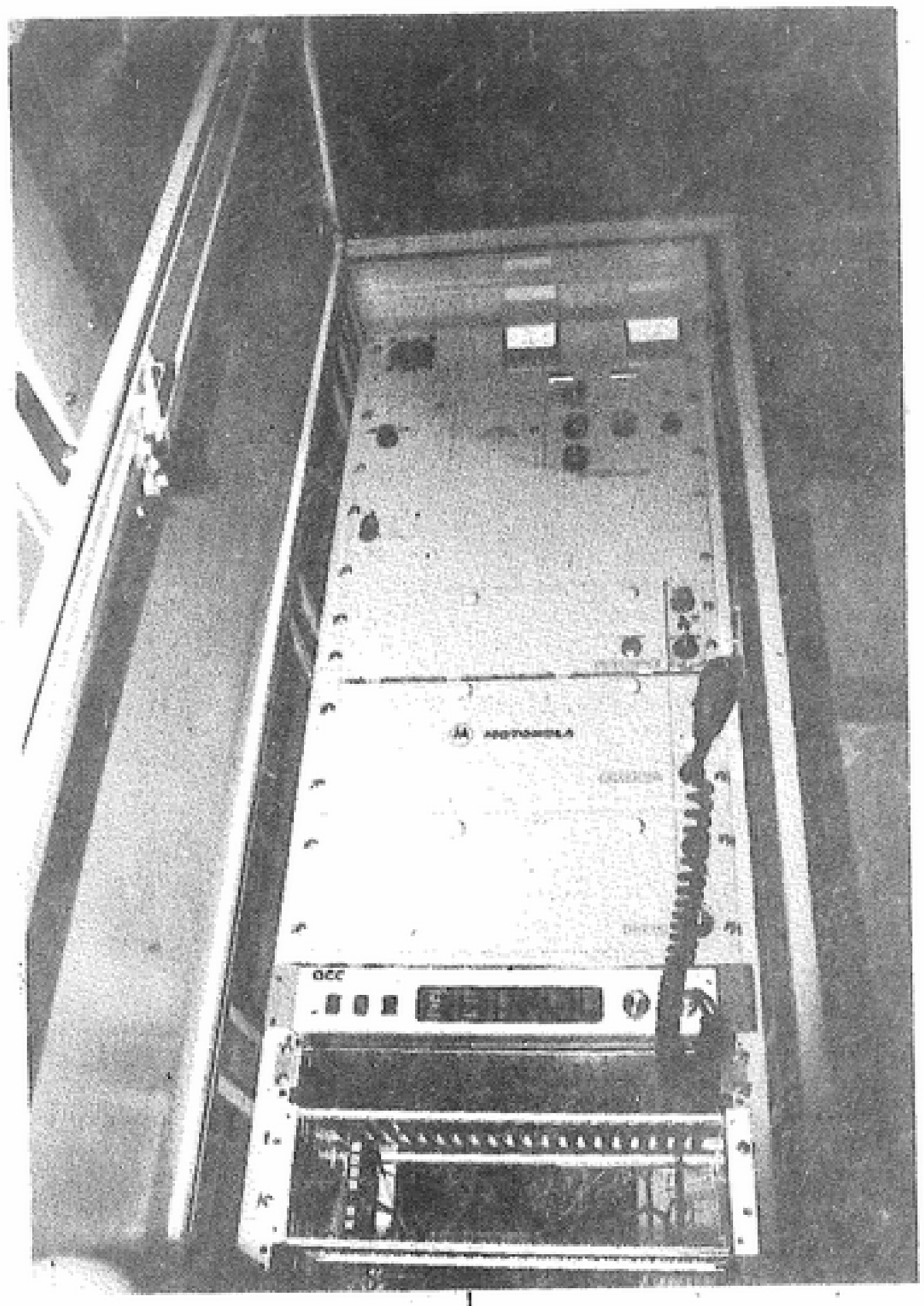
CENTRAL OKLAHOMA RADIO AMATEURS
COLLECTOR AND EMITTER

50¢

Volume 9 JANUARY 1984 Number 108

*** I N D E X ***



THE BIG KAHUNA IS UNCOVERED INSIDE!!
COLLECTOR AND EMITTER EXCLUSIVE
AS NOTORIOUS NORMAN N5MS REPEATER
TELLS ALL AND BARES ALL! 146.28/88
MHZ ON YOUR RADIO DIAL.

NO-CODE BURIED

"Basically I feel the item is a report on the health of the Amateur Radio Service. The Amateur Radio Service is well, it's thriving, and it's providing an excellent service to the American public." With these words Private Radio Bureau Chief Robert Foosaner introduced the staff recommendation to the FCC Commissioners that the "No-Code" proposal (Docket 83-28) be dismissed "for keeps." Almost 5000 comments were filed, running 20 to 1 against removing the code requirement.

Foosaner said that in reaching the decision, the Private Radio Bureau considered three questions: (1) Is the Amateur Radio Service growing? (2) Is the code an unnecessary barrier to young computer-oriented individuals? (3) Is the slow-speed code requirement discriminatory against handicapped individuals? Question one was answered by statistics showing that in 1930 there were 30,000 licensees; in 1975, 300,000 and in 1983 well over 400,000. On the second point, Foosaner noted that although the code test is something one must prepare for, it requires a minimal amount of study to pass the slow-speed exam. Finally, Foosaner read a portion of the comments filed by Handi-Hams, which reported that they had trained over 5,000 severely handicapped individuals in the skills needed to pass Amateur Radio examinations. For some of these individuals, Morse Code is the only mode that they are capable of using!

"In conclusion," the bureau chief said, "I strongly recommend that we maintain the code requirement, we endorse the Service as it is, and we bury the concept of 'no-code.'" Ten months ago few hams would have expected this statement to come from the FCC staff. But that is what the staff recommended, and a few minutes later the FCC Commissioners voted unanimously to keep the Morse Code requirement for all classes of ham licenses in the United States.

Chairman Mark Fowler made these concluding statements:

" . . . I think this is the right decision; we can put it to rest once and for all and I agree with the item . . . Radio amateurs have contributed vitally to our country just recently; they were stalwart in their services in performing communications with Grenada . . . The Code sometimes is very important, indeed even critical for getting the messages through . . . "

ARRL President Carl Smith, WØBWJ, sent this "thank you for no no-code" telegram to FCC Chairman Mark Fowler on December 15:

"Your remarks yesterday morning at the FCC Open Meeting, regarding the usefulness of the Morse code and the contributions of radio amateurs to the country, are deeply appreciated by the Amateur Radio community. Please accept our congratulations and thanks for the way in which you, the other Commissioners, and your staff have handled this important item. In putting the no-code issue to rest once and for all, you have demonstrated a commendable responsiveness to the people you are appointed to serve and have given the radio amateurs of the United States a fine Christmas present."

A R R L NEWSLETTER

THESE CORA MEMBER CLUBS PROMOTE AMATEUR RADIO

1 AERONAUTICAL CENTER ARC
MEETS: 8:00pm First Friday. Flight Standards Bldg., FAA, S. Macarthur

PR	K5LDI	Tom Mangham	677-5291
VP	AF5X	Jess McKenzie	329-1543
SE	KA5JCX	John Mooney	794-8519
TR	K5RJR	Larry Vorheis	789-9629
EDITOR: John Mooney, KA5JCX			794-8519

2 OKLAHOMA CENTRAL VHF CLUB
MEETS: 10:00am Third Saturday. Red Cross. 10th & Hudson(Back door) Okla City.

PR	WA5HTL	Paul Asplin	787-4286
VP	KD5IS	Jerry Wetmore	524-5080
SE	K5JB	Joe Buswell	732-0676
TR	W5KE	Ellard Foster	789-6702
EDITOR: Joe Buswell, K5JB			732-0676

3 MID-OKLAHOMA REPEATOR, Inc.
MEETS: 8:00pm First Tuesday. Okla City EOC. 4600 N Eastern

PR	N5EPV	Bob Allen	Unlisted
VP	KD5DL	Holly Stewart	
SE	KA5CIW	Fred Taylor	528-1537
TR	W5KOZ	Sid Gerber	737-1050
EDITOR: Susie Atkinson, KA5FED			842-8014

4 OKLAHOMA CITY AUTOPATCH ASSOCIATION
MEETS: 7:30pm Third Tuesday. Okla City Fire Training Center. 800 N Portland

PR	WD5FKF	Reuben Castleberry	691-1070
VP	WB5NDO	Kathy Whited	799-1457
SE	N5DLM	Vicki Adkins	722-6195
TR	KE5M	Ron Recer	341-7030
EDITOR: Kathy Whited WB5NDO			799-1457

5 OKLAHOMA UNIVERSITY AMATEUR RADIO CLUB
MEETS: 7:30pm Second Tuesday (Sep-May) 119 Wilson Center. 1334 S Jenkins

PR	KA5BAY	Luke Noah	325-1775
VP	KE5N	John Wustenberg	325-2382
SE	KA5COI	Peter Richeson	329-3217
TR	KA5LZN	Greg Smith	366-1641
EDITOR: Greg Smith, KA5LZN			366-1641

6 ALTUS AREA AMATEUR RADIO ASSOCIATION
MEETS: 7:30pm Second Thursday
North Main Fire Station (CD) Altus

PR	KA5MPK	Gary Alexander	482-0857
VP			
S/T	KA6RTX	Bill Flattery	482-1155
EDITOR: Bill Flattery, KA6RTX			482-1155

7 BICENTENNIAL (76ers) ARC
MEETS: 7:00pm Second Tuesday. OG&E Bldg. SE 3rd & E. K. Gaylord Blvd.

PR	N5BFD	Jim Hopkins	947-0043
VP	WD5JNT	Ted Vanlaningham	262-1675
SE	N5AUH	Jerry Sproul	354-2061
TR	WA9AFM	Tom Webb	737-6716
EDITOR: Bruce Goff, KC5CR			751-7192

9 WHEATSTRAW AMATEUR RADIO CLUB
MEETS: 2:30pm Second Sunday. Location varies. See club section.

PR	KA5FUU	Tom Johnson(El Reno)	262-5631
VP	KA5DUO	Leo Peil (Canton)	886-2996
S/T	WA5PFK	Ralph Wilder(Watonga)	623-4521
EDITOR: George Maschino, K5GGL			263-7614

12 SHAWNEE AMATEUR RADIO CLUB
MEETS: 8:00pm Second & Fourth Tuesday
Shawnee City Hall (EOC)

PR	KD5NX	Jay Tingler	273-3033
VP	N5CGZ	David Stanley	273-4226
S/T	W5TQZ	Herbert Holton	598-5934
EDITOR: Earl Couch, WB5ZBA			589-3212

13 KAY COUNTY AMATEUR RADIO CLUB
MEETS: 7:00pm Third Thursday
Ponca City EOC

PR	WB5YRN	Delbert Foiles	762-4479
VP	WA5UBO	Marsh Pronneke	363-2526
S/T	KA5PUB	Glenn Bishop, Jr.	
EDITOR: Rick Long, WD4CEP			767-1871

14 CIMMARON AMATEUR RADIO ASSOCIATION
MEETS: 7:00pm Second and Fourth Mondays. Place varies. See club section.

PR	WB5ECM	Dennis Painton	764-3599
VP	N5FUP	Steve Schoonmaker	886-3274
SE	N5FMH	Nadine Painton	764-3599
TR	N5FUR	Ruth Simpson	227-2791
EDITOR: Major Bailey, KI5P			227-2061

15 SOUTH CANADIAN AMATEUR RADIO SOCIETY
MEETS: 9:30am Second Saturday. Red Cross Bldg., North OU Campus. Norman

PR	KA5MIZ	Bob Rabin	360-6996
VP	KA5EFJ	Ken Neptune	321-7789
SE	WD5GTC	Gene Johnson	321-6759
TR	N5BEW	Ken Esadoah	329-4667
EDITOR: Sam Barrett, WA5RPP			321-2601

16 EDMOND AMATEUR RADIO CLUB
MEETS: 7:00pm First Thursday. See club section for location and type.

PR	WD5DYI	Mark Northcutt	755-4672
VP	WB5MLX	Glen Cochran	942-7148
S/T	WB5UIY	Stan Van Nort	Unlisted
EDITOR: Stan Van Nort, WB5UIY			

18 GREAT PLAINS AMATEUR RADIO CLUB
MEETS: 7:30pm First Tuesday
Civil Defense room, Woodward courthouse.

PR	WA5PLW	Windle Hatchett	766-3561
VP	W5KEK	Lewis Patterson	
SE	K5YZK	Jim Phares	254-2319
TR	KA5SDE	James Rockhold	
EDITOR: Jim Phares, K5YZK			

10 EDMOND AMATEUR RADIO SOCIETY
MEETS: Varies. See club section

PR	N5DBM	Ken Stepp	341-4874
VP	KA5MJT	Mike Smith	373-1120
S/T	KB5RR	Clarence Dollmeyer	341-7163
R TRUSTEE		Bill Wright, KC5GN	341-6076
EDITOR: John Keeling, WA5ZGM			340-1253

20 ARDMORE AMATEUR RADIO CLUB
MEETS: 8:00pm First Wed. Red Cross Bldg. Informal, 8:00pm other Weds. 221 9th NW

PR	WB5VBK	Fred Innis	223-1709
VP	WD5FZD	John W Merlyn	223-9543
SE	W5JCX	Jim Chilcoat	226-6816
TR	W5BLW	Charles Dibrell	226-0589
EDITOR: Glen Hamilton KE5ES			226-4379

CENTRAL OKLAHOMA RADIO AMATEURS, Inc.
MEETS: 7:30pm Fourth Tuesday. OKC Fire Training Center. 800 N Portland

PR	WN5NWX	Reggy Whited	799-1457
VP	K2GKK	D. C. Macdnald	672-4947
SE	N5BEQ	Jim Buswell	236-0368
TR	WD0FTM	Linda Callison	751-3620

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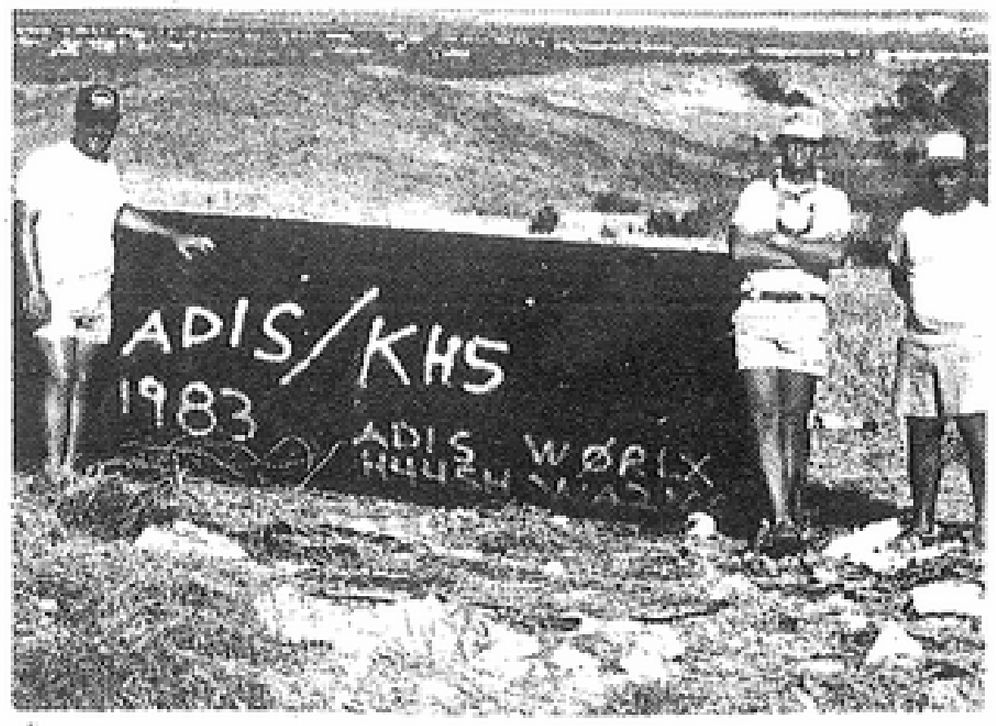
Joe Harding, WA5ZNF, 737-1044

CIRCULATION MANAGER:
Bob Graham, WB5NSV, 677-8685

WHERE THE HELL IS JARVIS ISLAND ANYWAY???



Weary Operators of AD1S/KH5 pose before graffiti on old fuel drum just prior to departure. Left/right are: Stu, WA2MOE; George, AD1S; Burt, WØRLX and Stuart, H44SH.

The expedition team flew from Honolulu to Christmas Island on November 3, 1983 as planned, to meet our chartered sailboat and depart right away to Jarvis Island. As we circled Christmas Island in our Air Tungaru Boeing 727, we knew we had a problem, for nowhere on the horizon could we see a sailing vessel of any type!

We contacted a group of friendly hams, including T32AN and T32AO and learned that the 38 foot sailboat "Farouche" was stranded in the doldrums just a few miles north of Christmas, and was to attempt to motor in with the Diesel auxillary engine.

