



HAM HUM

Published by
AK-SAR-BEN AMATEUR RADIO CLUB, INC.
Post Office Box 291 — Downtown Station
Omaha, Nebraska 68101



Vol. XXVII
No. 7

July 1977

NEXT MEETING

WHEN: FRIDAY, JULY 8, 1977

TIME: 7:30 P.M.

WHERE: C.W.A. LOCAL 7400
1920 South 44th Street
Omaha, Nebraska

PROGRAM: Electronic journalism for the broadcast industry took a step forward with the development of a portable camera system that was easy to carry about.

Wayne L. Goetz, WBØHEU, and Albert H. (Al) Maller, WØDCQ, from WOWT Channel 6 will present the 'Action Cam' system giving an overview of how it works to bring live television coverage to your home.

de WBØQGV

* * *

VISITORS WELCOME — REFRESHMENTS — EYEBALL QSOs

HAM HUM is the official organ of the Ak-Sar-Ben Amateur Radio Club, Inc., of Omaha, Nebraska, mailed monthly to all members and to others upon request.

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Annual Dues:

Regular member	\$7.50
Regular member and XYL	9.00
Student member	3.50

(due and payable each Jan. 1)

THAT EXTRA EFFORT

An extensive effort by your Zero QSL Bureau to get more cards distributed is in progress. To date, 375 radiograms have been initiated informing fellow hams of incoming DX cards waiting to be claimed. Art Gaeth, WØFQB, has been sending radiogram notices to hams who should claim their cards. To claim your cards all you need is a 5x7 S A S E on file with the Bureau. It seems a shame when a QSL card comes several thousand miles and is handled by many volunteers it winds up having to be destroyed (after one year) because the recipient has failed to provide an envelope to the Bureau. Information concerning the incoming DX QSL Bureaus is published in alternate issues of QST. At the time of this writing it is a bit early to completely evaluate the results of this extra effort on behalf of ART and your volunteer sorters but early returns indicate success is just around the corner. Our

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 Phone HOME: 556-1538
 BUSINESS: 397-3000 - EX 3761

Deadline for August issue is July 22nd

New member initiation fee	\$1.00
Quarterly for balance of year:		
Regular member	\$2.00
Regular member and XYL	2.45
Student member	1.00

sincere thanks to the many fine hams who responded, and to Art and the Bureau sorters for their time and effort.

ZERO QSL BUREAU
 Dick Eilers, WØYZV,
 Coordinator

SATURDAY MORNING BREAKFAST de WBØMNK

The location of the Saturday morning breakfast has been changed to the Kohll's Drug Store in the shopping plaza, 74th and Pacific. Regretfully, the location was changed a day after closing date for last month's Ham Hum so if you showed up at the Hinky Dinky Restaurant, no one was there. The breakfast is strictly an informal event with usually just a small group of 8 or 10 attending. Come any time between 10:00 - 12:00 and feel free to leave at any time you want and order anything you want.

THE PREZ SEZ

Once again a very fine June program for our members by Larry Martin of Custom Crystals, Inc. Comments this past week have been very good about the program Larry presented to us. And once again, an outstanding attendance by you, the members. Our program for July on Action Cam should also be a good one.

Plans and work are moving very well toward the completion of the station at the Jewish Community Center; I would like to thank all members who have been engaged in this project. We are going to need additional help both for the construction of the elevating mechanism for the beams and in the shack itself. So if you have that hidden talent we may be looking for, please step forward and donate a couple of hours toward the project.

The new Club Application for Membership which will be computerized should be printed very shortly and we will hand them out to all members to be completed. Thanks to Jim, WBØQGV (who stays up till 5 A.M. chasing DX) for all his efforts in getting the application ready to print. I do not understand much about the computer language but I guess it all means something to Jim. Just to watch him ponder (and pull hair) while working on the app makes me wonder if I want to learn more about computers or not.

