

CHEESE BITS



W3CCX

CLUB MEMORIAL CALL



ARRL
Affiliated
Club

SCANNED TO PDF BY BERT, K3RUV, 2013

VOLUME XXXIX

July 1997

Number 7

THE PREZ SEZ

It is indeed an honor to once again be president of what I, and many others consider to be one of the very best radio clubs in the world. Its hard to believe that over twenty years have passed since I was last president of the Pack Rats (1974-1976).

Many things have changed in the club, yet many things remain the same. It's that balance between tradition and change that makes this organization so strong. Dwell too long on either extreme and a radio club, just like a nation, will be soon gone. Sure we still cling to the old, like the picnic, ladies night and dragging perspective new members out in the hallway during voting. (That's so that they would never know who was that single vote that kept them from becoming a Pack Rat.) Has it ever happened? Not to my knowledge, but the possibility does add bit of intrigue to the membership process don't you think. Wonder who the founding fathers had in mind when they thought that up. Did you know the Pack Rats have a Web page? That just about every member uses computer logging in the contest. Members use the latest in technology in the construction of microwave equipment. Balance between the old and the new is a key ingredient in any organizational recipe.

Thanks to WB3JYO and KB3XG for their excellent presentation and demonstration on their 24 GHz project. Narrowband stations on 24 GHz is quite an accomplishment. Although only 3 dB higher in frequency than 10 GHz, but I think its about 20 dB harder to pull off.

The July meeting is a tradition favorite of many and once again will be at the QTH of WA2OMY in Trooper, PA. It is of course the White Elephant Sale. Bring some 'stuff' along for sale. You won't make much money, but then again you won't spend much either.

73, Ron, WA3AXV

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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SUBSCRIPTION/ADVERTISING MANAGER:

Bob Fischer, WB2YEH
7258 Walnut Avenue
Pennsauken, NJ 08110
(609) 665-8488

EDITOR:

Harry Brown, W3IIT
3012 Potshop Road
Norristown, PA 19403
(610) 584-4846
hbrown@vf.lnms.lnco.com
hbrown@voicenet.com

CLUB TREASURER:

Dave Mascaro, W3KM
1603 Mink Road
Ottsville, PA 18942
(215) 795-2648
dmascaro@gic.gi.com

AWARDS CHAIRMAN:

Bob Fox, W3GXB
(610) 346-8698

TRUSTEE OF CLUB CALL - W3CCX

Ron Whitsel, WA3AXV
rwhitsel@aol.com
(215) 355-5730

PACKRAT 222 MHz REPEATER - W3CCX/R

222.98/224.58 MHz, Churchville, PA FN20LE

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PRESIDENT:	WA3NUF	Phil Miguelez, pmiguelez@gic.gi.com
VICE PRES:	N3AOG	Dick Comly, 104242.2614@compuserve.com
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COR. SECR:	KB3XG	John Sorter, JohnKB3XG@aol.com
DIRECTORS:	N3DQZ	Jack Kauker (2 Yrs) jkauker@voicenet.com
	WA3AXV	Ron Whitsel (2 Yrs) rwhitsel@aol.com
	N3OZO	Don Schwartzkopf (1 YR)
	WB3KRW	Steve Dallas (1 YR) sdallas@erols.com

MONDAY NIGHT NETS

TIME	FREQ.	NET CONTROL
7:30 PM	50.150 MHz	K3EOD
8:00 PM	144.150 MHz	N3ITT/AA2UK
8:30 PM	222.125 MHz	WB2YEH/N3EXA
8:30 PM	224.58R MHz	W3GXB
9:00 PM	432.110 MHz	WA3AXV
9:30 PM	1296.100 MHz	WA3NUF
10:00 PM	903.100 MHz	N3AOG

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LADIES' NIGHT: N3AOG 215-443-9965
JUNE CONTEST: WA3AXV 215-355-5730
HAMARAMA: WB3JYO 609-538-1687
VHF CONFERENCE: KB3XG 610-584-2489

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n3efn@arrl.org

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Attorney at Law

2217 PALOMINO DRIVE
WARRINGTON, PA 18976

TEL: (215) 343-6902
FAX: (215) 343-6903

Calendar of Coming Events - July 1997

- July
4 **Independence Day**
- 10 **Packrat Board of Directors meeting** will be held at the QTH of Joe, AA3GN, at 8:00 PM. All interested parties welcome. Call 215-855-6056 for directions.
- 12-13 **CQ Worldwide VHF QPX Contest.** See May CQ Magazine for rules or July QST, pg. 97. Contest runs from 1800 UTC, 12 July to 2100 UTC on 13 July (27 hours). All bands from 50 MHz up.
- 13 **Mid-Atlantic ARC Hamfest 96** will be held at the Kimberton Fire Co. Fairgrounds (near Phoenixville, Pa.) . Talk-In on 146.66/06 and .52.
- 17 July meeting of the Packrats will be the **Annual White Elephants Sale** at Gary's Glen (WA2OMY's QTH) on Mt. Kirk Road in Baglerville, Pa. Starts promptly at 8:00 PM. Bring Chairs. For directions call 215-539-6409. See the enclosed map.
- 24 **LEAP INTO THE MICROWAVES with the Packrats!** 903 and above. Starting on the 4th Thursday of the month and continuing 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.
- 24-26 The 31th Annual **Central States VHF Conference** will be held in Hot Springs, Arkansas at the Clarion Resort on the Lake. For further information, contact Joel Harrison, W5ZN, at 501-729-3301 or via e-mail at w5zn@arrl.org.
- 27 **Maryland Hamfest, Timonium, Md.** at the Maryland State Fairgrounds, located on York Rd. adjacent to I-83 near I-695 Talk-in on 147.63/03, 146.16/76, and 146.52. VE sessions.