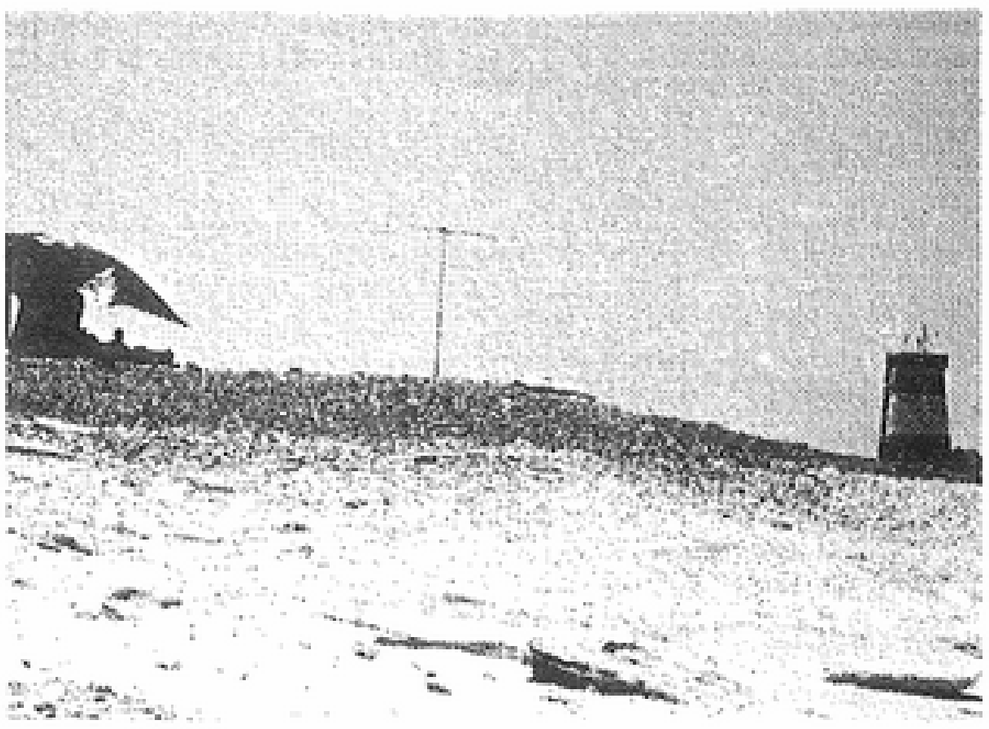
We were stranded on Christmas Island, with our transportation becalmed at least 12 hours away. Our concern and disappointment was softened by the hospitality of our Kiribati ham friends and especially John Bryden, owner of J.M.B. Rentals who provided land transportation and alot of personal support.

We spent the night of November 3, 1983 at the home of an American chap who operates the island store on Christmas. We set up T32AS in his home, using a dipole to make several hundred QSO's, mostly on 40 and 80 meters. Again we contacted Derek Jarvis, master of Farouche who assured us he would land the following morning!

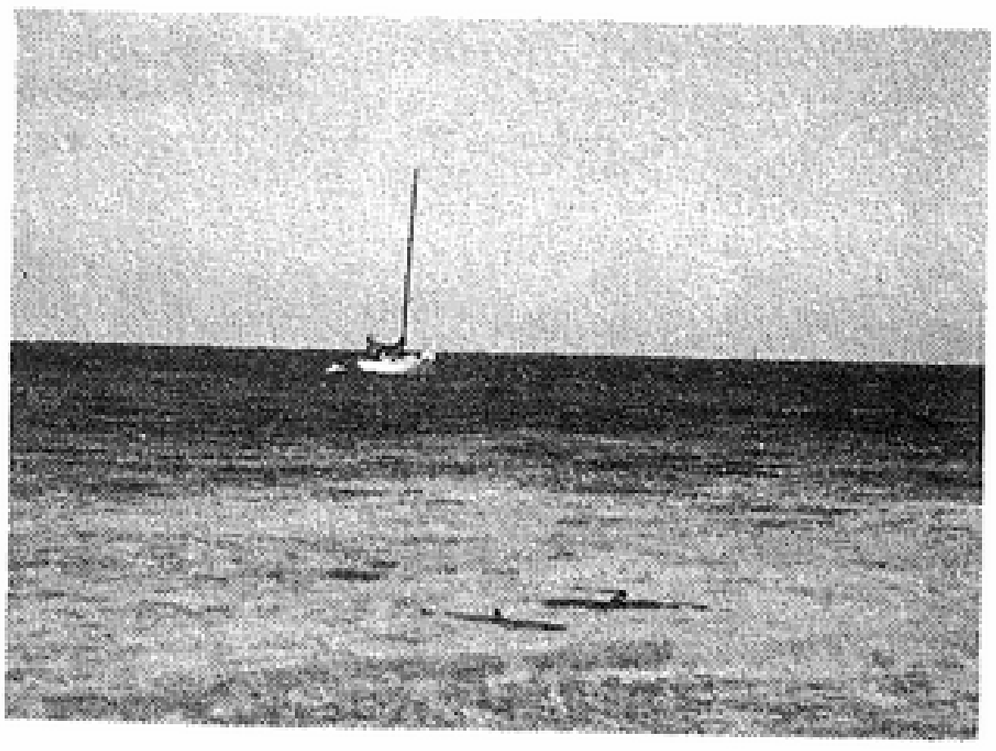
It was a relief to stand on the beach the next morning and see the beautiful white sails of Farouche as she broke above the horizon. Within hours, we would be loaded and under sail again, heading for Jarvis Island National Wildlife Refuge and the goal of our expedition.

The south-east trade winds smiled on us permitting an excellent sail to Jarvis, and within forty-three hours we dropped anchor just a few yards from the surf crashing across the narrow reef to the leeward side of the island.

We raced to off-load all the supplies necessary to get the first stations on the air before darkness. All gear, generators, gasoline, food and water was ferried ashore in the Farouche's small Zodiac dinghy, and within four hours the first QSO was made from AD1S/KH5.



Two photos taken from the boat landing on Jarvis Island. Above; Tarpulins comprised shelter for both operating positions, with two transceivers under each shelter. Below; The 38 foot sloop "Farouche" at anchor in 400 feet of water just yards from the reef. Note the fins of ever present reef shark just a few feet from the beach.



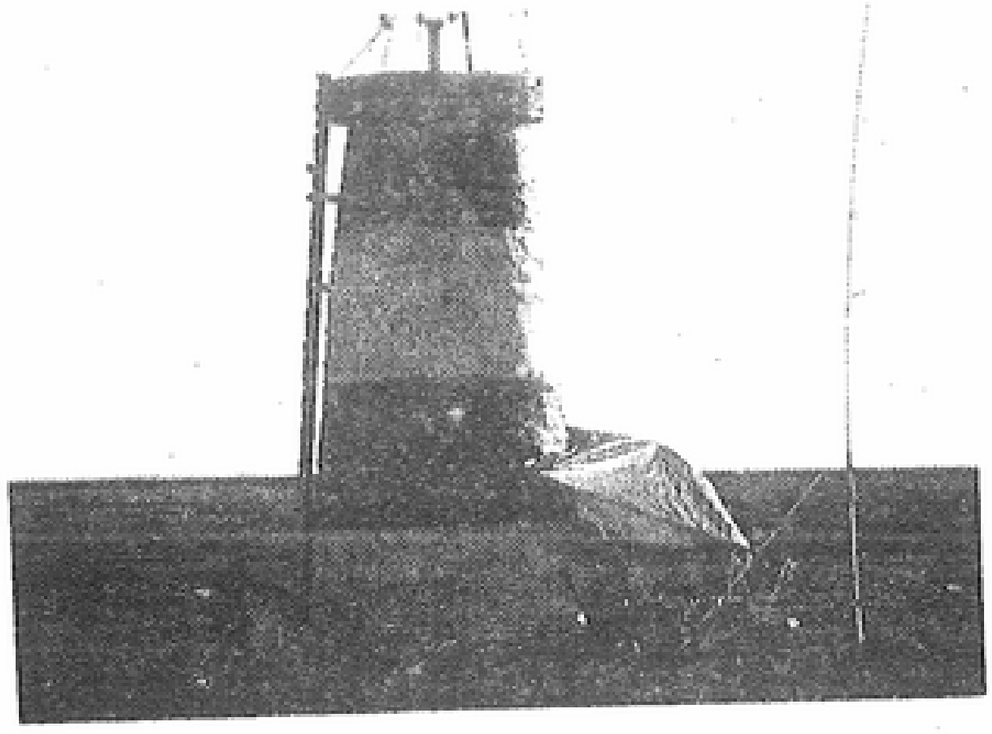
The stations were assembled on the "cliff" of coral above the man-made boat landing. This was the highest point on the island plus adjoined the only remaining structures on Jarvis, the abandoned lighthouse and the Wildlife Refuge No Trespassing sign.

Tables were rigged from old boards and rusty fuel drums which were all that remained of the old settlement dwellings following a 1957 tidal wave.

AD1S opened the operation with the obligatory (3) "CQ's" and immediately worked JG1JWP at Ø542 UTC on November 7, 1983. Operation was then continuous and around-the-clock until we closed with KC4TJ at 235Ø UTC on November 10, 1983. Between those hours, we managed to make over 16,000 QSO's from Jarvis Island, including the first ever on 3Ø meters and 16Ø meters.

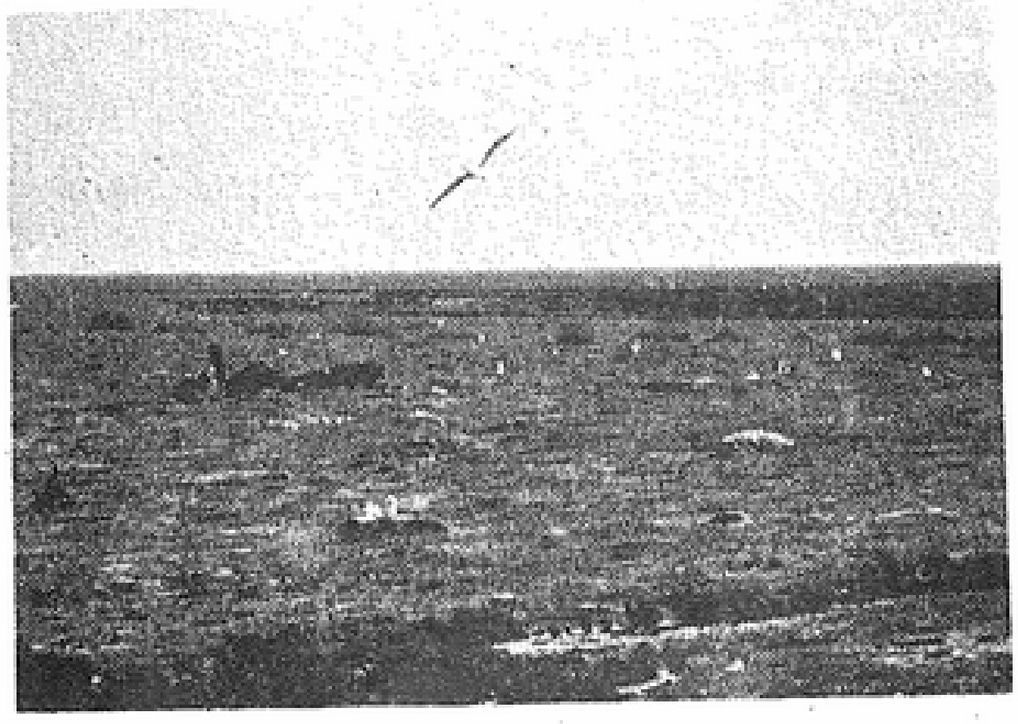
Our rough computer records also indicate that we worked over 1Ø3 DXCC countries, all continents and all 5Ø States. Fifty-four per cent of our contacts were on SSB, forty-six per cent on CW.

The rigs consisted of one Icom IC-72ØA, one Icom 73Ø (Thanks to K2GKK), one Ten-Tec Omni-D, one Kenwood TS-820S and a Kenwood TS-430S.

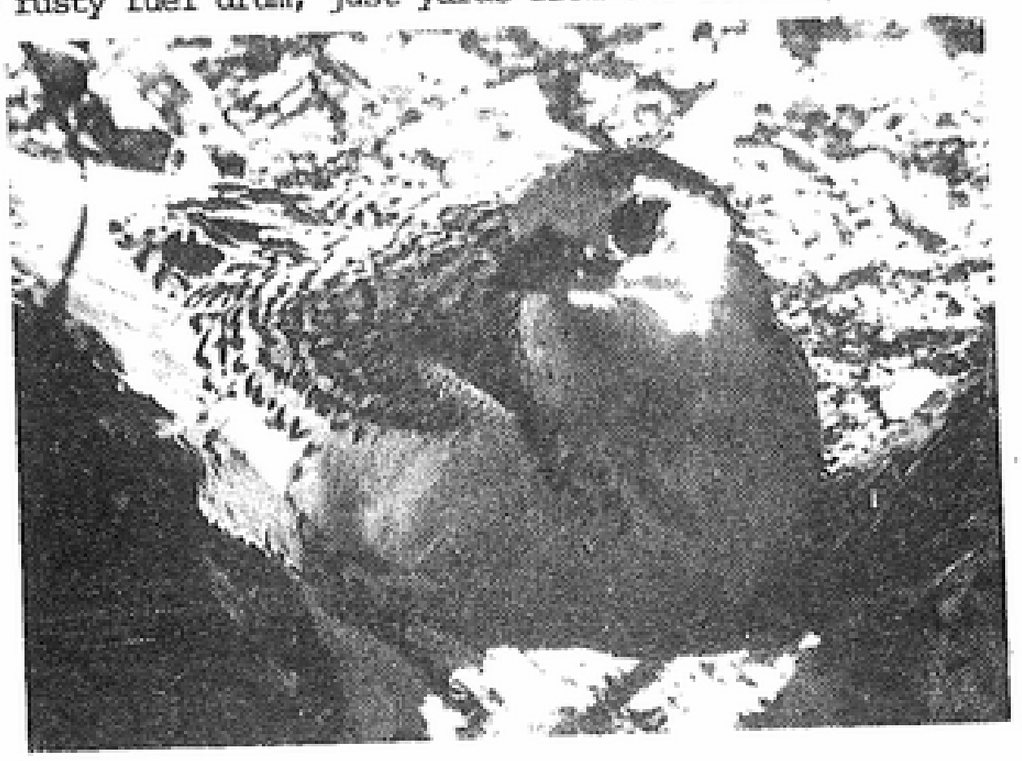


Above: Stu, WA2MOE working a 2Ø meter pileup while Stuart, H44SH makes rush repairs on the TH-3 beam. Derek Jarvis climbed the termite-infested wooden ladder on the side of the day-beacon to help us erect an inverted-vee.

We used two Butternut Verticals in addition to the TH-3 and a Kilo-Tec multi-band wire antenna. All antennas worked marvelously, though we soon learned that coral rock makes a poor counter-poise for a vertical, and the TH3 was blown over frequently by the near-Oklahoma velocity trade winds.



Above: An adult Masked Boobie swoops in to feed its chick, which stays on the ground silently in the hot equatorial sun. Below: Our camera caught a Boobie chick hiding inside a rusty fuel drum, just yards from our station sites.

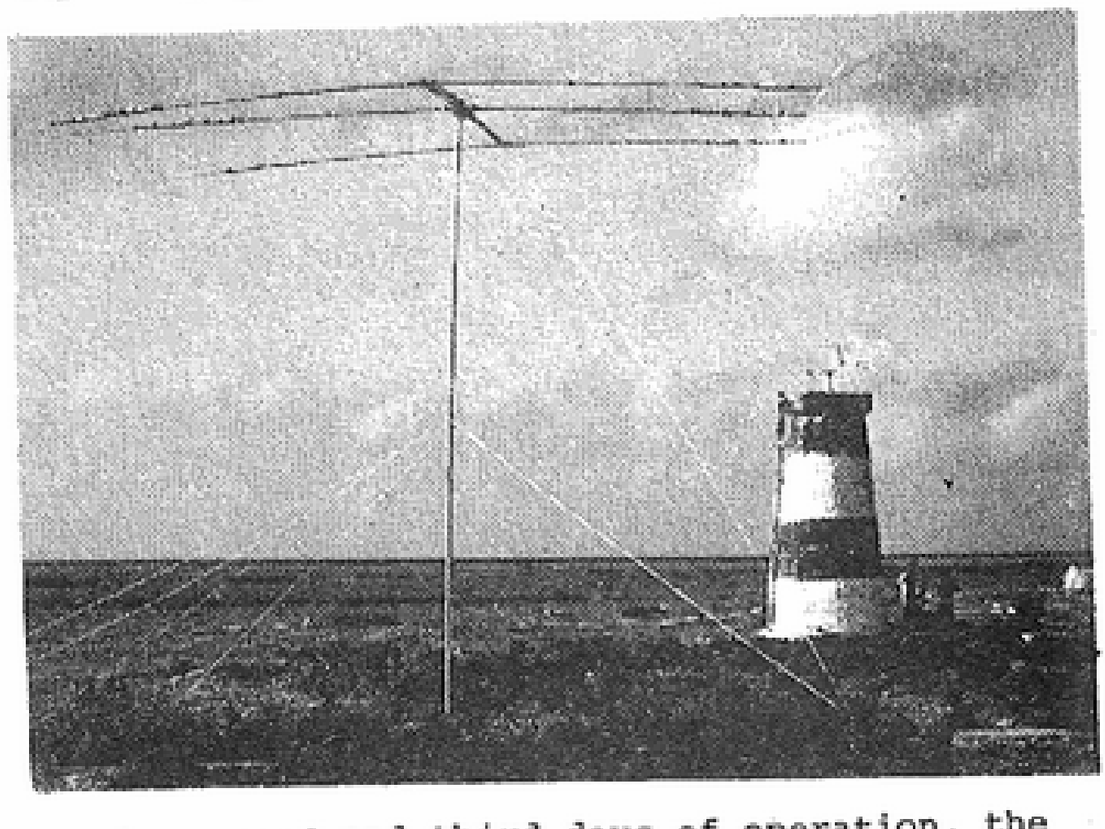


Our companion on the expedition was Cameron Kepler, Ph.D., research biologist for the U.S. Fish and Wildlife Service on Maui, Hawaii. Doctor Kepler is a real authority on seabirds and was very helpful throughout the trip.

Several trips were made around the island looking for any sign of the feral (wild) cats which had inhabited the island and contributed to the destruction of several bird colonies. However, he was pleased to announce that the cats had perished and the bird colonies were in excellent condition.

Kepler undertook a census of the bird colonies, and reported that over 35Ø,ØØØ Sooty Terns were then nesting on Jarvis Island. In addition, he documented nesting Masked Boobies, Goonie birds, Frigatebirds and other species which brought the total winged population to an estimated 5ØØ,ØØØ!