I am sure we are all sorry to hear at Joe, KØKES, will have to give up his job with the QSL department. I think that he and all the men and gals who have undertaken this project have done a very splendid job so thanks, Joe, from all of us.

July 1977

We are now at the halfway point for this year and it has been a very rewarding year for the Ak-Sar-Ben Amateur Radio Club. We have accomplished many things and have had a record number of new amateurs licensed due to the efforts of the Education Committee. It looks like the fall classes which will begin in October will be full also. Along this same line, we will again this year have a booth at the annual CB Jamboree, to be held at Peony Park in July. If you would like to help out, please contact Chuck, WBØNVL. The PR Committee has been working very hard to get good material together for this event and we hope to get a nice-sized group of students again this year from the Jamboree. So lend a hand!

And last but not least, the Repeater Committee is in high gear getting ready for the arrival of our new repeater and duplexer. This will make a welcome addition to the overall emergency communications network here in the county.

73s,

CU and Action Cam at the meeting.
Bob, WBØLYU

RECENT CONTRIBUTORS

Repeater 34/94

Loren F. Chase, WBØQYK
Lowell W. Jackson, WAØHKT
Leo I. Meyerson, WØGFQ
Paul A. Wolfmeyer, WAØWYG

Repeater 40/00

Loren F. Chase, WBØQYK
Paul A. Wolfmeyer, WAØWYG

Thanks to each of you!

JUNE 14, 1977 BOARD OF TRUSTEES MEETING

President Conley announced that a new 6 element, 6 meter beam has been purchased with insurance claim funds to replace the old antenna destroyed last year.

The Board authorized the Repeater Committee to purchase the necessary mounting hardware to install the new Phelps Dodge Comprod antenna on the W0WT tower. It was announced that the Spectrum Communications repeater which has been donated to the Club anonymously is expected to be delivered in the next 8 weeks. A 100 db Sinclair Products duplexer has been ordered, as per a motion that was passed at the May general membership meeting. The delivery date of the duplexer is unknown at this time.

The monthly Treasurer's report was read and approved.

The Board authorized the allocation of an expense money fund for the Education and the Public Relations committees. Both groups are now authorized the expenditure of up to \$100.00 without prior Board approval. Accounting will be made through the Treasurer at the first Board meeting following any disbursements.

A consensus of opinion was reached that the Public Relations committee will handle the booth at the CB Jamboree this year. Club members who wish to participate in this second annual project should contact Chuck Hoffman, W0NVL.

President Conley announced that the dates for the fall Code and Theory classes were now firm. Classes will start the first Monday in October and will be held on Monday and Thursday

evenings at the Jewish Community Center, 132nd and Pacific Streets.

Bob also announced that starting with the October general membership meeting, the meetings will be held on the second Tuesdays. This was voted upon at the April meeting, and a switch in nights was necessary to accept the generous offer from the Jewish Community Center to provide the Club with a permanent home for our meetings.

Board member LeRoy Hilt, W0MSN, informed the Board he would be leaving our fair city for a new home in Las Vegas, Nevada. His resignation was reluctantly accepted and we wish him well. We hope that Las Vegas is a little more forgiving about tower construction than Omaha was. (That's an inside joke, folks.)

As per the Club Bylaws, it is the duty of the Board to select a successor from the membership and which successor shall be approved at the next regular meeting of the membership by a majority vote of members in attendance at such meeting. Joe Nanos, K0KES, was selected by the Board to fill the unexpired term of LeRoy Hilt, W0MSN.

Thomas Thiessen, K0PQR
Club Secretary

SILENT KEY

Royal M. Enders, K0LYO
Haven House
1540 North 72nd Street
May 27, 1977

Our deepest sympathy to his XYL Marie and family.

