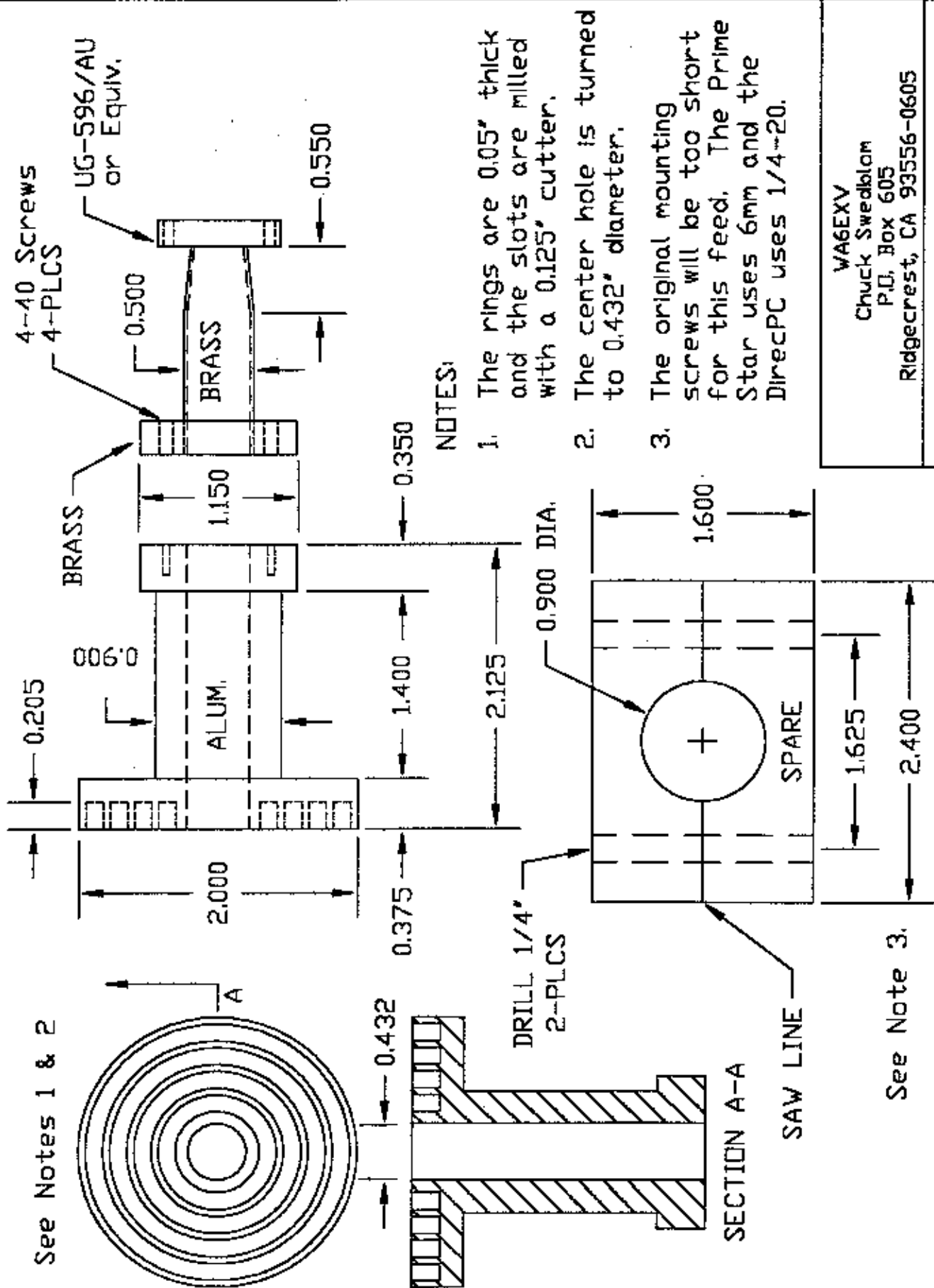
The top (as starting from the left) solid line is the monthly smoothed sunspot cycle for 22.

The middle solid line is the monthly smoothed sunspot cycle for cycle, 21.



- Cycle 21 started in June 1976 and lasted 10 years and 3 months.
- Cycle 22 started in September 1986 and lasted 9 years and 8 months.

See <http://www.dxlc.com/index/html> for updated data



NOTES:

1. The rings are 0.05" thick and the slots are milled with a 0.125" cutter.
2. The center hole is turned to 0.432" diameter.
3. The original mounting screws will be too short for this feed. The Prime Star uses 6mm and the DirecPC uses 1/4"-20.

WA6EXV
 Chuck Swedblom
 P.O. Box 605
 Ridgecrest, CA 93556-0605

24GHZ SCALER FEED AND MOUNT
 For the DirecPC or Prime Star Dishes

Date: B-12-99 Sheet:

See Note 3.