Above: Fearsome "Wild-Cat Hunters" from the Jarvis Island expedition. Pictured are, Left- Jeffrey Sanders, mate of the Farouche,and Right- Derek Jarvis.
Below: The Hy-Gain beam firmly guyed after being toppled repeatedly by the brisk southeast trade winds.



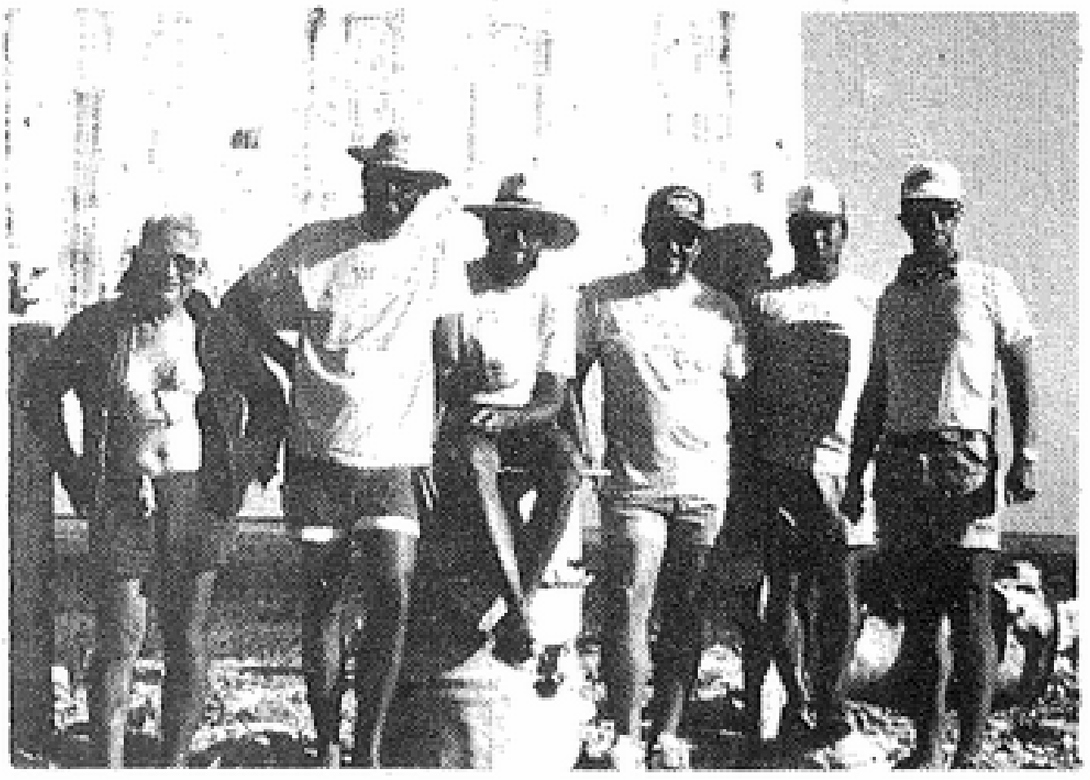
On the second and third days of operation, the operators became fatigued from the heat and lack of sleep. It was 1Ø5 degrees in the shade, sunburn happened in minutes and edema swelled our feet and legs. We chilled and shivered at night, even though the air temperature exceeded 8Ø degrees. It rained only once, for about three minutes while we were trying to catch some sleep. (Of course!)

At night we were joined by the Jarvis Island menagerie which consisted of huge Hermit crabs, curious field mice and hungry Carrion beetles. The latter are small black beetles which thrive on anything dead or decaying. When they came out at night, we had to careful of our blistered, bruised or lacerated feet less the beetles would set upon our wounds. Not painful, but a constant nuisance, if you get the picture.

The mice are tiny but abundant due to the demise of their natural enemy, the feral cat. They particularly liked to perch on the shoulder of Stuart, H44SH while he worked a pile-up.

Dawn broke on November 10, 1983 and our last day of operation. We slowly began to pack-- one step at a time-- and leaving the maximum number of stations on the air until the last possible moment.

Above: AD1S relaxes after the final QSO with KC4TJ at 2350 UTC on November 10, 1983. Go, Cowboys! Below: The "crew" of AD1S/KH5: Pictured left to right, Stu Greene, WA2MOE; Dr. Cameron Kepler; Derek Jarvis; AD1S; Stuart Honeysett, H44SH; and Burton Myers, M.D., W0RLX. The last hooo-rah.



The tired, sun-burned group at the last moment in our souvenir tee-shirts which appropriately ask "Where the Hell is Jarvis Island?"
We cast off at night-fall and promptly fell asleep for most of the 48-hour sail back to Christmas Island.
Thanks to the many Oklahoma hams who helped Vicki and I with this trip. We especially want to extend our appreciation to Mac, K2GKK; Guy, K5GL; Henry, N5IH; Dennis, WD5CSM; George, KA5-OFY; Reggy, WN5NWX; Ron, KE5M and all the fine members of the OK DX Association. It was great to hear familiar voices when far from home.

We will be showing the slides taken on Jarvis Island at the January meeting of the Oklahoma City Autopatch Association. Everyone is invited to attend and share all of the pictures and stories surrounding the 1983 DXpedition. Check the Autopatch column for date, time and place of the meeting. 73 de AD1S.

GREAT PLAINS A.R.C.

On Nov. 25th a boy was lost on the Ellington Ranch near Mutual,Ok. Members were called to help. Those responding: KD5JR,WB5EGZ.WB0PGD,WB0QGW,WB5EDD, NC5G,N5CCV,KB5XI,W5LUI,& K5YZK. On stand by:W5NDJ.

The group of amateurs helped provide communication between hunters and control,law enforcement officers, as well as helping hunt Tim. Tim was found about 2 miles up Persimmon Creek and in good health about 6:30P.M.

On Dec.4th we had our Annual Christmas Party at K-Bobs in Woodward. There were 20 members and lots of guests present.

After the meal our meeting was called to order. Three new amateurs were presented to the club for membership and voted in. They are KA5SDE,James Rockhold,Ka5SDF,Wayne Drake, and KA5PYA, Lois Ford.

Officers for 1984 were nominated &Elected:
President- Windle Hatchett,Wa5PLW
Vice Pres. Lewis Patterson,W5KEK
Secretary, Jim Phares, K5YZK
Tresurer, James Rockhold,KA5SDE
C & E Editor, Jim Phares,K5YZK
Activity Chairman-Gordon Richmond,KB5XI
Net Manager- Gerald Bowman, N5CCV

A motion was made and passed that the Section Manager and the Assistant West Gulf Director of ARRL (Area 2) be made life-time members of the club.

A report was made that the "73" machine should be on the line and working soon.

Remember: Our next meeting is Jan.3rd.

Merry Christmas,

K5YZK

FOR SALE: FT-301 Solid state XCVR. 280 w PEP, A-1 cond. 10 - 160 meters, w/WWV and auxillary. Crystal bank covers 0-30 freq.by adding crystals. Has 2 Air Force MARS, 3900, 7208 crystals. Has LSB, USB, CW, AM, & FSK. 25-100 crystal calibrator. Has RTTY, noise blanker, VOX, built in conrols for external VFO. Mic, Manual. Used one year. $475. Harry, KC5OU, Vici OK 73859. Phone (405) 995-4761.

WATT IS ELECTRICITY ?

Electricity is a colorless, odorless gas which burns with a bright flame.
Light grows from a bulb.
An AMP is a little animal that crawls along a wire. An AMP lives in an OHM. In summer an AMP lives in a COULOMB. POLARIZATION is the changing of an OHM into a COLOUMB?
An AMMETER is an animal that eats AMPS.
A BATTERY fires AMPS around a CIRCUIT. An AMP rides around the circuit on a MEGACYCLE. MEGACYCLES are parked on a GRID. Flemmings Right Hand Rule states that: All AMPS must ride their MEGACYCLES on the right hand side of the wire. A CHARGE occurs when all of the AMPS run down the circuit at the same time. All AMPS meet in an ACCUMULATOR.
An OERSTAD is an OHMSTEAD for ORSES.
A JOULE is a fight between two AMPS. You receive a shock when an AMP isn't wearing any shoes.
EDITOR'S NOTE: When WATT had read this he invented the STEAM engine as a decent alternative ... and was then prematurely retired to the old VOLTS OHM.
ANOTHER EDITORS NOTE: The above was picked up from Wireless Institu of Australia AMATEUR RADIO.

Below is a list of Oklahoma City Civil Defense warning sirens. On the first and third Saturday of each month (weather permitting), they are checked at 12:00 PM. If you are in the vicinity of one of these and want to help, check in on the 146.34/.94 repeater prior to 12:00 PM.

12 Water Tank, S W 89 & Linn
13 Fire Station #25, 2642 S W 59
14 John Adams School, S W 37 & Goff
16 Woodrun, W Reno & Czech-Hall Road
17 Westbury, 10200 S W 15 (@ Brinkenhead)

21 Southern Hills School, 7700 S Kentucky
23 Rancho Village School, 1401 W Johnston
24 McKinley School, S W 53 & Shartel
25 closed fire station, 3416 S Robinson
27 Penn-Moore Mid-High School, 9400 S Penn
28 OCPD Briefing Station, S W 89 & Santa Fe

31 Hayes School, 6900 S Byers
32 Hathaway Park, S E 38 & Lindsay
34 Bodine School, 5301 S Bryant

41 Lythe Park, N W 7 & Green Vale
42 Canadian River, 2200 S Portland
43 Jackson School, S W 26 & Villa
45 Westwood School, 1701 Exchange Avenue
47 easement, 901 N Oakdale (W of MacArthur)

51 OK County Courthouse, 320 W Robert S Kerr
52 Woodson School, 600 N High
53 Crooked Oak School, S E 15 & Eastern
54 Shidler School, S E 15 & Byers

61 4529 N W 36
62 Harlow Park, N W 19 & Harlow
63 closed fire station, 3801 N W 10
64 Madison School, N W 30 & Independence
65 Sequoyah School, 2400 N W 36

71 Memorial Park, 1236 N W 36
72 Hawthorne School, 2300 N W 15
73 Wilson School, 2215 N Walker
74 Jim Thorpe Building, 2102 N Lincoln Blvd
75 Fire Station #18, 700 N E 36
76 Fire Station #12, 2121 N Eastern
78 easement, 3045 N E 16 (rear)

81 Surrey Hills Elementary School
86 North Ridge Elem School, 8501 N W 82
83 Harvest Hills School, 8215 N W 104
85 Hefner Road (N W 108) & MacArthur
82 Wiley Post School, 6904 W Britton Road

91 Longfellow School, 1201 N E 48
92 Fire Station #17, 2716 N W 50
93 Burbank School, N W 65 & Independence
94 Fire Station #22, 1105 W Britton Road
95 Fire Station #15, 2817 N W 122
96 Coronado Heights, 5911 N Sapulpa
97 N Highland Park, N W 82 & Harvey

Lakes
1 - Draper / 2 - Hefner / 3 - Overholser

3 Mar 83 n5beq, jim

YOU KNOW IT'S YOUR DAY FOR NET CONTROL

WHEN...

1. The weather forecast is for lightning storms all day.
2. Your wife/husband says, "Tonight, let's go out to eat."
3. You wake up and the power is off.
4. Your child has a special event that only you can help out.
5. Your auxiliary generater wasn't returned from Field Day and your power is off.
6. You look for the rig that you took to the QSO party last night and it is no where around.
7. The newspaper lists tonight as the last night to see the show that you promised you'd take the family to see.
8. The pregnant dog starts to make a nest under the hamshack table.
9. The linking system to the repeaters suddenly starts malfunctioning..

From Pike County CAPACI

Salem

WHAT GOES AROUND COMES AROUND
(Or Shuffle Off to Buffalo)

Well, I can't really think of much happening that has fired the imagination of the general amateur population in recent times more than the flight of STS-9. Not that anybody gets more than a little excited about a Space Shuttle flight, but in this instance, a living breathing full fledged card carrying amateur radio operator was present on board in the person of Owen Garriot W5LFL along with his Motorola Black Box. Yeh, yeh, I know that the ARRL wouldn't say who made it, but we all know that it was a (ta da) Motorola, besides W5YI said it was made by those boys in Fort Lauderdale and Fred always tells it straight.

Now locally, we all cabbaged onto a different angle in the fact that astronaut Garriott is a local boy raised in Enid, Oklahoma. He knows all the important people there like K5CAY and the like. Besides, even closer to home for me, the University of Oklahoma was where he earned his first college degree. The fact that more than a couple of the expected astronaut passes were over the central US especially these old stomping grounds added a bit of local color to the event.

It is estimated that almost 200,000 amateurs and one Oklahoma City Police Officer tried to make contact with the amateur in the Shuttle. I was one of those guys. I know that I probably got my nose bloodied next to those Kahuna crushers like WB5DSH and K5JB and that idle ilk, but did that stop me when the going got rough? Darn right, it didn't. And I know you all out there. Didn't stop you either. You were probably right there in the fray slugging it out too. And for that matter, there were any number of people who were there slugging it out on the Shuttle downlink frequency making life miserable for the rest of the people pulling out their hair listening to the local half brains. Hey, when you really think of it, the number of people transmitting on the downlink frequency were really a small percentage of all those listening, but quite frankly, there was a real margin for error. It only took one itenerent transmission to blow it for everybody. Even living in the semi-isolated location of Normal, Oklahoma decreased the QRM potential from the locals, but I still heard them. Some of these were people who operated on the downlink as an accident. This can be understandable but disconcerting. It just can happen. It was the ones who kept stepping on the frequency continually and talking to others about and then the policemen come on frequency to blah, blah, yak, yak, get off his frequency, this is blah, blah, belch, yak, Shuttle Net Control. . . sure didn't increase the odds of hearing the 30 second transmissions for the rest of us.

This was a rather universal problem across the United States. And in those locations that are population centers, multiply what we had here by the appropriate fudge multiplication factor and you can see why the people in places like Chicago, Dallas etc were pulling their hair out. It actually became a circumstance where the worst antennas actually had a chance to hear Owen better than all the guys with firepower because the guys with the rubber ducks didn't have to listen to all the other drivel. Still only those running the Belchfire special 160 watt amplifier with the crosstwist curtain array on a manuverable array will have the opportunity to be heard by W5LFL and in this case, you don't have to hear him to work him. Two way QSL's will be issued to anyone whose call appears on the tape.

I am sure that there will be any number of other commentaries on this particular subject in other parts of this issue of the C & E unless the Christmas holidays have cooled everybody's jets. Pasteup being the day after Christmas certainly might change a schedule or two for getting material in. Who knows, but since heat will occasionally generate a little light and also since the First Amendment has not been yet repealed, I continue my ramblings. I guess that we can indict all amateurs for the sins of a few, but really, the squirrels constituted only a small, very small percentage. It is probably easy to say in retrospect that those whose operation was inadvertant on the downlink probably should be forgiven, but that really is just too easy. Let's just say we hope that they have learned their lesson. As to those buffalo breath cretins who intentionally jammed the frequency, well, well, we'll get to you later. All in all, it was still a load of fun.

I hadn't thought really very much about my chances to try to talk to W5LFL, but I darned sure wanted to hear him as he came whizzing over at 17,000 mph. I nosed around for a couple of weeks for a circularly polarized type antenna the type they said might work and I am glad that I didn't spend a lot of time on this project. It ultimately turned out that just about any old hank of wire sticking up in the air hauled in those space shuttle electromagnetic waves with ease. Even down to the short duckies. This made it easy when my uncle called and wanted to know if I heard Garriott and I could answer yes, I did and it sounded good. He lives in Enid and was a victim of the local press. I told him that I would bring my tape home over the Christmas holidays for his listening pleasure. I finally opted to just set up the old mobile station with the IC2AT, a KLM 60 watt amplifier and the Avanti 5/8 wave antenna. I heard everything that just about everybody else heard.

The Shuttle got off first thing Monday morning on November 28th right at 10:00 a.m. local time. It is a good thing too since the even hour made it easy to convert the elapsed mission time to listening times locally. They said that no amateur activity could be expected for the first couple of days and the first possible chance was Wednesday morning. I spent a couple of long distance calls to the ARRL hotline and got a list of orbital possibilities. Sounded good. The next project was to build up a cord to plug in from the IC2AT to my Marantz PMD 200 professional quality recorder. Since I would be at work during a couple of the passes, I had scrapped any plans to build up the antenna at the house and elected to go with the exclusive mobile setting. I wired everything up and tested it out a day or so before the first day.

On Wednesday, I sneaked out of the office a couple of minutes before the pass was scheduled. This was Orbit 34A. It looked to me that the central part of the United States would have several good opportuties to hear W5LFL. As I sat in the car, I heard the computer noise from inside the office coming in at a relatively strong S3 (No wonder, they call them Trash 80's). I started up the car and drove a couple of blocks away to the local sandwich shop emporium. I left the motor running and the heat on. Then it started, A few minutes into the scheduled acquisition time, here they come. A call or two on the Shuttle downlink frequency. Now, I have sat and listened to a couple of DX pileups and one thing became very clear that it is important to keep the frequency of the DX station clear. It started out with a couple of short carriers, a partial call and a "oops" then here come the policemen who would immediately jump in and identify and blast away at the offender for 5 to 10 seconds. Under these circumstances, identification by the policeman was neither mandatory

nor required. I really don't care who you are or whether or not you read what was going down, anything more than a short transmission was superflous. And if you are courteous about it, the dumbo transmitting on the downlink would probably realize what he was doing and move down.

Some of the jamming was honest mistakes. Others were clearly not. There probably was not a more odvious example of this than the 75 meter retransmissions that occurred during the flight. WA3NAN rebroadcast the Shuttle "Capcom" channel and I spent quite a bit of time listening to this fascinating bit of history. I also heard a couple of old geezers on Saturday night complaining about the loss of the frequency and blah blah, they don't give a damn about the shuttle and they wish it would come down and so on and so on. Later, during one listening period someone kept an almost constant key down carrier for about 45 minutes right on top of NAN. Several listeners came on with the normal invectives to describe this cretinistic behavior. Finally, somebody came on and very politely asked the station to move so he could hear the Shuttle rebroadcast and either the jammer lost his final or was touched by the sincerity of the request and left and that was that. I really can't see why somebody doesn't begrudge somebody a little bit of 75 meters just to listen to the Shuttle. One thing made the jamming rather insignificant and that was the unbelievable bodacious signal from NAN. It rapidly approached Kahuna status. You could probably drive a small car with the energy from that signal here in Oklahoma.