Health and Welfare

Marsha Lissauer, WA3TEM, daughter of the late Harry, W3CL, became a silent key in early June.

Al, K3EOD, has a new walking cast. Hope he can make it to the White Elephant Sale with or without it.

June Contest Report

By Ron, WA3AXV

Another June contest is in the books. A fine turnout by members and a few non-members helped make this contest one of the best manned in recent memory. There were a few glitches, but as a whole the weekend went very well. The food, as usual was excellent! We even had the kitchen sink this year. Thanks to N3OZO and N3ITT.

The score was very good, but not quite up to last years. We basically live or die with 6 meter openings. Six was open for quite a while so the contact count was good, but the grid count was down because it was always open to the same areas. Two meters turned in an impressive performance, with several new ops thrown into the fray, the score was almost identical to last years. 220 and 432 held their own and the microwaves did very good. John, KB3XG, our "Lone Rover" visited four grids with microwave equipment. FN30 was a new stop on the tour because there is now one on above 1296 in FN30! For shame.

I was really impressed with the "real" rovers that we worked on the bands. There were a lot of really good roving stations that worked lots of different stations from many grids. Now that we have solved the problem of grid circling and have achieved an equitable rover scoring system, maybe it time to get back to the real "rover problem" of captured rovers generating manufactured contacts.

Thanks to all the folks that helped on the hill and all the members who worked the club on as many bands as possible. On the hill were: WA3AXV, W2SK, N3EUV, N3EXA, W3GAD, AA3GN, N3ITT, WB3JYO, W3KM, K3MFI, N3NGE, WA3NUF, N3OZO, WA3RLT, W2SJ, WA1YHO, WA3YUE, WU3C and K2UT. Visitors were: WB3KRW, N3DQZ, N3AOG, KB3XG and W3ITT.

ELECTION RESULTS: CLUB OFFICERS 1997-1998

President: Ron, WA3AXV

Vice President: Jim, WA3EHD

Treasurer: Dave, W3KM

Recording Secretary: Walt, WA3AQA.

Corresponding Secretary: Dick, N3AOG

Directors: Bob, W2SJ, Joe, AA3GN, Al, N3ITT and Brian, N3EXA

Note: Page 2 of Cheesbits will be updated next month

MID ATLANTIC VHF CONFERENCE - CALL FOR PAPERS

The Mid Atlantic States VHF Conference will again be held at the Horsham Days Inn in Horsham, Pa., just north of Philadelphia. This years conference will be held on Saturday, October 4, 1997. Sponsored by the Mt. Airy VHF Radio Club, the conference continues to present a wide variety of technical papers covering all aspects of 50 MHz through light frequencies. Talks on operating, propagation, construction and theory are among those requested. Speakers are encouraged to contact the conference chairman early. The day after the conference, the largest hamfest in the area, Hamarama 96, also sponsored by the Mt. Airy VHF Radio Club will be held.

Contact: John Sorter, KB3XG, Conference Chairman
1214 N. Trooper Road
Norristown, PA 19403
610-999-7658
JohnKB3XG@aol.com

TID BITS

As an experiment Del KD1DU and WZ1V have put some of the North East Weak Signal Groups' newsletters online: <http://www.qsl.net/vhfnews/newsletr.html>.

The July 1997 issue of Cheesbits has a note by Zack, W1VT, on a High Performance 10 Ghz Band Pass Filter. It has two tunable cavities and is built using a 1.5 inch section of WR-90 waveguide. Input and output are sma connectors. Measured insertion loss is 0.6 dB, 3 dB bandwidth of 106 Mhz and 144 Mhz image down 33 dB. Tuning was done using a mixer and external signal generator. Artwork and parts list for the mixer are included as well as tuning instructions. A feedback item on Zach's sequencer appearing in the Oct. 1996 issue is also in this issue.

The June/July 1997 issue of the NTMS Newsletter, Feedpoint, contains a note by John, WD4MUO/4 on tuning the OE9PMJ 24 Ghz filters and how to grind 10 GHz DRO's to higher frequencies.

New member, John Kedziora, WU3C, has rejoined to Packrats after finishing school. John was at the mountain operating in the July contest.

Swap Shop:

For Sale: Kenwood TS830S, \$500, Johnson Matchbox, \$100, Drake R4 Receiver, \$100. Contact Herb, K2LNS at 717-472-2230.

CHEESEBITS SUBSCRIPTIONS

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July 1997

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GETTING STARTED ON 24 GHz

de KB3XG

INTRODUCTION:

I know what you're thinking "Oh no, not another new band!" Over the past few years 10 GHz transverters have become commonplace. I'm not saying that there is a QRM problem on 10 gigs but the increased activity generally indicates that it's time to move up an octave or so in frequency and start the experimentation cycle at 24,192 MHz. Over the next few months Paul, WB3JYO, and I will document the results of our efforts to design a serious narrowband 24 GHz transverter.