ADDITIONS TO ROSTER

Behrens, Warren M., Jr. WDØCBL
 1424 South 136th Street
 Omaha, Nebraska 68144
 Phone: 333-1204

Brenneman, Robert H. WØUQJ
 953 Oak Park Road
 Council Bluffs, Iowa 51501
 Phone: 323-1390

Brunt, Kim R. WDØCSM
 7730 North 39th Street
 Omaha, Nebraska 68112
 Phone: 455-2415

Burgess, Garde H. WDØCSN
 5723 South 31st Street
 Omaha, Nebraska 68107
 Phone: 733-5811

Curry, Herbert D. WØQXR/WBØEDB
 9836 Seward Street
 Omaha, Nebraska 68114
 Phone: 397-7415

Grillot, Dennis J. WDØADG
 PSC # 1, Box # 958
 Offutt AFB, Nebraska 68113
 Phone: 294-2369

Holmes, David C. WBØWXS
 2150 South 33rd Street
 Omaha, Nebraska 68105
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Horne, Gerald S. (Steve) WDØAGG
 PSC #1, Box #517
 Barracks 49H, Room 204
 Offutt AFB, Nebraska 68113
 Phone: 294-2049

Huss, Stephen J. WBØZCR
 2636 Monroe Street
 Omaha, Nebraska 68107
 Phone: 734-4244

Lindsley, Terry D. KØSZS
 7302 Webster Street
 Omaha, Nebraska 68114
 Phone: 391-3364

McAdams, Lee Roy WB7RUA
 P. O. Box 206
 LaGrange, Wyoming 82221
 Phone: (307) 834-2265

Perkins, J. E. (Jerry) WBØVUR
 216 Fairchild Circle
 Offutt AFB, Nebraska 68113
 Phone: 292-5060

Washa, Robert R. WBØYRD
 14042 Woolworth Circle
 Omaha, Nebraska 68144
 Phone: 333-8258

Willard, Thomas V. WBØZIB
 3306 Gertrude Street
 Omaha, Nebraska 68147
 Phone: 734-2844

MEMBER NEWS

Dear Fellow Members:

I have arrived here in Garland, Texas, and find the place filled with repeaters on two meters and 6 meters.

I think it will be hard to chose a club to join as there are about a dozen clubs located in the Dallas area. None will be as fine as the Ak-Sar-Ben Club in Omaha. Have never found a better bunch of guys. I appreciate all the help that I have received from them in the 3 years I lived in Omaha.

Note: Send my name tag that I ordered to my new address.

Russell Crenshaw (soon to be X-WØYWD - must change to a 5 call now).

3633 Hillsdale Lane
 Garland, Texas 75042

IVAN, WHERE ARE YOU?

The June issue of "73 Magazine" ran an article on page 108 about the computation of beam headings on a micro-processor. A fortran program listing was included.

After an initial test of the program as it was published, modifications were made in the input and output areas in order to generate a table of azimuths to have on hand in the shack, rather than running them one at a time. Also,

for those without a micro in their shack, the table should be a help in hunting DX.

The azimuths are based on North using a clockwise rotation, similar to the meter faces for many rotators. South latitudes and West longitudes are entered as negative numbers; while the parts of degrees are in decimal form.

The table follows:

AZIMUTHS AND DISTANCES FROM OMAHA, NEBRASKA USA LATITUDE LONGITUDE 41.3 -96.0								
QTH	COORDINATES		BEARINGS		DISTANCES			
LOCATION	LAT.	LONG.	YEARS	MIS	STAT.	NAUT.	KILOH.	NOTES.....
MINN-ST. PAUL MN	44.9	-93.0	29.	211.	287.	251.	465.	
MILWAUKEE WI	43.0	-87.9	71.	256.	430.	373.	694.	
CHICAGO	41.5	-87.6	85.	271.	434.	377.	699.	
DETROIT MI	42.3	-83.1	79.	268.	663.	576.	1067.	
NEW YORK	40.8	-74.0	84.	279.	1142.	993.	1839.	
BUFFALO NY	42.9	-78.8	77.	268.	863.	767.	1421.	
BANGOR ME	44.7	-68.7	70.	269.	1387.	1205.	2233.	
BOSTON MA	42.2	-71.1	78.	275.	1278.	1110.	2056.	
WASHINGTON DC	38.8	-77.0	93.	285.	1016.	883.	1635.	
HALEIGH NC	35.7	-78.6	106.	297.	1010.	878.	1626.	
CINCINNATI OH	39.1	-84.5	100.	287.	624.	542.	1004.	
INDIANAPOLIS IN	39.7	-86.1	98.	285.	528.	459.	850.	
PITTSBURGH PA	40.4	-80.0	88.	279.	835.	726.	1344.	
DES MOINES IA	41.5	-93.6	81.	262.	124.	108.	200.	
WICHITA KS	37.7	-97.3	196.	15.	260.	226.	419.	
ST LOUIS MO	38.6	-90.2	119.	303.	355.	309.	572.	
NASHVILLE TN	36.1	-86.8	122.	308.	609.	529.	981.	
CHARLESTON SC	32.7	-79.9	118.	308.	1061.	922.	1707.	
ATLANTA GA	33.7	-84.3	125.	312.	822.	714.	1323.	
MIAMI FL	25.7	-80.1	135.	323.	1404.	1220.	2260.	
BIRMINGHAM AL	33.5	-86.8	134.	319.	737.	640.	1186.	
JACKSON MS	32.2	-90.1	150.	334.	702.	610.	1130.	
LITTLE ROCK AR	34.7	-92.2	154.	337.	508.	435.	805.	
NEW ORLEANS LA	30.0	-90.0	155.	338.	849.	737.	1366.	
KANSAS CITY MO	39.0	-94.5	153.	334.	172.	149.	277.	
HOUSTON TX	29.7	-85.3	139.	326.	996.	865.	1602.	
OKLAHOMA CITY OK	35.4	-97.5	192.	11.	414.	360.	666.	
ALBUQUERQUE NM	35.0	-106.6	236.	50.	720.	626.	1160.	
PHOENIX AZ	33.5	-112.0	243.	53.	1028.	893.	1654.	
DENVER CO	39.7	-104.9	259.	73.	483.	420.	778.	
RAPID CITY SD	44.1	-103.2	299.	115.	413.	359.	665.	
FARGO ND	46.8	-96.8	354.	173.	385.	334.	620.	
BILLINGS MT	45.7	-108.4	300.	111.	695.	604.	1118.	
CASPER WY	42.8	-106.3	284.	97.	537.	467.	865.	
BOISE ID	43.7	-116.5	285.	91.	1053.	915.	1695.	
SALT LAKE CITY UT	40.7	-111.8	272.	82.	826.	717.	1329.	