I wondered about all the signals that I heard on Wednesday morning and I wondered if somewhere in there was W5LFL. Upon comparing notes with K5JB for lunch, I learned that nobody had heard him and we later found out that he was not active. The next pass was that evening and I didn't hear him them, especially when somebody threw a dead carrier right on the frequency. Some of the local guys heard the far western pass on orbit 40D and it odviously must have been some tropo scatter. After the carrier came off the frequency, the invectives started which I understand carried on and over to one of the local repeaters. Well, we had the makings of a good VHF range war. Except that all the good guys are shooting at each other.

The next real chance to hear was Friday night about 6:45 p.m. By this time, the organization had improved considerably. Rod WB5DSH had swung into gear with his Oscar program and was churning out the anticipated times right down to the minute. Rod had great information. As soon as I got out into the car, I fired up the tape recorder and the radio. Well, here the policemen started again . Then I heard the ultimate. A local calling W5FLF. Not only was he on the wrong frequency, but he was also on the wrong call. Definitely a candidate for the peppermint flavored shoe award for foot in mouth disease. I didn't really mind him getting the call wrong, but he stirred up more policemen than you could shake a stick at. It is just like watching a Duck attack a june bug. And the problem was that the cure was worse than the disease. Then it came through just as clear as a bell, "You are received 5 x 9 by W5LFL in the Spacecraft Columbia, and will now be calling one more time for other calls, Calling CQ other stations, calling CQ, from the Spacecraft Columbia, this is W5LFL, W5LFL from the Spacecraft Columbia is calling CQ and I will be standing by . . .

Well, to be honest, I thought that it was a bootlegger since it sounded so clear. And it was broken up a couple of times by the local squirrels. People really get excited. I had to call around on the phone and check with others before I determined that, by Golly, that really was W5LFL. Well, it was shortly after this this one and only transmission that I heard that the squirrels and the policemen began to mix it up on the frequency and got into a discussion that ruined any possible chance to hear W5LFL again. Finally, somebody called a squirrel a name that, while an apt and appropriate descri.ion, was just a little too profane for the occassion The squirrel could only retort with the blockbuster response that his accuser was a "CBer." and so on and so on. Well, he got my curiousity up and just to verify the matter, when I got back to the house, I tuned up on the CB band and listened all up and down with frequencies with the 720 and didn't really hear anything quite as stupid as somebody talking on the downlink like the squirrel was doing. Based on this data, I came to the conclusion that it was better to be a CBer than stupid.

By an informal count and comparison with others and a review of the tape, I counted some 10 different cails on the downlink that night including a prominent club station call in Oklahoma City. Not really sure what you could do to pass the word to all these folks that they were transmitting on the Shuttle downlink, but I thought about sending each one of them an SWL card to verify my reception of their transmissions.

The next opportunity to hear Owen was Sunday morning during Orbit 71D. This time I was at home but since the mobile antenna had worked so well on Friday nite, I decided not to break up a winning combination. I wired up a tape recorder again. K5JB called me just before I went outside. We promised to compare notes. Here he comes! This time the first thing that I heard was LFL calling W5RRR, the club station at the Johnson Space Center in Houston. Again, a couple of transmissions during the pass from the squirrels, but W5LFL's signal was so strong that he covered them up. Whatakick! JB was on the phone when I got back inside the house. He got a pretty strong recording althoughhe .idn't hear him call RRR. There was so me talk that he would be on again on the next pass 90 minutes later, but that didn't pan out. At least, I didn't hear him.

I rolled out of bed early, for me, monday morning for Orbit 113A and carried all the equipment out to the car to listen. There had been some talk that this orbit might be preempted by some type of conversation with the President, but that apparently was reserved for Tuesday morning. Wednesday, the mission was extended and I heard him one more time that morning. He was on that afternoon, but I didn't get to hear him.

Well, this was quite a bit of excitement for a country boy. The tape recordings came out fairly well. I also managed to preserve some of the americana and local color regarding the various exchanges among those people who were vying for SWL cards from the rest of us for transmitting on the downlink. I guess when you take the numbers overall, this was not really too much of a problem, but it only takes a couple. Absolute discipline is a must in this instance, but that really is just a little too much to expect from a primarily volunteer service. It is disappointing to note that there were mentions of the methods for transmitting and listening in virtually every amateur pulication of note and still some people missed the boat. Interestingly enough, not only was W5LFL not listening on his transmit frequency, it has been reported by W5YI that the transceiver he had was not even capable of listening on 145.55 Mhz! Apparently the receive frequencies were stored in ROM and were dialed in and out with the 145.55 Mhz receive frequency being one of the omitted receive channels. Disappointment and embarrassment is a very appropriate emotion. There is no doubt that there were hundreds of people with their scanners listening to amateurs in at best a compromising situation. I know that there some at least, because I fielded several phone calls from nonamateurs the

week prior to the Shuttle takeoff with inquiries regarding time, frequencies, procedure, etc. And there should be no doubt that they heard him if they were listening. Goodness sakes, I heard him on a crummy mobile antenna, like gangbusters.

In fact, it was quite amazing how well the signals came booming in. I know several people who listened around with the short duckies and walkie talkies and heard the transmissions with full quieting signals some in steel buildings. One case in point is our local correspondent W5UXR who was on his way to an English class with his IC2AT and a short duck on the first floor of a 3 story brick building. Unconscious! WA5JXX was also listening down in Dallas in a concrete building and not only did he hear Garriott, he also heard a lot of the local Dallas squirrels. I was amazed at how many of the locals I heard on simplex. I was simply amazed at the number and kinds of mobile signals heard and the distances involved. Must have been a lot of people running amplifiers or tall antennas.

Now, to QSL? Seems to me that we are entitled to a separate card for each time we heard him. Right? Well, I intend to send one in. Owen will probably get a lifetime supply of QSL cards out of this. I think that he could easily have the first DXCC on two meters. W5NUT better watch out! The story so far on the QSL info according to W5YI is that the ARRL will get the tapes from Garriott, then go over them and prepare a master list, then possibly print it. If you want a Reception Report Card, then send a card as follows:

Reception Report - STS-9/Ham Radio
ARRL
Newington, Connecticutt, 06111

Enclose a QSL card or written note stating when you heard W5LFL along with an SASE. These envelopes should also identify applicants for the 2-way QSL. You might want to send two SASE along so that you can at least get your reception report card, then hold on while they identify the two-way cards. By december 6th, the League had already received 2 to 3 boxes of SWL reports with many more on tap. The outside of the cards are the same. Each actually folds open and the two-way card will have space inside for a written report.

By the way, W5YI also reports that Dale Martin KG5U, president of the Johnson Space Center Amateur Radio Club has requested that those of you who made audio tapes of your reception to send dubs to him. These will be compiled and given to Garriott who intends to use them to conduct propagation experiments regarding transmissions from the spacecraft. There are 194 different attitudes for the spacecraft that are used during the flight and the time and position of each is known. Garriott is interested in determining the propagation that existed for each attitude during the passes.

Send your audio tapes to Johnson Space Center ARC, Houston, Texas 77058. (No street or box address is needed). Along with your tapes you should indicate the orbit number, the exact time and date. Also include your name, call sign, address, location, and the equipment, including radio and antenna that you are using.

In other news, another accolade was bestowed on Dr. Garriott when his alma mater, the University of Oklahoma Amateur Radio Club (The Alpha Sigma Delta Radio Society) made him an honorary life member. This announcement got out just as the flight was nearing its end. This and a whole host of other newspaper articles were excellent press for both amateur radio and NASA. Let's hope that future "hams in space" operations will continue the good will and interest that has been generated to date. And there should be a possibility that NASA will allow it again. They were amazed at the interest and publicity that was generated. Astronaut Dr. Tony England WØORE will be flying in another shuttle in 1985.

Maybe some of the Scanner enthusiasts might get excited and want to get their licenses. Might want to get those posters up and crank out a license class or two and see what kind of excitement can be generated. And I hope the W5LFL stops by Norman to pick up his club membership. When he does, we'll unlock the secrets of the Big Kahuna for him and teach him the secret microphone grip. We even gave him a membership slot and number. Welcome back to earth!

Micheal Salem N5MS

THE PERFECT SQUELCH (TALE)
(The Big Kahuna Department)

The Big Kahuna in normally normal Norman is doing well. Things have been taking a couple of leaps instead of small steps. We have had a smattering of wind noise that appears to exist in the antenna, when the wind comes sweeping the plain. The antenna is commercial surplus, not in too bad shape, but out of band a little and a little old. I have been wanting to experiement with a resonant antenna for some time, so I bit the bullet and bought a brand new DB224 made by DB Products and told them to cut it for 147 Mhz. This automatically adds about $50.00 to the price, but they are pretty nice about it. They shipped in less than a week. Must be caught up down in Dallas.

The antenna was sort of a lark. The antenna we had was OK, but was going to have to come down for maintenance anyway. So I just decided that we might as well have another one to go up. WA5TOO got me thinking about it one evening at dinner. I told him to go ahead and order it and he did it the next day before I could change my mind. It seemed like a good solution to give us time to clean up the old one and put it back up.

Like I said, DB didn't let any aluminium grow under their feet, to coin a metaphor. Darrell ordered the antenna on a Friday and it was here in Norman and unwrapped by Thursday of the next week. I checked the weather foreghast for the weekend and it looked that we might have a go of it. Saturday morning, I rolled out of bed and found that the fog had rolled in pretty thick. It burned off before midmorning and we existed through a couple of very light rain showers. WA5TOO, KA5OHU and I climed the big mountain where the Big Kahuna lives. Actually, this means taking the elevator to the 11th floor. That is, Tim and Darrell got to ride the elevator. The new antenna was just a little too tall for the elevator necessitating a walkathon for me carrying both sections up the stairwell. The second part of the antenna was just as hard as the first section and I was huffing and puffing by the fifth floor. Meanwhile, Darrell prepared the site. When we got upstairs, we pulled the interlock on the Big Kahuna and I disconnected the antenna after peeling off the covering we put over the connectors.

Moisture is perhaps the worst enemy to the coaxial connector in an outdoor environment. It is absolutely necessary to clean and keep dry the connectors. Some people do this with the use of silicon inside the connector. Definitely a no, No. NO. The silicon has insulative properties, but it also acts like a capacitor and changes the characteristic impedence of the connector. Silicon also has a very bad habit called creep. It will cling

and climb between two close contact surfaces and form a thin insulating barrier between the surfaces. Everything will appear to be normal until you put RF or sometimes even DC through the connection. It is best to leave well enough alone and that means no silicon. Put the connector together and wrap it with one of the special putty type materials designed to keep it dry. WA5TOO probably has the best technique. Use the putty and wrap the connection splice from the bottom up and cover all the surfaces. Then tape plain ole electrical tape and start wrapping the connection from the top down and cover the putty. Make sure that the tape rolls on uniformly and cleanly. Darrell then paints the entire connection with one of the very stick compounds made by Scotch. This dries to a rather hard finish and under the circumstances, I would defy any water to get inside. The several months that we had the old antenna wrapped this way was virtually unchanged when I cut it off to put the new antenna on.

I loosened the clamps and KA5OHU and I lifted the old antenna out and let it slide down the top of the penthouse on the Waring Blender Physical Sciences Building. Darrell grabbed it and eased it down. He then handed the new antenna up and Tim and I balanced it round and round until it dropped in the clamps and we tightened it down. We lifted it up about a foot and attached it to the lightning part of the building and ran back inside.

I have to think that the antenna helped. It is nice to have a resonant antenna. It seemed to fill in a couple of the nulls around town and seemed to help along the fringes. Not sure really how much it helped because I was keying and using the repeater almost from Chandler during a sorie out and about. So I am not really sure that the old antenna was all that bad and a little clean up and repair could do it a world of good. One of the main reasons that we changed the antenna is that the nonresonant antenna changed the tuning of the finicky Kahuna from time to time. We found that putting a short length of cable in the line would detune the final amplifier. I never really trusted the bird inline wattmeter on some of its readings because it just didn't calculate out. I never expected the Kahuna to give efficiency of about 95%. Changes in antenna would change the power up and down. I had tuned the final to about 95 watts and came back in later about a month and it had slowly creeped down to 75 watts. A quick touch of the screen control and it was back up to snuff. It is just that the final amplifier is so finicky, it could give lessons to Morris the cat.

The antenna came as a bit of scheduled surgery. I later had a problem with the power supply which was not unexpected and perhaps a little overdue. The Motorola base Station is all solid state switching. There is only one relay in the entire radio and that is an interlock. The primary of the high voltage supply is switched with some SCR's and they are kind of hefty looking. The only problem is that after several years, the insulators that are used begin to carbonize and break down and pretty soon you are blowing six amp fuses in a fashion akin to a photographer using a flash at a burlesque house. This carbonizing has occurred in at least two other base stations of this type and in fact after spending a couple of hours digging through the Motorola service bulletins, I found one related to the problem. Anyway WA5TOO and KA5OHU hit the scene first shortly at the repeater went off the air. After some fancy footwork, Darrell isolated the problem to the same old problem. They pulled the power supply out of the rack and took it down to the shop to fix. Darrell whisked the insulators out and replaced them and then put in the new mica and boxed everything up. Tim and I took it back and took care of a couple of other small matters, then chunked it back in service and it lit up and has been working ever since.

We'll just have to see how the Kahuna survives from here.

It's a good thing that we got the antenna up when we did because the week before christmas became a weather nightmire for a lot of us. I declare, I aint never seen it so cold. Nothing like a good cold spell to test the new elements. Meanwhile, KA5OHU just acquired a new portable Kahuna amplifier. It takes the lowly power out from an IC2AT and converts it into enough energy to peel the hide off of the antenna coaxial connector if you are not really careful. His first installation went into the Avanti antenna. Unfortunately, through the glass only took one pass and the amplifier was cooked. Basic problem is that the Avanti is an end fed half wave antenna. The reason for this, as has been explained previously in these pages is to get the point of feed impedence up in the 2000-3000 ohm range so the capacitative reactance through the glass is insignificant compared feedpoint impedence of the antenna. This point is also a voltage maximum so if we assume 160 watts at the feedpoint and the antenna is tuned to a proper halfwave and is about 2500 ohms, then voltage at that point is

$$E^2 = P \times R$$
$$E^2 = 160 \times 2500$$

$$E = 632 \text{ Volts}$$

Now, if the impedence feedpoint should go up to 3000 ohms, you could be easily pushing 700 volts by the time the power went up to 160 watts. That is a lot of gas and it might be assumed that Tim's antenna ran out of range, voltagewise. The Avanti through the glass antenna uses a little matching network to couple to the halfwave antenna in an end fed manner. I am sure that there is some capacitor inside the matching network that has probably given up the ghost. Fortunately, the antenna matching network is easily replaced. In fact, if I can get Tim to wander up to Dayton this year, he will be able to buy a new matching network across the counter in the flea market.

Range checking at the high end of the spectrum showed that coverage was 30-35 miles from the repeater with no problems. He was hilltopping pretty good about 45 miles out and the last burp we heard was when he passed the Mulhall Exit on I-35 North and hilltopping and gone. This was about 60 miles. The Kahuna does not reside on top of a hill. The Physical Sciences building on the campus is only 200 feet tall, so this is pretty good. Fortunately, not everybody is running such power. For the typical 25-30 watt mobile, the repeater should be satisfactory out to about 25-30 miles or so.

Micheal Salem N5MS

REPEATER REPEATER ANTENNA ANTENNA FOR FOR FOUR SALE SAIL.

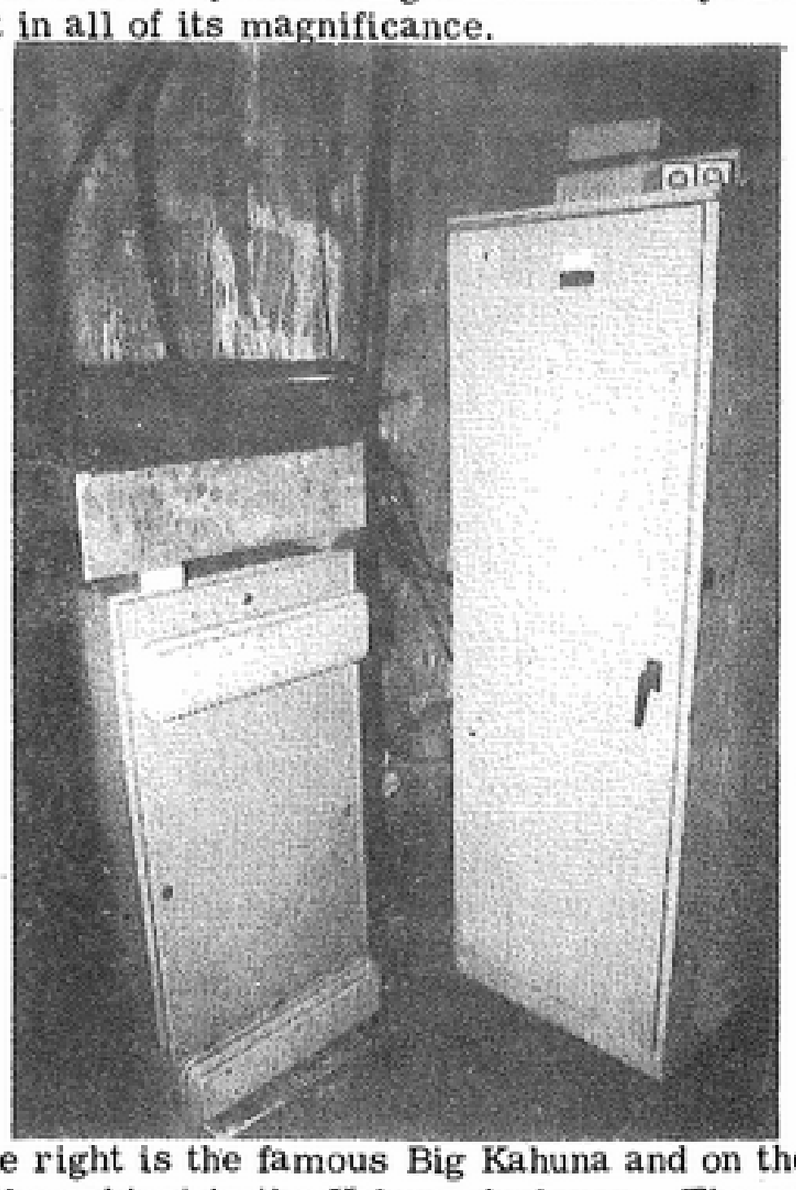
Well, odviously, when you have a new antenna up, you take the old one down and it is for sale. If somebody wanted to clean it up and maybe have somebody touch weld a couple of the elements to keep them from rattling, then they could have a first class DB264 antenna. This is the internal harness which is more ruggedized. The antenna served the 88 repeater well. The price is a mere $130 and you pick it up. For those with a lesser pocketbook, you can have a Hygain 6 db gain antenna for about $50.00 less. I only intend to keep one. Call 321-5453 or 360-1302.