WHAT TO LOOK FOR:

At work, your employer expects you to complete a paper design, order parts, then build and test your RF widget. A ham radio design does not follow the same process. The first step is to start collecting parts. The design, build, and test phase of the project happens concurrently and evolves around whatever parts you have managed to collect.

CONNECTORS:

The 3.5 mm connectors used for this band are different in appearance from standard SMA connectors. This makes it a little easier to spot something good in the bottom of a hamfest junkbox. The barrel of the 3.5 mm looks the same as a SMA but if you look at the center pin you will see that there is no teflon holding the center conductor in place. Closer inspection shows a small piece of black webbed plastic keeping the pin centered. This type of connector is good up to 33 GHz.

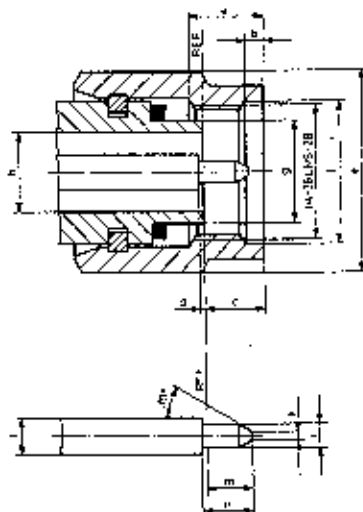
3.5mm CAUTION:

If you should happen to find some components with 3.5 mm connectors at a hamfest, make sure you treat them with TLC. Paul has warned me that you CAN NOT put a male SMA into a female 3.5 mm. Even though the connectors seem to go together without a problem, the length of the SMA center pin is not held to tight tolerances. If the center pin of the SMA is too long it will deform the shape of the black plastic web holding the 3.5 mm female pin in place. It is possible to replace the plastic web in some types of 3.5 mm connectors, but chances are good that you have just ruined a very expensive connector.

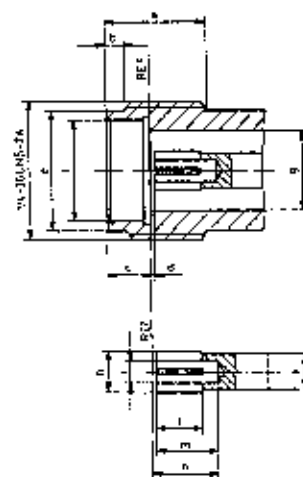
A connector interface trick that Paul uses at work is to connect a 3.5 mm male barrel to a SMA female barrel. You CAN put a 3.5 mm male into a SMA female without damaging either connector. Because of the lack of 3.5 mm adapters, I had to establish another trick. I used a caliper to measure the length of the SMA pin on each cable and adapter before tightening the connectors together. The sentence should read: The male SMA pin should not extend beyond the teflon by more than 0.091". Sometimes the teflon walks out of the jacket and extends the reference plane of the center pin. The tip of the SMA pin should be 0.035" down from the edge of the threaded coupling barrel. (See 3.5 mm connector diagram.)

Interface Dimensions

Plug



Jack



Interface Dimensions in inches

	Plug		Jack	
	min.	max.	min.	max.
a	.130	.138	.173	.181
b	.028	.035	.028	.035
c	.098	.122	.074	.078
d	.000	.003	.000	.003
e	of .309	of .315	.209	.213
f	.252	.260	.181	.182*

g	.179	.180	.1378	.1383*
h	.1378	.1383*	.061	.062
i	.036*	.037	.037	.038
k	.008	.014	.059*	.060
l	.059*	.060	.079	.087
m	.078	.091	.110	.126
n	.081	.091	.110	.129

* After gold plating the dimensions are in conformity with the IEC draft.

WR-42 WAVEGUIDE:

WR-42 waveguide plumbing is also another way of quickly identifying the operating frequency of a mystery circuit. It's a good idea to put a 6" scale in your back pocket to be sure you looking at the correct size waveguide.

ELA WG	Range GHz	Cutoff GHz	Loss/100 ft.	Inside Dimension	Outside Dimension	Flange Dimension
WR42	18.0-26.5	14.05	20.7	0.420-0.170	1/2" x 1/4"	7/8" x 7/8"

There are a few other oddball flanges to look for. One is a 1 1/8" circular flange with four 4-40 mounting holes. The other is a mini rectangular flange 3/4" x 3/4" square. With care, both of these flanges can re-tapped and interfaced to the standard 7/8" flange.

WHAT I HAVE FOUND:

I was lucky to find my first load of goodies from a single source. I purchased a pair of Digital Microwave Corp. 18" dishes with scalar horn feeds for \$300 from Jeffery Winemiller. Jeff usually shows up at the Maryland hamfests. Built into the back of each dish are 2 identical (redundant) transceivers. Each transceiver had a DRO, mixer, circulator, IF amp, and a linear PA. Each unit is designed to

operate full duplex. All components are connectorized with SMA's. Paul, WB3JYO says that standard SMA's will work at 24 GHz but there is a rapid VSWR deterioration above 18 GHz. There are SMA that are rated above 18 GHz but it is unlikely that you have a selection of these connectors in your junk box at home. Paul and I have found a way to make SMA connectors work and will discuss this as well as how to identify high frequency SMA's at a later date.