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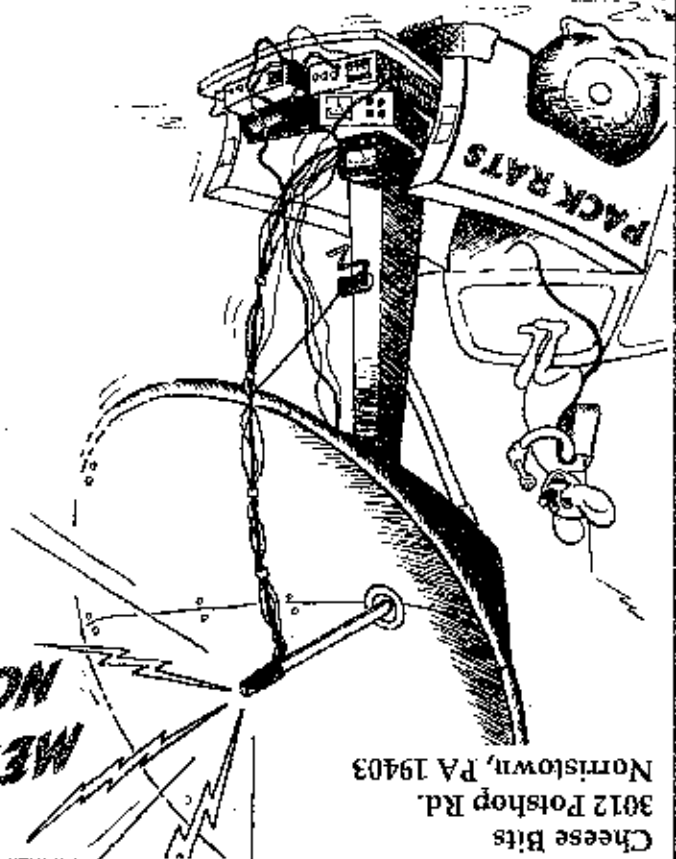
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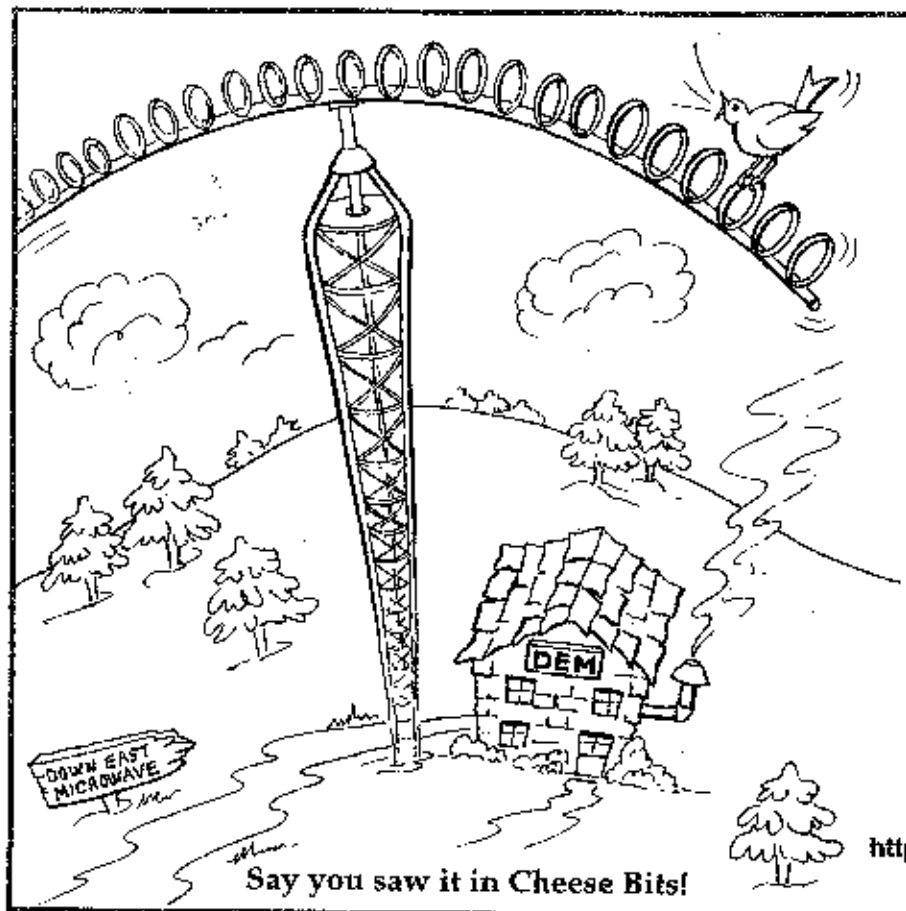
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