Micheal Salem N5MS

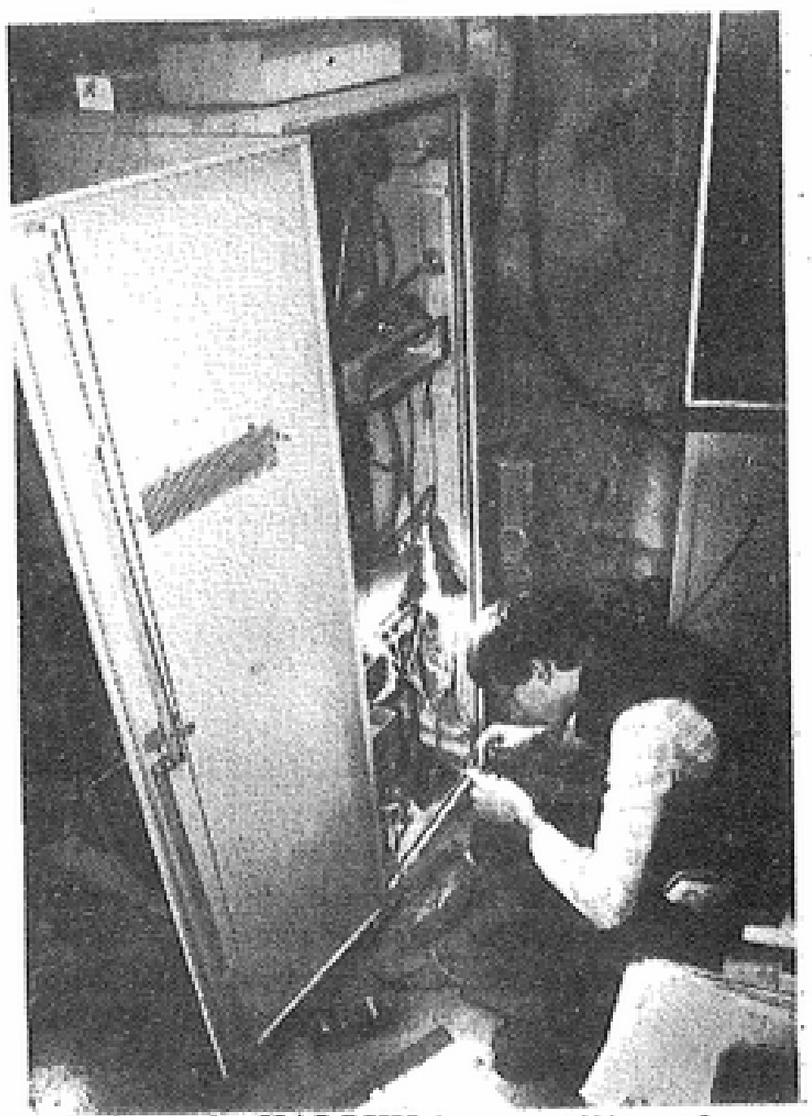
BIG KAHUNA UNCOVERED IN NORMAN!!

Our C & E cover photo this month is the lovely Big Kahuna of Norman. Unfortunately, our previous selection (Ms. T. Schwartz) was unavailable because of a recent emergency trip to ARRL Headquarters in Newington, Conn., seeking dispensation for an emergency anullment of her recent marriage to the truest bluest and cussedest DXer of them all (You know who I am talking about, know what I mean, there, Son?) It is actually unknown the actual reason for the requested dispensation, but a failed DXpedition to the Hymalayas is suspected. More on this unsubstantiated rumor as it develops.

The following picture is another view of the Kahuna from 25 feet away and using a 28 mm fisheye lense to get in all of its magnificance.

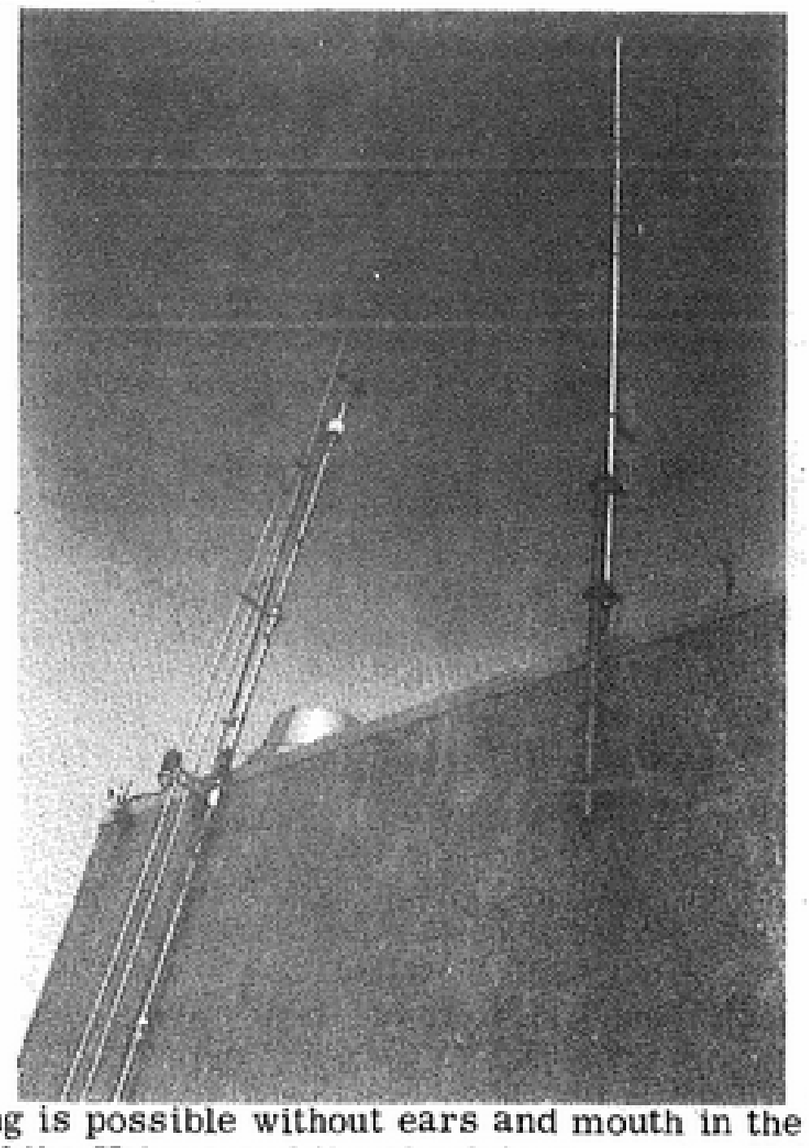


On the right is the famous Big Kahuna and on the left atop the cabinet is the Kahuna duplexer. The cabinet contains a special fan coolant heat sink to remove heat from the duplexer as the Kahuna switches on. Pipes from the cabinet go through the wall to a heat exchanger outside to remove the unwanted air. The hot air is recycled below the penthouse to heat the Physical Sciences building where the Kahuna resides.



Pictured above is KA5OHU in a position of respect bowing and scraping to the mighty Kahuna. Notice the engrossment in meditation. The Kahuna maint

tenance requirements are slight, but Tim bows and scrapes anyway to the jealous Kahuna. It is a mark of respect to bring your soldering iron to meet the Kahuna.



Nothing is possible without ears and mouth in the land of the Kahuna and the absolute sovereign Kahuna has about as good as there is. Above behold the two meter antenna on the right which is a custom cut DB-224 with 6 db gain in the omnidirectional pattern. On the left is the 10 meter side which is a rebuilt and reborn trombone type antenna for the link transceiver. Sharp eyed readers will spot the weather vane and other instruments atop the 10 meter antenna support which will provide wind speed, direction and outside air temp for the Kahuna.

Above is a more bushey eyed version of Kahuna subject KA5OHU who got a special KA call so that he would have the same first initials as his beloved Kahuna.

A brief description of our cover photo shows the naked Kahuna at work. This lovely old Motorola Base station features a stock 140 output (120 watt nominal) amplifier below the metering panel. Below that is the Motorola Control Shelf which has been modified to provide for reversion to regular repeater operation at the flick of a switchdo vso that the ACC Controller can be removed for repairs without disabling the repeater. Below the control panel is the exciter (15 watts out or so) and the receiver is below that. And lower still is the ACC RC-850 controller and a 19 inch card rack for the accessories including a custom Motorola Micor Squelch circuit card on the left. The Power supply is out of the picture to the bottom. The Big Kahuna, a Repeater's Repeater!

Micheal Salem N5MS

Q. R. Zedd

IF ONLY ZEDD WORKED W5LFL, IT WAS ONLY FAIR

Considerable consternation swept the western United States on the night of November 30 when W5LFL first came up on two meters from the space shuttle. Astronaut Owen Garriott naturally called "QRZ?" as the footprint of his antenna touched the U.S. during a pass over California, and naturally he got the answer one would expect, knowing the history of radio science and DX in the western world.

The QSO between the spaceman, W5LFL, and the holder of the world's only 1x1 callsign, Oklahoma's own Q. R. Zedd, A5A, lasted very nearly the entire duration of the west-to-southwest pass.

Here, for the ages, in a transcript of the QSO:

"QRZ?"

"YOU GOT HIM, SON, THIS IS ZEDD, A5A, COME ON BACK TO ME!

"All stations, please stand by. This is W5LFL. We will deviate from prestated plans in order to allow completion of this historic radio history first. Mr. Zedd, thank you for coming back to my call. This is a very great honor and I want to sincerely thank you for taking time from your busy DX schedule to honor me with a QSO. Thank you, Mr. Zedd, thank you so much. I am in tears. Over."

"THAT'S OKAY, SON. I UNDERSTAND. AN HONOR LIKE THIS DOES NOT COME TO EVERY MORTAL ALTHOUGH I DO TRY TO WORK ALL STATIONS. YOU ARE FIVE AND NINE AT HONOR ROLL RANCH, JUST A HOOT AND A HOLLER SOUTH OF NORMAN, OKLAHOMA. I SPELL NOVEMBER OSCAR ROMEO MIKE ALPHA NOVEMBER. AND YOU ARE FIVE AND NINE, FIVE AND NINE. HOW COPY? W5LFL THIS IS A5A, OVER."

"Oh, Mr. Zedd, this is such a high moment in my life I am overwhelmed. Please, Mr. Zedd, do you QSL? Are you okay in the Callbook? Do you require an SASE or a green stamp or both? If I get a longwire flung out of the cargo bay in time on the next pass, could you work me on one-sixty? A5A, this is W5LFL."

"OKAY, SON, YOU ARE IN THE LOG AND A SASE TO THE CALLBOOK ADDRESS IS FINE. WHAT IS MY REPORT? WHAT IS MY REPORT? OVER!"

"I am so sorry, sir, oh, please try to forgive me. You are five and nine, five and nine in space from W5LFL. The rig here is a handi with a window antenna. What are you running, sir?"

"OH, WE ARE RUNNING A SIMPLE TEN WATTS TO A TURNSTILE ANTENNA JUST LIKE THEY SAID TO DO IN QST. (Sound of laughter.) LIKE ALL GOOD DXERS I WOULD NEVER RUN MORE POWER THAN NECESSARY TO MAKE THE CONTACT. (More laughter.) HOW AM I MAKING IT INTO THAT THERE HAND-HELD OF YOURS, BOY?"

"Actually, Mr. Zedd, you blew my loudspeaker and heated up the rivets so badly that I am now holding the talkie in asbestos-lined gloves. There were some other stations calling, I think, but when you hit me with your signal, they were blotted out. Actually, I heard you at the same time we seem to have had loss of some heat tiles on the nose cone. the crew is investigating that; some sort of heating blast hit simultaneously with your signal. A5A, W5LFL."

"OKAY, SON, FINE BUSINESS. WELL, THE WEATHER HERE IS COOL AND OVERCAST, ABOUT FOUR DEGREES CENTIGRADE, AND THE RIG IS A KENWOOD INTO A LITTLE HOMEBREW LINEAR BUT OF COURSE IT IS IN THE STANDBY MODE. ANTENNA IS A TURNSTILE AIMED STRAIGHT UP. TONDELAYO, WATCH THAT COMPUTER TRACKING PROGRAM, HON! YOU WANT TO LOSE TRACK OF HIM? OKAY, BOY, I KNOW THERE ARE MANY OTHER STATIONS TRYING TO CALL SO I WILL GET OUT OF HERE SHORTLY BUT I DID JUST WANT TO TELL YOU THAT YOUR SIGNAL IS STRONGER NOW THAN WHEN I WORKED YOU EARLIER THROUGH MY SOUTH AFRICAN ANTENNA FARM AND THE BURIED ATLANTIC CABLE FEED. I GUESS THAT CABLE IS A LITTLE LOSSY, HI HI. HOW IS IT IN SPACE THERE, SON? W5LFL, A5A."

"Mr. Zedd, thank you for the report. I will QSL direct to your callbook address. Well, the space outside the ship is black and the temperature is about minus ninety with reflected sunlight on one side of the ship. Sir, the other members of the crew are witnessing this QSO and they want to know if there is any way they could get your autograph as a memento of the occasion."

"SURE, SON, NOTHING IS TOO GOOD FOR YOU SPACE BOYS. JUST HAVE THEM SEND ME A GREEN STAMP EACH ALONG WITH AN SASE AND I WILL SEND BACK AN AUTOGRAPHED PIC OF ME AND TONDELAYO STANDING IN FRONT OF MY 20-METER YAGI. OKAY?"

"Thank you, thank you --

"DON'T CRY LIKE THAT, SON, IT CHOKES ME ALL UP. I'M GLAD TO DO IT FOR YOU. OVER."

"It's just that you have always been my hero. Wait till I tell President Reagan and Roy Neal. And I thought blasting off into space was a thrill! I am so proud!"

"SON, YOU ARE STARTING TO BREAK UP. YOU ARE STARTING TO BREAK UP. HERE, LET ME GIVE THE MIKE TO OLE TONDELAYO FOR JUST A YOU SHOULD PARDON THE EXPRESSION QUICKIE. SO LONG, BOY. SEVENTY-THREE. I WILL GIVE YOU ANOTHER THRILL AND CALL YOU ON SOME LATER PASS. W5LFL, THIS IS A5A, AND HERE IS TONDELAYO. GO AHEAD, HONEY. TALK. I'LL RUN THE COMPUTER TRACKING MECHANISM...."

This concluded the first-pass business, except for a few words between W5LFL and Tondelayo Schwartz, Zedd's nubile, blonde, 20-year-old QSL secretary and nearly constant companion. It was noted, just before the shuttle went over the horizon, that W5LFL made one other contact at Zedd's request, that to Zedd's momma, Constance Wilhemina Zedd, in Mena, Ark. She worked the spacecraft on 2-meter CW from her Kawasaki 1000, which was probably also a first in radio history.

A few sourpuss hams complained that Zedd should not have used the entire pass for his contact and that of two friends, but cooler heads noted that even men such as W5LFL should be allowed some fringe benefits from their hazardous occupation.

And as leaders at NASA and the ARRL noted in a joint news release about the event, "Even spacemen have their heroes."

Tondelayo, in a brief interview after the event, was more succinct: "I swan, honey, it was only fair. He is the greatest!"