I received a lot of information on the DMC units from the RSGB Microwave Newsletter. It seems that 24 GHz surplus is a little more plentiful in England. Peter Day, G3PHO has put several of the DMC units on the air. The units do not look like a typical dish. It is an all white fiberglass construction with a conical radome. It looks like a short white bullet two feet in diameter. The dish surface and feed is not visible since the radome is RTV'ed to the fiberglass structure. I asked to cut through the RTV before I purchased the units.

Digital Microwave Corp.
23 GHz 18" Antenna
P/N 086423218
DMC Transceiver boxes
P/N DMC-110001

Transmit frequency 22.2 GHz or 23.4 GHz
Receive frequency 23.4 GHz or 22.2 GHz
Transmit Pout = +15 dBm

MISCELLANEOUS:

Jeff Winemiller also has many of the smaller gunplexer transceivers with 8" dishes. These units look like traffic light assemblies. Each unit contains 2 dishes, 2 feeds, and 2 gunplexers. The dishes are very deep (low f/d) and use a dipole reflector feed. This type of feed has a broad beamwidth. The gunplexer is interfaced to the feed through a WR-42 flange. Dick, WA2AAU has a few of these FM units on the air.

I bought a HP 33313C coax switch at Dayton last year for \$80. This relay is good up to 26.5 GHz and looks just like other HP relays except it has 3.5 mm connectors. Jeff Kruth from Maryland has short pieces of WR-42 waveguide for \$10 each. Paul bought a pair of Ma/Com FM boxes last year at the Pack Rat hamfest for \$100. These weatherproof steel boxes are 14" high x 12" wide x 6" deep. The units contained some WR-42 elbows, filters, a circulator, four WR-42 50 Ohm loads, and a WR-42 transfer relay. (Good item!) Ma/Com Model # 842901-1, Transmit frequency = 22.375 GHz.

I have collected a small assortment of unidentifiable aluminum, brass, and copper WR-42 waveguide plumbing. So far I have not found much use for any of it. I plan to experiment with building homebrew waveguide transitions and will probably use some of this junk for that purpose. Homebrewing transitions is very important since they have a \$100 to \$200 price tag even at hamfests.

CONCLUSION:

Getting on this new band has not been a trivial task but I have enjoyed the excitement of working at a new frequency. Keep your eyes open at the next hamfest you attend. Maybe there is some WR-42 junk in your basement that you thought you would never use. Please put out a message if you hear of any good surplus finds. Next month I will talk about our first attempt at a narrowband transverter using the surplus parts that Paul and I have collected.

CONTACTS:

Peter Day, G3PHO
RSGB Microwave Newsletter
146 Springvale Road
Sheffield S6 3Nu.
England
160337.3000@compuserve.com

Jeffrey Kruth
Kruth Microwave
4862 Montgomery Rd.
Ellicott City, MD 21043

Jeffery Winemiller, Winemiller Communications, RR1 Box 702G, Landisburg, PA 17040

OTHER REFERENCE ARTICLES:

Michael Kuhne, DB6NT
200 mW GaAsFET Amplifier for 24 GHz
VHF Communications 3/1995
clearlight.com/~vhfcomm/db6nt.htm

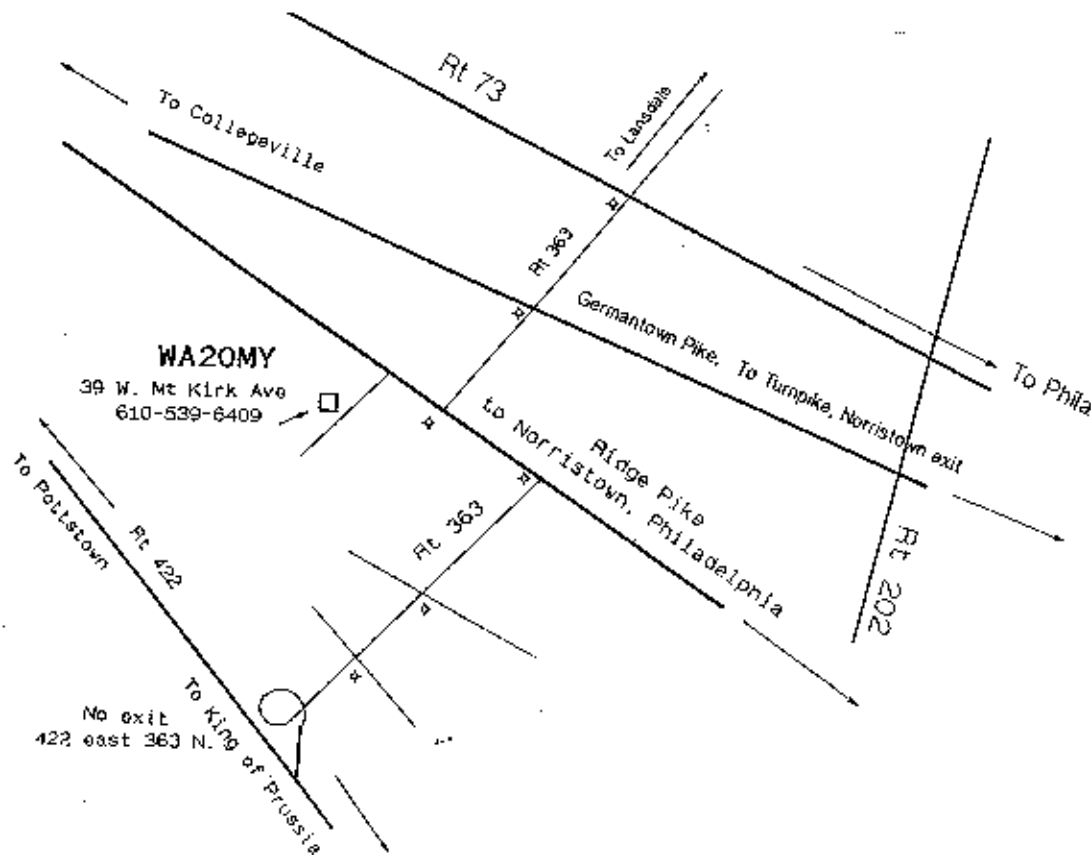
52 Miles on 24 Ghz
4/85 Presentation by WA2AAU