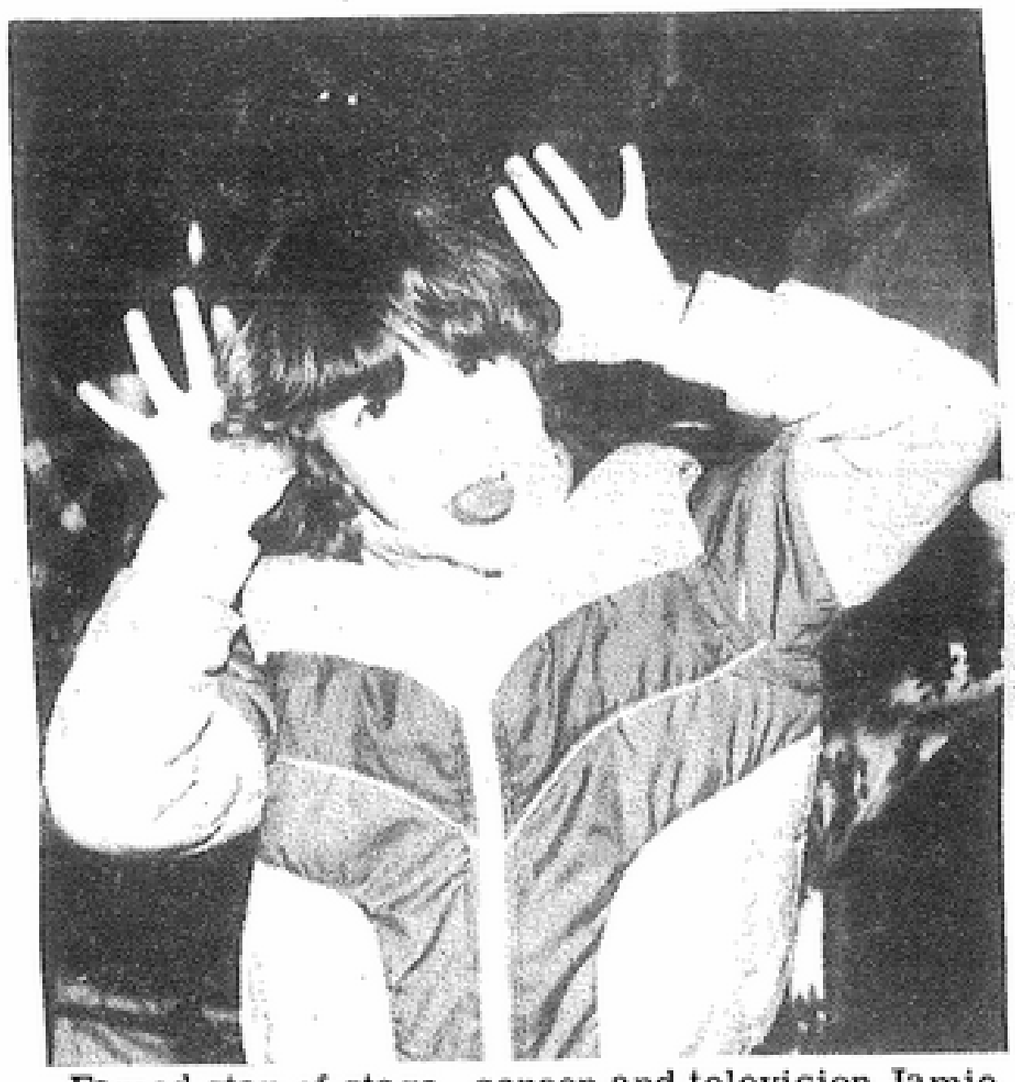
-- KU5B

CHILI TODAY, HOT TAMALE EDMOND AMATEUR RADIO CLUB ANNUAL CHILI AND STEW COOKOFF

It was a question of eat or die and members of the Edmond Amateur Radio Club didn't take long to gaze into the Chili and Stew Pots before making short work of the masterful creations of Stan WB5UIY and his wife Annette (they made the Chili) and Deeds WB5ADN and his wife Marge (ditto for the Stew. Other members and their wives and/or respective spouses fortified the rest of the crowd with such delicious accessories as cornbread (yum), chocolate chip cookies (unbelievable), potato chips and soft drinks (in copious quantities) all to the thrill and delight of all concerned.

The Big Chill Chili Champion Stan WB5UIY and Annette both put a fine shine on the cha cha chili. Other duties included consuming large quantities of same. Adequate libation was also available as well as symbolic handie talkie in the foreground for emergency directions to the pavilion scene generously furnished by Dave Harter WB5MIF. Great location for a party!!

Bill K5HTF and wife Joann won the Mr. and Mrs. Congeniality awards and persons who thought otherwise were soundly thrashed and forcefed famous WB5ADN stew brew at three times normal rate. Local civil rights groups protested the forcefeeding!



Famed star of stage, screen and television Jamie Orcutt, daughter of repeater trustee WB5ISN does famous moose impersonation of her daddy driving by the telephone company business office to pay repeater phone bill each month. This kid's got talent!!

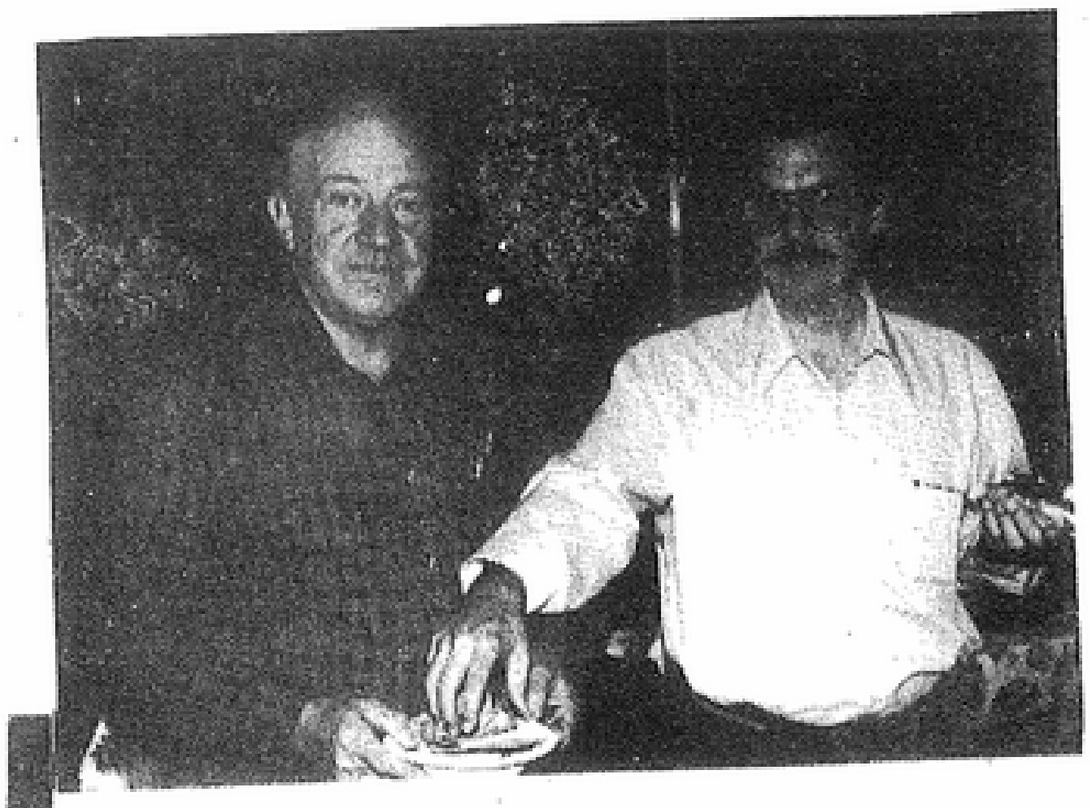
Barbara McCormick, wife of Gary WA5ETV, demonstrates winning smile that made her second runner up in the swim suit competition. Although not confirmed, it was rumored that talent scouts from Ultra Brite tooth paste were in the audience to sign her to an immediate contract as local state poster girl. The smile was captured while she was enroute between the cornbread and chocolate chip cookies.

(Halftones for all pictures including those of the Mighty Big Kahuna generously furnished by Jim Greenshields WD5HPU who has mastered the magical mysterious art of taking my color photographs and producing decent half tones (we still can't afford full tones. A tip of the C & E hat to Jumping Jim)

MORE! MORE! EDMOND AMATEUR RADIO CLUB CHILI AND STEW COOKOFF PHOTOS!!
(Because you asked for it!!)

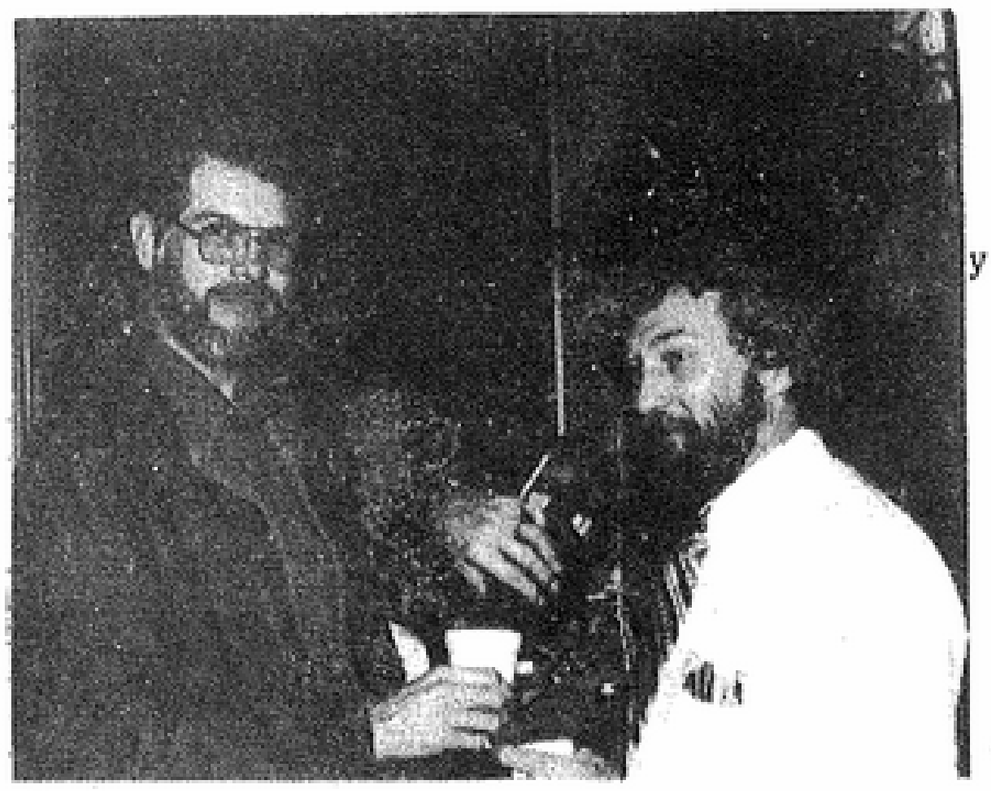
Below is not uncommon sight of WB5ISN, club repeater trustee making a raid on the donated funds for food treasury. Dennis has visions of repeater receiver voter dancing in his head and no hesitation to take food out of mouths of club members to achieve goal! All members were advised to count fingers before and after seeing Dennis and to wear special antiarmtwisting braces during conversations. Guarding the funds on behalf of the club is Jack Perry N5DWT who make a valiant effort to preserve club solvency, although unsuccessful.

Shuttle Diplomacy in action as Rod WB5DSH and sidekick Ron KA5RBM stop talking long enough to inquire where the electric toothpick dispenser is located. Rod became the patron saint of Shuttle STS/9 listeners locally with his deadly accurate predictions of acquisition of signals from W5LFL. Not many satellite freaks in town with the exception of this dude. What's happening guys? Let's get those az el antennas up in the air and in the groove!



Heavy Seven Up Mainliners Wendall WB5ISO and Joe WA5FLT, checking up the liquid refreshments in the best of the belly up to the bar tradition. This particular test (called the Maxwell House Test) is to check and see if Seven Up is "good to the last drop." Best kept secret of the evening was the fact that WA5FLT brought a dehydrated girl in his pocket. He later reconstituted her with bottle of alcoholic Champagne.

Get the Big Picture with Art Robers W1GOM, estwhile SCM for Oklahoma and wife Jane. Art is at point because of recent flyover from Chocolate Chip bird. Art's hands are in curled position because of recent dietary restriction requires that he drink air. New plans are formulated for chili attack and cornbread!



It is always a treat to meet for the December Club Meeting because of all the good friends and good food that is in plentiful supply all around. The EARC group still follows its format of a business meeting every other month and a family dinner meeting on the other months. Club members always enjoy the dinner meetings.

Micheal Salem N5MS

TRS 80C Central Oklahoma Computer Organization

COCO DEC. Minutes

Club Officers
PR - Bob Langmacher - 352-4059
VP - Tom Stott - 324-5086
SEC- Bill Wright - 341-6076

Meeting Place
Red Cross Building
10th and Hudson
First sat. at 9AM
Dues $5.00/year

Meeting called to order at 9:30 AM, Sat. Dec. 3rd, by Bob langmacher. 67 WERE PRESENT.

Bob said a word about the monthly tapes. These tapes are FREE, and if you can not return them for whatever reason, please do not get overly concerned about it. BUT- We have an average attendance of 50 to 60 people every month and only 12 to 15 tapes. Those who were not fleet-a-foot would also enjoy these programs and that can only happen if some of the tapes come back at the next meeting.

It seems that we may be seeing some problems between basic's. Two people at this month's meeting had trouble with SCRIPSIT, SPECT. and ELITE CALC. All, if I got it right were using COCO II. If anyone knows the cure, let me know.

OK, Everyone was talking at once on this, so I hope I got it right. The subject was monitors or in this case the lack of them. Everyone seem to agree that you do not need a High Res. monitor, a med. Res. monitor will do just fine. One man (no name) used a vic monitor with these changes.
Use Bob Grahams video board but replace the video Transistor that Bob used with a Darlinton (NPN) and replace a 1K resistor with 75 ohms.

Door prize winners were :
Leon Wilson -- Cassette case
Russel Moore -- Rainbow poster

ELECTION:
The nomination committee reported the names of Three people who were willing to serve AND before the sound of his voice died in the room ---- I was Elected Vice President. I've got to do something about being elected by acclamation.

NEW OFFICER's :
PRESIDENT -- Tom Stott
V. PRES. -- Holly Holcomb
Treasurer -- Miles Langmacher

The group split up for the different programs. In the main room, Steve Moore with a model III keyboard in his COCO and Ron Hilbun speaking on the ROM PAC Port. I took some newcomers off in the back room so no one would hear the dumb answers I was sure to give.

After most every one had gone, Ron Hilbun and I was talking about the disk contacts and there lousy connections. Ron was telling me about some gel that seal's the contacts from air so as to reduce oxidation. Steve Moore said he could get a lot of small bottles and with Ron's gel, we could make up small kits for the club. I was the only club officer present at the time so I OK'ed what ever money it was going to cost the club (not over $10). If this is unexceptable to the club at next months meeting, then I'll just have a lot of little bottles of gel... I wonder if the stuff, taste good??
Take care and happy computing!
Holly

UPGRADING YOUR COCO II

Hardware: 8 each, 64K memory chips #4164, 300ns access time or faster.

GETTING in the computer:

Lay the computer on a towel upside down, remove all screws on the bottom. Turn computer upright and remove top cover. Carefully remove keyboard by pull the ribbon cable out by the dark color base. The eight identical chips along the bottom of the printed circuit board are the old 16K chips. Note the small Vee notch and/or a small round mark on one end of the chip, remember which end they are on because that is pin #1 and the 64K chips must go back the same way. Using an IC extractor or a small screw drive, remove the chips. One side of the chips will try to come out faster then the other and will bend the chip leads so try to remove the chips evenly. Put the 16K chips away for use if a 64K chip ever fails.

Insert the 64K chips in the now empty sockets. NOW -- you have but one more thing to do, make one solder connection. Look for a small 'W1' in between the 6822 PIA chip and the SN74LS244 chip. Right above this 'W1' is two solder points.Solder these two points together and you have 64K...

The computer will tell you it only has 32K if you ask it to print MEM. That is because you will need some program like JUMP64K to use this new part of memory but any program that needs 64K will now run just fine.

If you would like to print more data without replacing your RADIO SHACK printer, you might want to try using a serial to parallel interface and use the printer's parallel input instead of the serial input. I had an idea that with my LINE PRINTER VII, I could at least use a higher baud rate and get more throughput. Imagine my surprise when I ran a test printing 10 full 80 character lines and got the following results.

BAUD RATE	INPUT MODE	TIME (SEC)	CHAR/ SEC	LINES/ MIN	TIME RED.
600	SERIAL	64.66	12.37	9.28	
600	PARALLEL	49.03	16.32	12.24	24%
1200	PARALLEL	41.39	19.33	14.50	36%
2400	PARALLEL	37.57	21.29	15.97	42%
4800	PARALLEL	36.01	22.22	16.66	44%
9600	PARALLEL	34.90	22.92	17.19	46%

I can only assume that the 'built-in' serial to parallel interface in the printer is less efficient than the 'inline' interface. That is the only way I can explain the 24% reduction in time at 600 baud.

Food for thought, huh?

Lewis Sample

PROGRAM : 64K

Utility written in BASIC language.

PURPOSE

Copies the BASIC ROMS over into RAM at the same addresses and turns a CoCo with the proper hardware installed into a 64k RAM machine.

TO USE

Just CLOAD the program and RUN. The screen will come back with the regular Tandy logo and you will be back in BASIC just like on start up, except now you can POKE to any address in the 64k or load in programs (ML) to the aree above the BASIC area.

CONTINUED ⟶

COMMENTS

Use to load programs written to run at &HC000 (such as ROMPACKS dumped to tape) into their "Home" address, and to put utilities such as "LISTMOD, JOYLIST, RSVIDEO, etc." out of reach of BASIC. Some versions of this program change the normal "OK" prompt to "64" to act as an indicator when in "ALL RAM" or "64K" mode.

B.H.

PROGRAM : TAPECHECK

Machine language utility written in position independent code (PIC).

PURPOSE

Tapechk reads the file information from the tape headers and puts it on the screen along with the error status.

TO USE

Load in TAPECHK (CLOADM/LOADM) and EXEC. The top half of the screen will fill with the form for the tape information and the bottom half will be blank. Play the tape you want to read and the form will fill in with information and the ASCII characters that match the code from the tape will file across the bottom of the screen. You may stop the information by stopping the tape machine, but of course you will get an error status report when you start it again.

TAPECHK does not control the motor switch on the tape machine, so if you want to read through a tape to find a certain program you can start anywhere and the screen info will change when each new program goes through.

COMMENT

Useful utility to find the "START, END ,XFER" addresses for machine language programs. These address's are displayed in Hex$ and the Transfer address is the same as the Exec. address.

B.H.

178 POKE

In the past few months there have been quite a few articles showing you how it is possible to display several colors on the high resolution screen using complicated programs. well, Jim Hall, a senior at Columbus Academy, has found a way to do just that ---- by poking address 178. The program listed below will display 255 graphics pattrns on the screen and help you understand a little more about graphics. For more information, see the Oct. issue of Rainbow.

```
3 PCLEAR8
4 'CLS
7 M=3:S=0
10 PMODEM,1:SCREEN1,S:PCLS
50 FOR X=12TO255 STEP17
60 FOR Y=2TO190 STEP 10
70 POKE 178,N:N=N+1:IFN=256
   THENX=999:Y=999:GOTO90
80 LINE(X,Y)-(X+10,Y+6),PSET,BF
90 NEXTY,X
95 SOUND100,1
100 H=0:V=0
110 X=12+H*17:Y=1+V*10
120 LINE(X,Y)-(X+12,Y+8),PSET,B
130 A$=INKEY$
140 LINE(X,Y)-(X+12,Y+8),PRESET,B
150 IFA$=""THEN120
155 N=H*19+V
160 IFA$=CHR$(8)THENH=H-1:IFH 0THENH=0
170 IFA$=CHR$(9)THENH=H+1:IFH 13THENH=13
180 IFA$=CHR$(94)THENV=V-1:IFV 0THENV=0
190 IFA$=CHR$(10)THENV=V+1:IFV 18THENV=18
191 IFN 255THENSOUND200,1:GOTO110
195 IF A$="/"ORA$="?"THEN300
200 IFA$=CHR$(32) THEN 400
205 IFA$="B"THEN
    PMODEM,5:SCREEN1,S:PCLS:POKE178,N
    :LINE(76,46)-(176,146),PSET,BF
    :FORQ=1TO200:NEXT:GOTO600
207 IFA$="M"THENM=M+1:IFM=5THENM=3
    :PMODEM,1:SCREEN1,S
    :ELSEPMODEM,1:SCREEN1,S
208 IFA$="S"THENS=S+1:IFS=2THENS=0:SCREEN1,S
    ELSESCREEN1,S
210 GOTO110
300 PRINTN
310 IFINKEY$=""THEN310ELSESCREEN1,S:GOTO110
400 PMODEM,5:SCREEN1,S: PCLS:COLORM+1,1:
    CIRCLE(126,96),65
410 POKE178,N
420 PAINT(126,96),,M+1
430 LINE(10,10)-(70,40),PSET,BF
440 FOR J=0TO180STEP35:
    LINE(40+J,180)-(255,180-J),PSET:NEXT
450 IFINKEY$=""THEN450ELSEGOTO600
600 FORZ=5TO1STEP-1
610 PMODEM,Z:SCREEN1,S:FORQ=1TO300:NEXTQ,Z
620 GOTO110
```

HOLLY

COMPUTING CALORIE CONSUMPTION

A recent report by the Oklahoma Medical Association pointed out that proper weight control and physical fitness cannot be attained by dieting alone. Many people engaged in sedentary occupations or hams spending long hours at a rig do not realize that calories can be burned by the hundreds by engaging in strenuous activities that do not require physical execise.
The following is a list of calorie burning activities and the number of caleries per hour they consume:

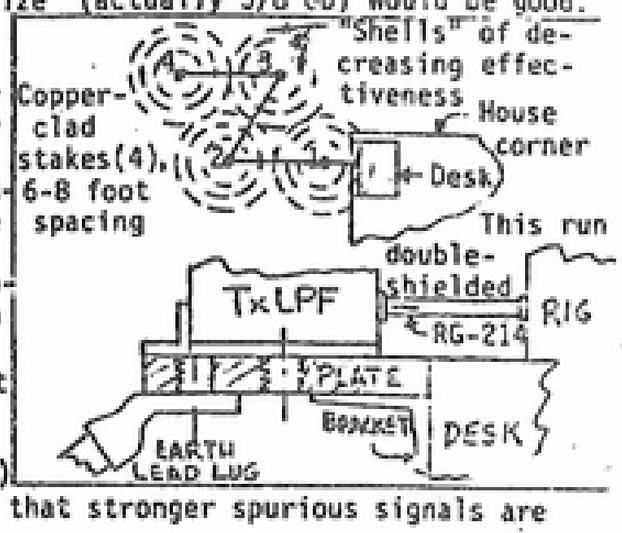
Beating around the bush	100
Jumping to conclusions	75
Climbing the walls	150
Swallowing one's pride	50
Passing the buck	25
Throwing one's weight around Depending on your weight	50 to 300
Dragging one's heels	100
Pushing one's luck	250
Making mountains out of molehills	500
Hitting the nail on the head	50
Wading through paperwork	300
Bending over backwards	75
Jumping on the bandwagon	200
Balancing the books	25
Running around in circles	350
Eating crow	225
Tooting one's own horn	1
Climbing the ladder of success	750
Pulling out all stops	75
Adding fuel to the fire	150
Wrapping it up at the day's end	12
Beating around the bush	100
Jumping to conclusions	75
Climbing the walls	150
Swallowing one's pride	50
Passing the buck	25
Throwing one's weight around Depending on your weight	50 to 300
Dragging one's heels	100
Pushing one's luck	250
Making mountains out of molehills	500
Hitting the nail on the head	50
Wading through paperwork	300
Bending over backwards	75
Jumping on the bandwagon	200
Balancing the books	25
Running around in circles	350
Eating crow	225
Tooting one's own horn	1
Climbing the ladder of success	750
Pulling out all stops	75
Adding fuel to the fire	150
Wrapping it up at the day's end	12

From Several Sources.

HOW TO WATCH CHANNEL 2 WHILE RUNNING A KILOWATT ON 10 METER CW. A SUCCESS STORY.
Dave Nichol, WD6AGN, runs a full kilowatt yet has no TVI on his neighbors' TV's or his own, and it doesn't even have a high-pass filter. Is he just lucky? Only partly, but mostly he's successful because he's taken heroic measures to prevent any TVI. Here's his story:

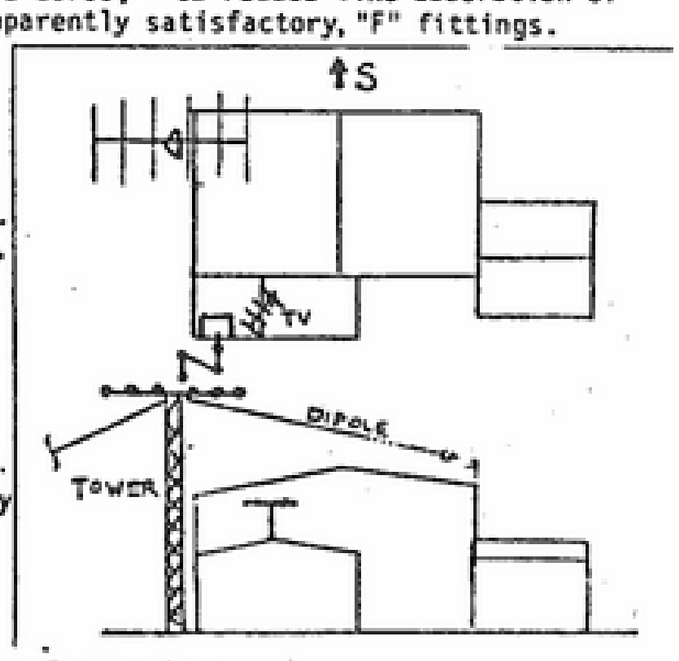
To prevent TVI you've got to do five important things:

1. Install the best station ground system (lowest lead impedance; lowest earth resistance) you can muster to eliminate radiation of currents on the outside of the ground lead.
   - 1.1 Use the shortest possible run to the first ground stake (for lowest lead inductance).
   - 1.2 Use the biggest ground cable you can find (also for lowest lead inductance). I use OO welding cable of 133,100 c.m.to stakes 1 and 2, then No.4 to 3 and 4. No. 8 solid has too little surface area. Several layers of braid are good, but tend to corrode easily. (Suggest 4 layers of silver-covered NAI 1253 braids?) Remember, we're not dealing with DC or AC for whichany small grounding-wire-to-prevent-shock-hazard would do, but with VHF RF strays. Copper pipe of "¾size" (actually 5/8"OD) would be good.
   - 1.3 Use the So. Calif. Edison ground system pattern of 4 8-ft. rods for lowest earth resistance.
   - 1.4 Mount an aluminum grounding plate along the rear of the equipment desk by four shelf brackets. My plate is 3/8 in. thick by 3 in. wide by 60 in. long. RF cables go through it with bulkhead fittings. Equipment grounds and the earth lead are attached by bolts into threaded holes in the plate, not by bolts and nuts. (Tapped holes provide about twice the grounding area of a through hole.) Mount the Tx L.P.F. to the plate with 4 bolts through case flanges into tapped holes, not relying on the 4-5 inches of braid for bonding. (If your L.P. filter doesn't have case flanges, add them with aluminum angles on sides and ends.)



2. Give the TV set the strongest possible signal, so that stronger spurious signals are needed to cause interference.
   - 2.1 Replace the TV antenna and lead-in every 3 years, because corrosion you can't even see will have taken place. Use husky solder lugs at the antenna and cover solder joints with 2 coats red finger-nail polish (red blocks the destructive ultra-violet rays of sunlight) and 2 coats of plastic spray to prevent moisture intrusion.
   - 2.2 Elevate the antenna to line-of-sight to Mt. Wilson, but no higher, since higher won't help and only adds additional unnecessary line loss. Keep below ham antenna(s).
   - 2.3 Use a high-gain (Medium, or Deep Fringe) antenna (even though you wouldn't need it for TV reception only) in order to: 1) capture the strongest TV signal; and 2) to thereby further reduce ham harmonic reception off the sides and back.
3. Isolate TV and ham antennas electrically and spacially as much as possible.
   - 3.1 Use a 300-to-75Ω Balun at the TV antenna and RG-59 feed line (even though co-ax has double the loss of ribbon). Use genuine RG-59C line (95% braid solidity), or better (mine) Columbia C5750 or best Columbia C5760, to reduce line absorbtion of ham signals. I use the much-maligned, but apparently satisfactory, "F" fittings.
   - 3.2 Make sure antenna tubing, masts, and metal objects are bonded across to prevent "diode rectification" and its harmonic generation from the strong ham fundamental power.
   - 3.3 Locate ham antenna(s) far to the side of TV antenna, and in L.A. basin, south of is best. Maximize horizontal and vertical separations.
4. Get a good TV set that must have, for the ham energy that falls on the TV antenna:
   1) adequate selectivity, to reject the near-in-frequency-but-weak ham harmonics; and
   2) cross-mod tolerance to handle the far-removed-in-frequency-but-strong ham fundamental.
5. Be lucky. My choice of an RCA 25" console (comparative TV rejection figures impossible to come by for selection purposes), and a house plan that allows all the above. ---WD6AGN as told to K6KH

P.S. If this isn't enough, our next installment will cover TV Hi-pass filters. --K6KH



Tnx - Northrop Radio Club

December 21,1983

Joe Harding, WA5ZNP
Managing Editor, CQRA C & E
P.O. Box 15013
Del City, OK 73155

Dear Joe:

The following item is being submitted for use in the C & E if you desire to use it. It appeared in the Oklahoma Bar Journal Vol. 54- No 47 dated December 17, 1983.

ATTORNEY NAMED FOR ACLU AWARD

Michael Salem, Norman attorney, will receive the Angie Debo Civil Liberties Award for 1983 at the ACLU Bill of Rights Celebration January 8, 1984 at 3 p.m. at the Hall of Fame Inn in Oklahoma City. Reservation information available by calling (405) 524-8511.

Mr. Salem represents the plaintiffs as a volunteer attorney for the ACLU in Bell vs. Little Axe, a nationally important constitutional dispute over separation of church and state. The award was established in 1977 to recognize Oklahomans who have made significant civil liberties contributions to society.

I feel the Oklahoma hams will be interested in knowing of this honor to one of our fellow ham's. He certainly contributes much to the Oklahoma ham community with his C & E material.

Sincerely,

Reo NM5U
Box 403
Edmond, OK 73083

Club
NEWS
PILOT

Merry Christmas Meeting

Regular business meeting this month was replaced by a joint Christmas Party with the Aeronautical Center Amateur Radio Club held at Red Cross headquarters. About 30 folks were there and participated in a covered dish dinner. It was a jolly time. The VHF Club wishes all our amateur radio brothers and sisters continued joy throughout the new year.

Joe, K5JB, Secy

Packet Radio Report - Finally, Progress

The first Terminal Node Controllers (TNC's) from both Tucson Amateur Packet Radio Corp. (TAPR) and GLB Electronics arrived last month!

To refresh your memory, TNCs go between a computer, or some other kind of terminal device, and a transceiver to permit sending information over the radio using state of the art packet switching techniques. the TNC acts like something to send data to and something to receive data from. It makes a connection with another TNC located somewhere and guarantees the information transferred is complete and correct. A node is a point on a network diagram where information enters and leaves the network.

The first available TNCs were from a Vancouver B.C. group which pioneered the mode, (Vancouver Digital Communications Group, VADCG) and a Tucson AZ group (Tucson Amateur Packet Radio Corp) that developed a kit based on a little different protocol called AX.25. The Vancouver group's protocol is called VADCG. Both protocols send blocks of information preceeded with headers and trailers containing address, status and error checking information.

Two TAPR boards arrived shortly after I did last month's column and they were promptly pounced on and assembled by Jim, KB5XN, and me. It didn't take very long (six hours construction time each) and we had them on the air, testing. The first evening on the air was only partially successful because audio level settings were extremely critical. Even after finding settings that would work, something would happen and one or the other TNC would appear to go deaf. After a few days of considering the problem, Jim gave me his TNC so I could do some A-B comparison and side-by-side trouble shooting.

After a few hours of running down blind alleys, the main problem was found to be the transmit audio characteristics of my Icom IC-230. Two things were happening. A monitoring receiver, used for reference purposes, showed a significant recovered audio difference between the IC-230 and an IC-2AT. Where the 1200 and 2200 Hz tones from the IC-230 were recovered at the same amplitude, these tones from the IC-2AT differed by 3dB or more, depending on drive level and automatic deviation limiter action. The higher frequency tone was at lower amplitude (as it should have been). The TNC's audio input filter circuit was designed assuming an audio recovery like that from the IC-2AT and was boosting the high tone from the IC-230, causing problems. After creating some roll off on the IC-230's Transmitted audio, reliability jumped to over 95 percent packets recognized. (More on that later.)

This still was aggravating since the bench top environment should provide nearly 100% reliability. One other apparent problem was extended key-up delay required on the IC-230. A 560 ms delay time (between keying and sending data) had to be increased to 1020 ms. The rig was keying fast enough but the audio tones sounded slow in reaching full amplitude. After checking everything, and even looking all around for a substitute XR-2206, I tried another trouble shooting technique from the old bag of tricks... Hook up another rig!

That did it! I called Jim and was telling him about it while one TNC was sending a beacon to the other. It must have sent 40 or 80 beacons without a hit while we marvelled over it.

After spending a little time documenting the results to this point, I went back and spent a little more time on the IC-230 problem. There had to be a simple reason why the thing was so cranky and why the audio seemed to have a reverse AGC. The answer was discovered after the pressure of getting the system on-line was relieved. (Isn't that often the case?) The rig was over deviating. Deviation level on that rig had been set a long time ago with a high dollar monitor and I was pretty sure it was limited to 5 KHz so had not suspected a thing wrong with that. However, when the transmitter was hit with the TNC's audio, it first transmitted an over-deviated signal which the receiver recovered and presented as reduced audio. Turning the audio up a little more than the AGC could handle caused the 2200 HZ tone to go away completely!) What I first thought was some kind of reverse AGC was actually the transmitter's microphone circuit AGC bringing the deviation down, and thus back into the passband of the receiver.

The IC-230 is still presenting some problems but Jim and I are beginning to overcome them. There are some more thoughts on the subject later.

I don't regret having the problem (now) because it gave me an opportunity to closely review some of the circuitry. Had I been able to 'Drive it off the lot' it might have been quite some time before the novelty wore off and I started digging. (At least a couple of weeks.)

The third TNC, an assembled and tested unit from GLB, the synthesizer people, was so simple to get on line it was ridiculous. I ordered this one as soon as I saw the ad because 1. It is a hundred bucks cheaper than the TAPR TNC, and, 2. The next TNC's from TAPR won't be arriving until about February.

The two TNC's are as different as they can possibly be. Where TAPR used hardware to get SDLC (synchronous data link control), GLB did it all in software. The GLB (called PK1) TNC uses a Z-80A microprocessor running slightly less than 4 MHz. It's operating system is contained in a 2764 8K EPROM and it comes standard with 4K of RAM, which can be expanded.

Let's back up a little with the comparisons and start with the price. The TAPR kit costs $242.00, the GLB comes assembled and tested at $149.95. The TAPR TNC is somewhat bigger at 11 by 6.5 inches to the GLB's 4.5 by 9.5. The TAPR includes 3 voltage power supply, the GLB requires addition of a single 12 volt supply. The TAPR comes with all necessary connectors. The GLB does not. With the latter it is necessary to scrounge up a 40 pin, 1/10 in. centers edge connector or buy a couple of 10 pin connectors ($2.95 ea. from GLB). GLB has all the necessary extra parts for a price. Cabinet, power supply, and connectors are available for about fifty three extra bucks, bringing cost of a complete system up to around $205.00, counting shipping.

It will be interesting to see what the TAPR board will cost if a commercial interprise starts manufacturing it. Up to this point it has been a voluntary operation by a bunch of packet radio zealots, very professional bunch I might add.

Back to the comparisons...

The TAPR TNC contains an (almost) non-volatile

RAM. I have had to reprogram mine twice but that's no big deal. One just types 'perm' after amateur call and other personalizations are entered, and it is done. The GLB has to have several parameters typed in on power-up.

A typical session goes like:

Flip on the power.
RETURN (ENTER) (this sets terminal baud rate
SBD (ignores open squelch)
SCK5JB (sets my call in memory)
SA3 (sets my VADCG address)

to make a connection...

SDKB5XN (the only other guy in town with packet)
AC (to request a connect)

if connection is successful...

I (to insert text in buffer)
Howdy Jim (the text)
ESCAPE (end of text)
AT (to transmit text)
AD (to disconnect)
MI (to send CW ID)

To do the same thing on the TAPR TNC, turn on the power and type:

CONNECT KB5XN (CW ID is automatic)

If connection is successful, type:

Howdy Jim

RETURN (ENTER) (packet is sent)

To disconnect, type:

DISCONNECT (or DISC)

9 1/2 minutes after you start, it sends another CW ID.