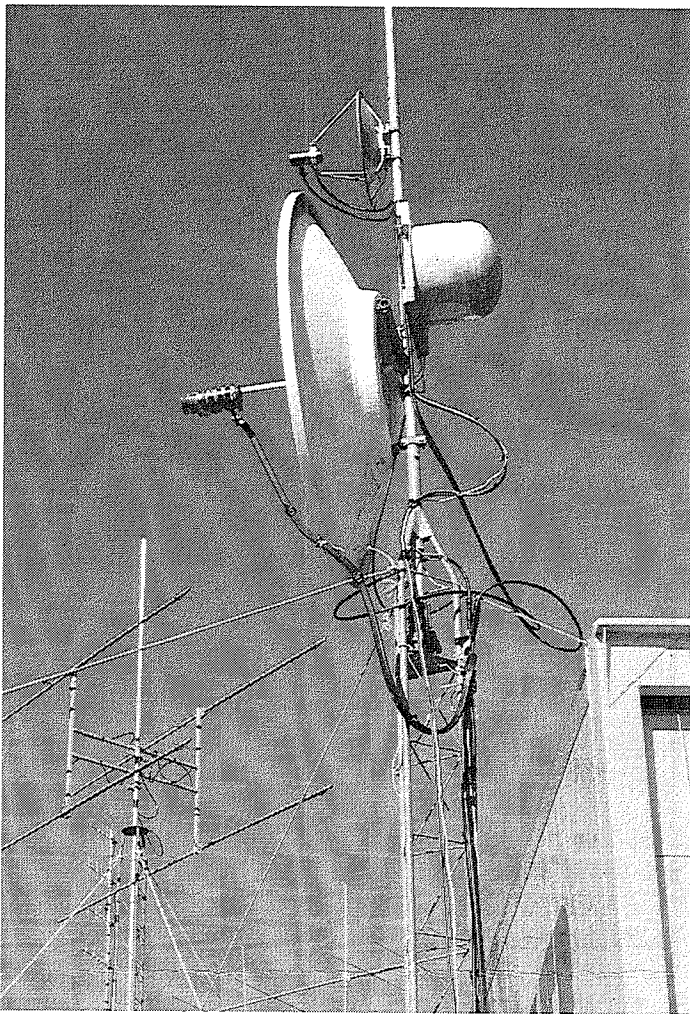
24 GHz Comes to Appliance Operators
Feed Point, Feb/Mar 1997, Vol. 11 Issue 1
makiugf@alpha-web.or.jp

Simple 24 GHz Transverter
Al Ward, WBSLUA, 1-8-93

24 GHz Waveguide Filter
Kent Britain, WA5VJB

MAP to July WHITE ELEPHANT SALE (Gary's Gulch)