And that's it. Both of these things have a lot of commands. The TAPR has 73 and the GLB has over 50. Neither requires learning more than a few to get on the air. The great number of commands come into play when one decides to experiment with some of the available modes and variations.

There is a considerable difference in documentation between the TAPR and GLB TNC's. The TAPR kit comes with a beautifully written and bound looseleaf notebook with about 1 3/4 inches of documentation indexed with tab dividers. Some paper could have been saved by printing on both sides of the pages but perhaps they wanted to leave room for notes, or something. As one would expect, since it is a kit and TAPR is an R&D group, documentation is very thorough. What is not contained therein appears to be covered in the bibliography.

On the other hand, since the GLB is not a kit, its documention is rather sparce, containing twenty five printed pages and lacking a schematic of the thing. In case of trouble, a knowlegable amateur could troubleshoot the analog circuits by examining the board and visually tracing out circuits. If one had on hand specifications for the devices contained on the GLB TNC he could probably set tone frequencies and find obvious defects but, by and large, this board would have to go back to GLB for repair. All the documentation says about three of the pots on the board is 'Factory adjustment' or 'Do not adjust'. Both TNC's documentation are complete enough for a knowlegable amateur radio operator to get them up and running but for a thorough understanding of what is going on the TAPR material is superior.

At the bottom of the first page of the GLB material is a reference to "Synchronous Packet Radio Using the Software Approach, Volume I", Richcraft Engineering Ltd., #1 Wahmeda Industrial Park, Chautauqua NY 14722, $22.00. This would probably be the reference to have if one is contemplating using a computer to emulate a Terminal Node Controller. It would also probably shed some light on how the GLB TNC works.

Neither TNC documentation contains source code for the operating system though the TAPR board itself contains a monitor that permits examining memory and performing most of the other normally expected debugging features. The GLB accepts commands that permit some analysis and customization of the packet header but that is about it. The GLB does have one mode that I have not been able to duplicate on the TAPR. If commanded, it will go into 'Garbage' mode and display flawed packets. This is really helpful while getting set up and will be helpful also under noisy conditions because one can guess content of a message if only a few characters are hit but normal error checking won't permit display of a flawed packet at all. Because of this special feature, Jim is calling the GLB TNC the GIGO unit (Garbage In Garbage Out).

The TAPR TNC contains 32 IC's and one power FET, the GLB contains 13 IC's and five transistors. While the TAPR unit will key a 200 ma push to talk line almost to ground zero with its power FET, the GLB will only handle 50 ma. An interface circuit will be necessary to key my IC-230 which develops 100 ma on the keying line. More on interfacing later.

The TAPR TNC runs both VADCG (Vancouver) and AX.25 (AMRAD) protocols. The GLB runs only the VADCG but is working on a PROM that will contain both. It is supposed to be available in January and will be a must because future expansion of packet radio will require flexibility of the AX.25. Satellite operations will use the AX.25. I have been unable to get the GLB to operate in repeater mode, either as a repeater or as a terminal, sending packets to the other TNC and back to itself. The TAPR board has been tested in this mode both in AX.25 and VADCG protocol.

Interfacing between the two TNCs and other equipment is slightly different. The TAPR board uses plus and minus 12 volts normally found in RS-232 circuits and includes RTS (request to send) and CTS (clear to send) circuits for hardware flow control. The GLB does not correctly use the RS-232 signalling standard. It uses zero and plus 12 volts instead of plus and minus voltages. Some computers and such are guilty of this also and should work fine unless the terminal equipment uses TTL levels of zero and plus 5 volts. One must be cautious to prevent damage from this incompatability. Thus far, I have only used my Radio Shack Model 100 as a terminal on the GLB and there has not been any problem I am aware of. The Model 100 does use plus and minus voltages on the RS-232 port but it seems to be satisfied when it sees a zero rather than minus.

The GLB connects to most computer and terminal equipment running from 45 to 9600 bits per second, ASCII or Baudot, though I doubt it will ever see more than 110 bps Baudot. I am having a bit of trouble losing characters dumped to it at 300 baud ASCII right after the carriage returns but I think I can work that out without going into the block data transfer mode. This mode will require writing an I/O driver for the computer that prefaces blocks with byte count and awaits a 'go ahead on' prompt from the TNC. This stuff ain't for lightweights so ya wanna get ready to learn yer computering if you wanna play the game with this baby.

I don't think the TAPR board handles Baudot. ASCII data is handled from 50 to 19,200 bps and initial setting is established on power up with an auto baud routine. After communications is established, Baud, parity, and word

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length are stored in ANOVRAM (Almost NOn-Volatile RAM by Xicor) by the PERM command. Next power up recalls these values if the ANOVRAM is enabled and hasn't forgotten what it is supposed to be doing.

The TAPR board has ability to change serial port parameters on command. They actually change after a RESET command is given. During a one on one exchange with another amateur, it might be desirable to crank up the terminal baud rate to 1200 in order to not bottle neck data getting in and out of the computer. With all the messing around so far I have not caused any delay with the computer set at 300 Baud. To restore lower speeds it would be necessary to talk to the board at the higher baud rate or reset the thing. (This would be undesirable if connected to another TNC.)

The TAPR board seems to handle text dumped from the computer with no loss of characters. When it's buffer is almost full it will issue an XOFF (defined by the user), or if hardware handshaking is chosen, will make CTS (clear to send) false until it has room in the buffer.

Speaking of buffers, the GLB TNC comes equipped with 4K of RAM which is shared by the operating system and transmit and receive buffers. The operating system needs about 200 bytes. A section between 250 and 1750 bytes is reserved for the transmit buffer. The rest of contiguous memory is available for receive buffering. The board is capable of being expanded with byte wide RAM or ROM to a 64K maximum.

The TAPR TNC comes equipped with 32K of ROM and 8K of RAM. With the mapping supplied, up to an additional 16K of RAM, ROM, or whatever may be plugged into the TNC. Replacing of the memory mapping decoder permits other configurations without modifying the board. 4K out of the possible 64K addressing of the 6809 processor is needed by the I/O memory mapping.

The NOVRAM has two 64 byte blocks that are used for storing personal preferences that are to be read into RAM during power-up. The two blocks are switch selectable so two different sets of parameters can be readily available if the TNC is to be used for widely different applications.

If one is into radio Teletype, and is using a Baudot machine, the GLB board is capable of a nifty form of autostart operation. A circuit diagram is included that watches for data on the 'RS-232' RXD (receive data) line. When it goes low, indicating data is arriving, it turns on the printer motor and holds it on as long as data is being received. This circuit is available from GLB for $12.95. For that price they will probably send a circuit that works because the one on the documentation won't. While all the mark and space conventions are respected, the motor needs aren't. The motor needs to run when data is arriving and not when things are idle.

Both TNC documentations go into quite a bit of detail on how to connect to the transceiver equipment. Audio shaping is of serious concern because, since they are FM, these radios are being pushed to their limits to handle 1200 Baud FSK. There is a certain lack of standardation between designers regarding pre-emphasis, de-emphasis and in the case of phase modulation, pre-distorters. This is simply because specifications can be pretty sloppy as far as voice is concerned and the words still get through. Very few of my rigs have survived my critical ears (worn out as they are) without some kind of transmitter audio modification. It is true that we might expect the audio circuits to handle a 3 KHz tone at 5 KHz deviation but that is a sinusodial wave. In theory these conditions would require about 22 KHz bandwidth (Bandwidth equals two times the modulating frequency times the sum of modulation index plus two. Modulation index is deviation divided by modulation frequency.) A reasonbly good 2 Meter receiver will have approximately fifteen KHz bandwidth in its IF section (design problem number one - not wide enough). The 1200 Hz shifting between 1200 and 2200 Hz tones would require an extremely wide bandwidth if it was instantaneous. In fact it is instantaneous when it starts out, but after it is filtered by both transmitter and receiver circuits it is no longer a faithful representation of the waveform originally generated. Given the restraints of 5 kHz deviation and a receiver bandwidth of 15 KHz, we can only handle 1250 Hz modulating frequency. Guess what folks, that is only the fundamental of the supposed to be square wave. Ergo, sine wave from what was once a square wave. Our salvation comes from the XR-2206 which creates phase coherent FSK and the XR-2211 which watches for phase shift and snaps from one state to the other when it sees it. The transmitter and receiver circuits have to be doing their stuff for all this to work. Jim and I have experienced what happens if they aren't. Most obviously, if the 2200 Hz tone causes a significant drop in recovered signal at the receiver because of transmitter over deviation, it just doesn't work. Let the deviation creep up to 7 KHz and the 2200 hz tone has significant sidebands out to 22 KHz. At the receiver, perceived signal strength is less because of IF trimming of four significant sidebands containing part of the transmitted energy (the 8.8 and 11 KHz ones).

Pre-emphasis is largely misunderstood by radio operators and the GLB documentation procreates this misunderstanding. Pre-emphasis is not done in FM circuits because of pecularities of the human voice. It is done because of the peculiarities of FM in the presence of AM noise interference. (See N5MS's Sept. 82 C&E article for an in-depth discussion of pre- and de-emphasis.) FM can easily overwhelm lower frequency AM noise components but has difficulty with higher frequency noise components. The solution is to boost frequency modulation of higher audio frequencies. GLB recommends adding a de-emphasis circuit to the audio before sending it to the microphone circuit and suggests a 1 ms time constant. Normally, a 75 microsecond time constant is used for pre and de-emphasis but in this case, the recommended circuit is a good idea, even if for the wrong reasons. It simply stifles over deviation by the high tone.

Another problem KB5XN and I are experiencing in this area is due to the peculiar characteristics of a phase modulated rig. We are having a Devil of a time getting IC-230's to transmit properly deviated tones that 'sound' loud enough. At this point, I suspect it is because those rigs are Phase modulated. Phase modulation characteristically FMs a signal more at higher frequencies. We are experiencing 3 to 6 dB stronger high frequency components from these rigs than from any others we have tried (IC-2AT, IC-22S and Kenwood TS-700, all FM rigs).

Only time well tell what it will take to get the IC-230 to work properly but we are on the track using ideas from the GLB literature. I wired up a variation of their circuit to attach the GL3 TNC to the IC-2AT. Their circuit would have knocked the audio down to about zero so I left out a one Meg series resistor and used the circuit in Figure 1.

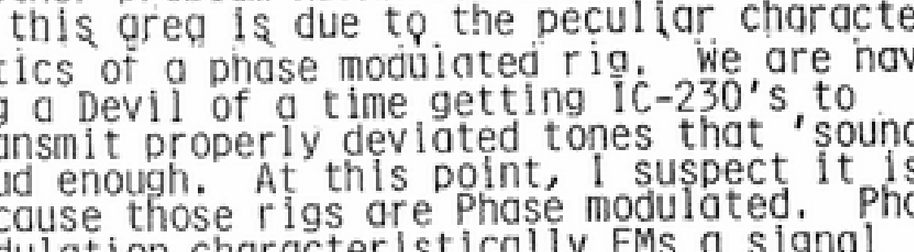

Figure 1. GLB TNC to IC-2AT Connection

The IC-2AT has a nifty Push to Talk circuit that is overlooked by most interconnectors. All it takes is a little leak between the mike

audio circuit and ground to key the rig. The 20k resistor provides that leak when the keying line goes low. The 100K resistor and .01 UF capacitor are GLB's idea. It took off and ran with the first transmission. Figure 2 shows the connection between the TAPR TNC and the IC-2AT. It also took off and ran with the first transmission.

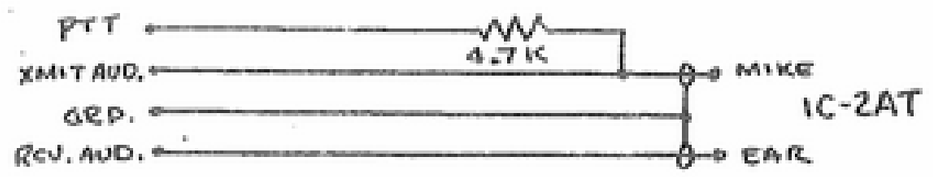

Figure 2. TAPR TNC to IC-2AT Connection

Connections between the TAPR TNC and the IC-22S and TS-700 were made without any additional components. The TS-700 keying line draws 170 mA and the IC-22S draws 62 mA so neither one can be keyed directly with the GLB TNC without a buffer. I think I already mentioned that the IC-230 draws 100 mA so it also would require a buffer if used with the GLB.

One additional connection available on the GLB TNC is worthy of mention. It has provisions for monitoring channel activity by checking the receiver squelch circuit. On a frequency used for voice, this feature will prevent a TNC from erupting with a blast of noise when someone is talking. This feature is unnecessary on a data channel because presence of other TNC's tones prevent crashes. For the most part, I doubt this feature will be of much use because I don't intend to leave the thing unattended on a popular voice frequency anyway and will be available to supervise it's operation.

The GLB TNC lacks any visual indicators that tell what or how well it is doing while the TAPR unit has more LED (light emitting diode) indicators than it knows what to do with. It actually has a spare that can be wired as the user chooses. There are indicators for carrier detect, transmit data, keying line, reset, CW ID, two for the receive audio (one for each polarity of the waveform!), and the spare (and associated driver). The one I miss most on the GLB is the carrier detect and I will probably add one to my board. The XR-2211, used as the receive signal detector, has two open collector outputs that are activated by its lock detection circuit, one a complement of the other. The GLB uses one of these outputs but does not appear to have anything connected to the other. I plan to wire the circuit in Figure 3 to this output to enable me to get an idea if the receive audio level is satisfactory.

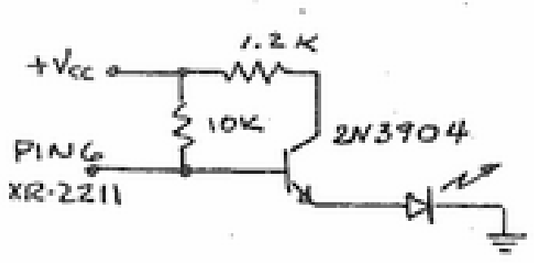

Figure 3. Carrier detector Mod to GLB TNC

Both TNCs are rich with operator messages. Those from the GLB are rather terse, but with some experience will be perfectly adequate. During a QSO it responds with numbers 1 through 6 indicating link state is: 1. Disconnected, 2. Connection established, 3. No acknowledge received, 4. All data in buffer acknowledged, 5. Other station has sent a wait request, and 6. Other station has acknowledged your wait request.

Upon demand for status, the GLB will respond with a line of information containing your VADCG address (a peculiarity of that protocol), your call sign, call sign of the last station connected with, and a string of characters and numbers indicating a whole list of status things (statii?). With a little experience, this will work quite well. For example, early in the power-up example it will show a status of "255 K5JB KB5XN $ LDUGCE". This means it has the default VADCG address of nothing, it is K5JB's TNC and will connect with KB5XN, it is disconnected, automatic linefeed mode is enabled, non-info data display is enabled, status update mode is enabled, Garbage mode is enabled, Carrier back off is enabled, and terminal echo is enabled. If there had been anything in the transmit buffer, a double quote sign would have been appended to the string.

The TAPR TNC contains ability to give all this information but does it differently. It responds with a plain language message when anything changes. (It should, it has four times as large an operating system.) To check on status of a particular thing the operator types a key word, optionally abbreviated to three letters or less, relating to the parameter being checked. From the command mode, he types "IDT" or "IDTEXT" to see what text, if any, will be transmitted in CW instead of the station call sign. I had some fun with this on Christmas Eve by typing "IDT MERRY CHRISTMAS DE WA5JGU ES K5JB" and then typing "I" to get it to send the greeting in CW. I put Charlie's call in there so at least someone else on 2-M would recognize a CW ID.

If a complete status report is needed, or one can't remember syntax of a command, he can type "DISPLAY" or "DISP" followed by an optional class code. If the class code is skipped, the whole list of 63 parameters is displayed. Using the class code reduces the information to digestable portions. For example the command to display ID parameters results in:

```
cmd:DISP I
BEACON  EVERY 0
BTEXT   TAPR/AMSAT AX.25 level 2
protocol software version 3.0
CWID     ON
IDTEXT  MERRY CHRISTMAS DE K5JB
MYCALL  K5JB
MYVADR   $01
UNPROTO  HOWDY
```

The command to display link state results in:

```
cmd:DISP L
AX25     = ON
CONMODE CONVERS
CONOK    ON
CR       ON
DIGIPEAT ON
FULLDUP  OFF
HBAUD    1200
LFADD    OFF
MAXFRAME 4
PACLEN   128
RETRY    10
TRACE    $1000
VDIGIPEA OFF
VRPT     OFF
XMITOK   ON
```

And so forth and so on...

Well, what's the conclusion? It is a little early to tell yet but I think the TAPR board is the real Cadallac, while the GLB appears to be a Chevrolet. Since the GLB runs on a single voltage power supply of 11 to 14 volts, it is a natural for carrying around for show and tell and portible demonstrations. I regret that the GLB won't operate in repeat mode because that is a nifty way to demonstrate or test the concept, connecting with one's self through another TNC.

There are still deposits in Tucson for three more TNC's and I wish they would hurry and get here. If anyone is planning on getting the GLB TNC (or already has one on order) I will be glad to switch the TAPR unit over to VADCG protocol to give them someone to talk to.

Joe, K5JB

HAM HAPPENINGS REFER TO CLUB SECTION FOR SPECIFICS

SUNDAY	MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY	SATURDAY
HAPPY NEW YEAR 1	2	MORI Great Plains 3	ARDMORE 4	EDMOND Club 5	Aeronautical Center ARC 6	COCO 7
Wheatstraw 8	9	76'ers SHAWNEE 10	11	ALTUS AREA 12	13	SCARS 14
15	A.R.E.S. 16	AUTOPATCH KAY County 17	18	19	20	VHF Club EARS 21
22	CIMARRON EDIT COLLECTOR - EMITTER 23	CORA SHAWNEE 24	25	26	27	28
29	30	31				

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