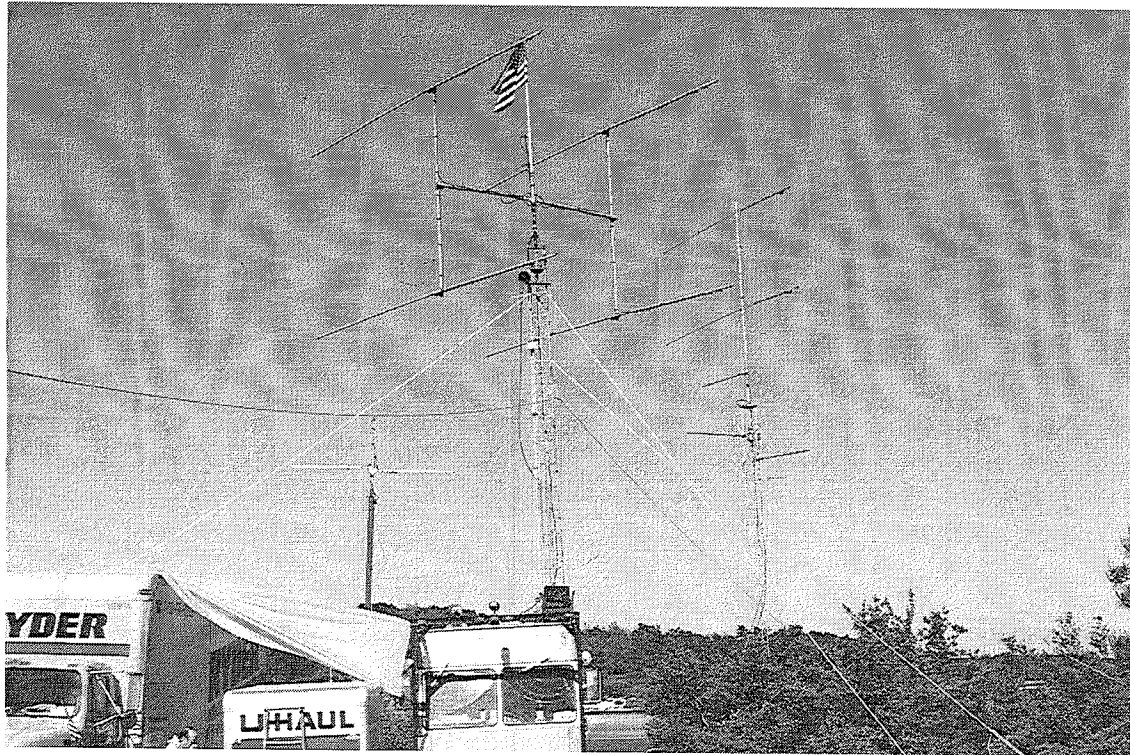




Microwave Tower with small dish with 3.3 and 5.7 GHz feeds
6 ft. 10 GHz dish, and 24 GHz "Bullett" dish/Transverter

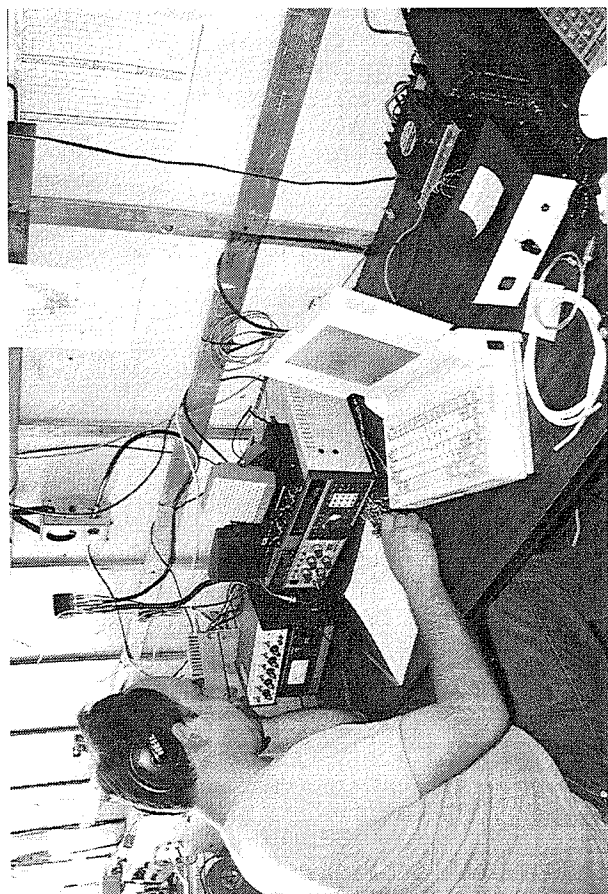


Stacked 6 Meter Yagis with two small 6M fixed yagis

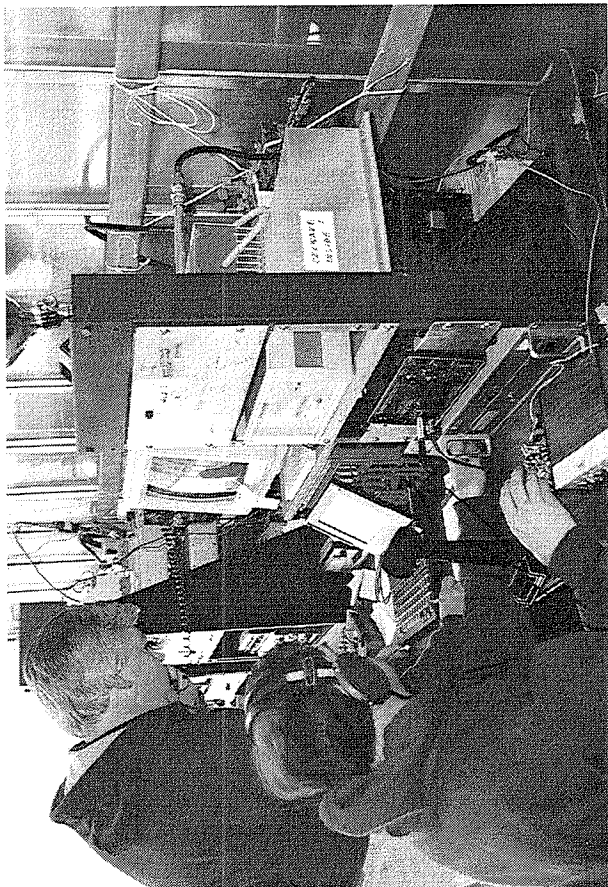


Quad of Yagis on 144 MHz Tower and 222 MZz Yagi Tower

W3CCX/FN21 JUNE 1997 VHF CONTEST ON CAMELBACK MOUNTAIN



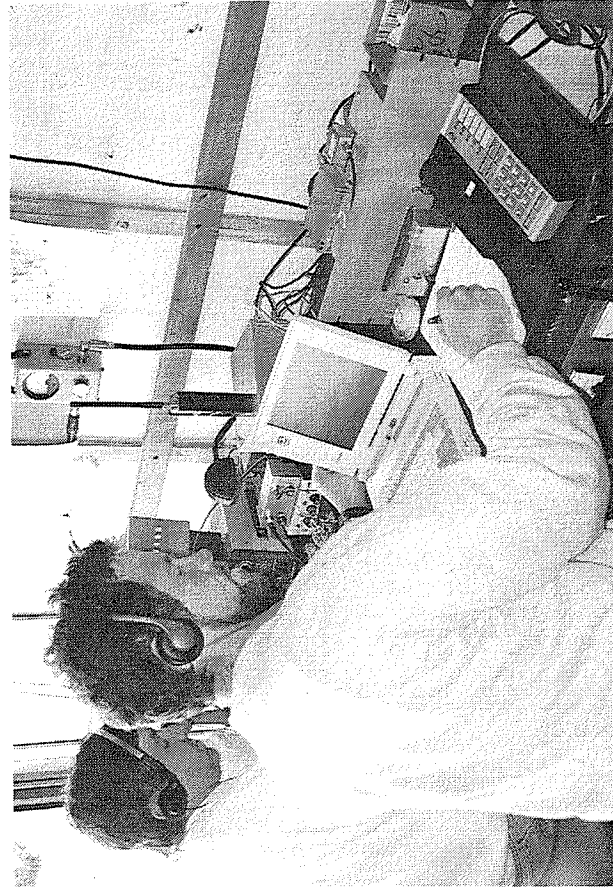
Len, N3NGE at the 222 MHz Station



Phil, WA3NUF and Ben, WA3RLT in the Microwave Shack



Joe, AA3GN Operating 6 Meters



BOB, K2UT and Paul, WA3JO operating 144 MHz

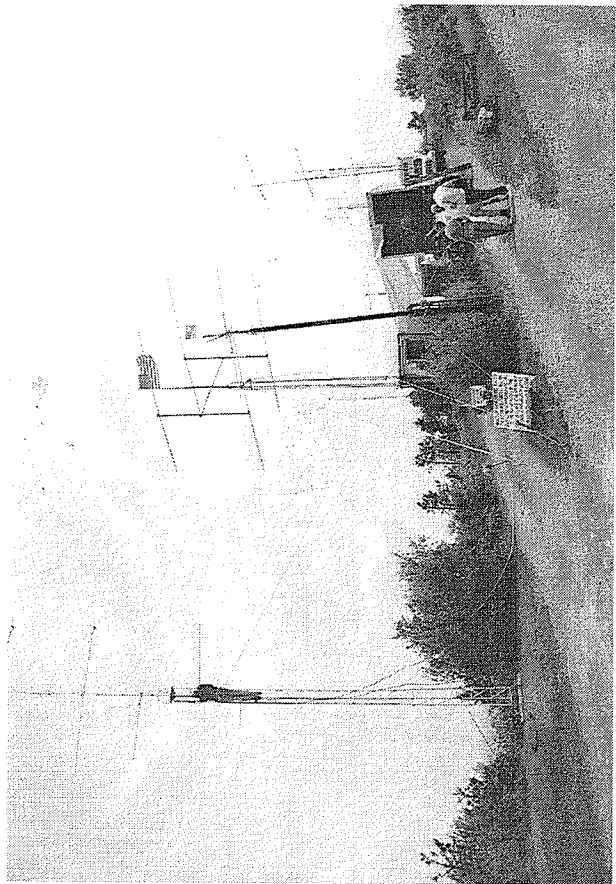
W3CCX/FN21 JUNE 1997 VHF CONTEST on CAMELBACK MOUNTAIN



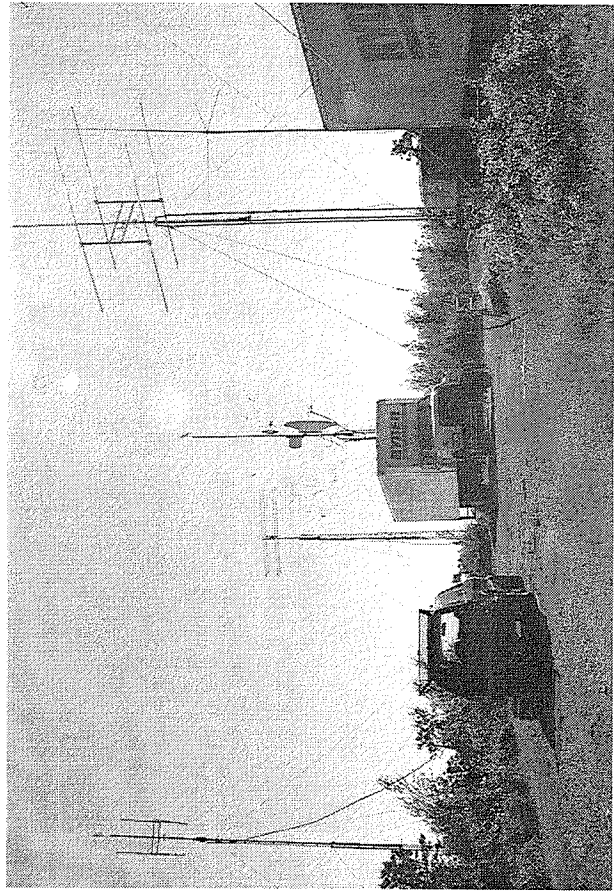
Dave, W3KM, and Phil, WA3NUF in the Microwave Shack



Pat, W2SK, Operating 432 MHz



Stacked Horiz. 222 & 4 222 Vert./ Quad of 144 & 4 Vert. / Stacked 6 Meter Yagis



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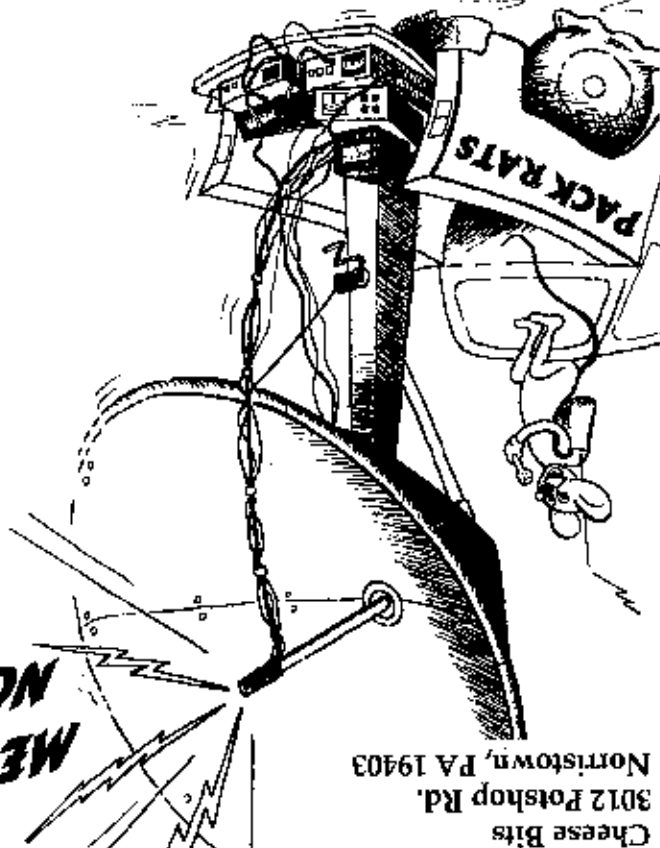
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12/97



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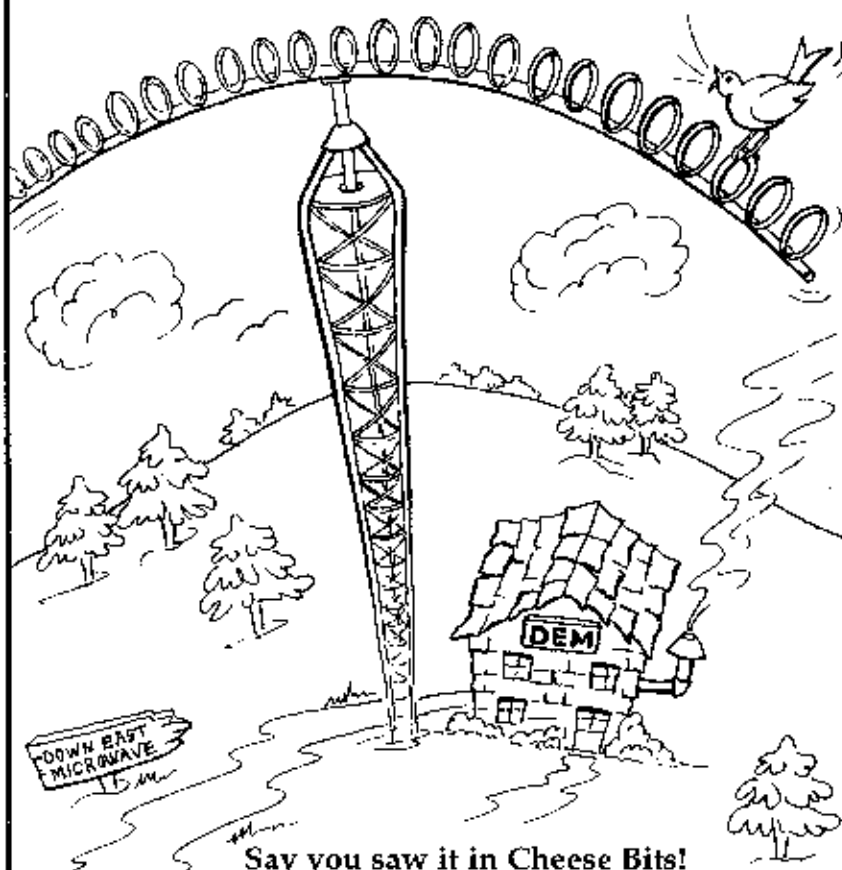
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