AZIMUTHS AND DISTANCES
FROM
OMAHA, NEBRASKA USA
LATITUDE LONGITUDE
41.3 -96.0

QTH LOCATION	COORDINATES		BEARINGS		DISTANCES			NOTES.....
	LAT.	LONG.	YOURS	HIS	STAT.	NAUT.	KILOM.	
PORTLAND OR	45.5	-123.6	291.	91.	1410.	1225.	2270.	
SEATTLE WA	47.6	-122.3	297.	98.	1360.	1131.	2188.	
LAS VEGAS NV	36.2	-115.1	257.	65.	1088.	945.	1751.	
SAN FRANCISCO CA	37.7	-122.4	268.	71.	1423.	1236.	2290.	
LOS ANGELES	34.0	-118.2	254.	60.	1412.	1140.	2112.	
LA PAZ	-16.5	-68.0	149.	356.	4374.	3801.	7040.	
BOGOTA	4.6	-74.1	145.	355.	2869.	2473.	4618.	
RIO DE JANEIRO	-22.4	-42.7	131.	322.	5567.	4858.	8960.	
GOOSE BAY	53.3	-60.5	50.	257.	1828.	1589.	2943.	
STOCKHOLM	59.3	18.0	30.	311.	4551.	3957.	7291.	
MOSCOW	55.7	37.6	24.	325.	5197.	4515.	8363.	
LONDON	51.5	-0.1	44.	302.	4283.	3722.	6893.	
MUNICH	48.1	11.5	42.	310.	4840.	4205.	7784.	
PARIS	48.8	2.3	46.	304.	4474.	3888.	7201.	
ROME	41.8	12.6	46.	312.	5164.	4487.	8311.	
BOMBAY	18.9	75.8	8.	352.	8232.	7153.	13248.	
CALCUTTA	23.6	88.4	355.	183.	7936.	6896.	12772.	
CANTON	23.1	113.3	331.	203.	7600.	6604.	12231.	
TOKYO	35.6	139.7	317.	218.	6049.	5256.	9734.	
FIJI	-18.8	170.0	255.	220.	7014.	6094.	11287.	
PERTH	-32.0	115.9	279.	240.	10561.	9176.	16995.	
CAPE TOWN	-33.8	18.4	104.	298.	8889.	7724.	14305.	
ANCHORAGE	61.2	-149.8	320.	96.	2595.	2255.	4177.	
CALGARY	51.0	-114.0	314.	120.	1089.	946.	1753.	
MONTREAL	45.5	-73.5	68.	263.	1156.	1004.	1861.	
CHRISTCHURCH	-43.5	172.6	235.	238.	8139.	7072.	13098.	
DARWIN	-12.4	131.0	291.	225.	6973.	7797.	14440.	
PITCAIRN	-24.5	-133.0	214.	28.	5125.	4453.	8247.	
TAHITI	-17.5	-149.5	231.	58.	5306.	4611.	8540.	
HONOLULU	21.3	157.8	296.	226.	6036.	5244.	9713.	
MANILA	14.6	120.7	320.	209.	7908.	6872.	12727.	

WBØQGV

**ONLY THE NAME
HAS CHANGED**

RAY-DE-O-RAY has changed name. The firm, operated by Ray Kydney, WAØWOT, is now OMAHA AMATEUR CENTER. In reporting the change, Ray calls our attention to the fact nothing else has changed - same address, same phone number, same hours, and the same Ray Kydney. See page 10. Ray will probably continue the name Ray-De-O-Ray for sales of CB and business frequency gear.

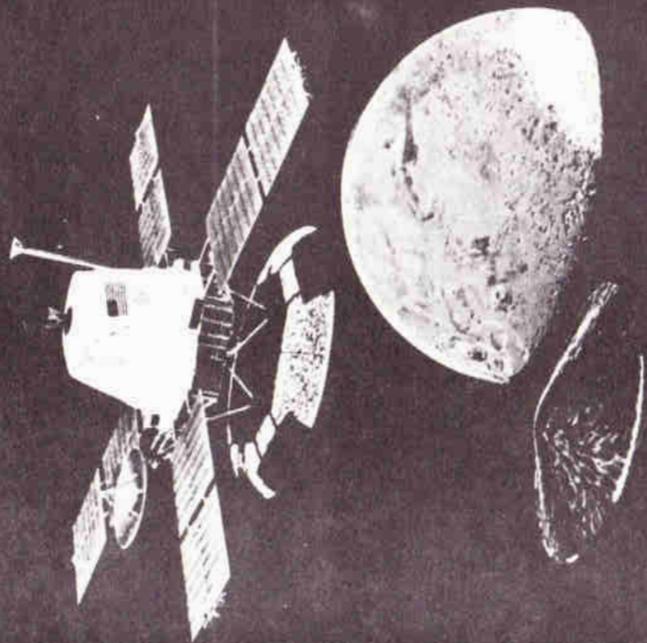
**IT HAPPENED IN
JULY**

July 9, 1847—New Hampshire passed a law establishing ten hours actual labor as the standard work day.

July 17, 1861—Congress authorized issuance of first paper money by the U. S. government.

July 23, 1829—William Austin Burt patented the first typewriter.

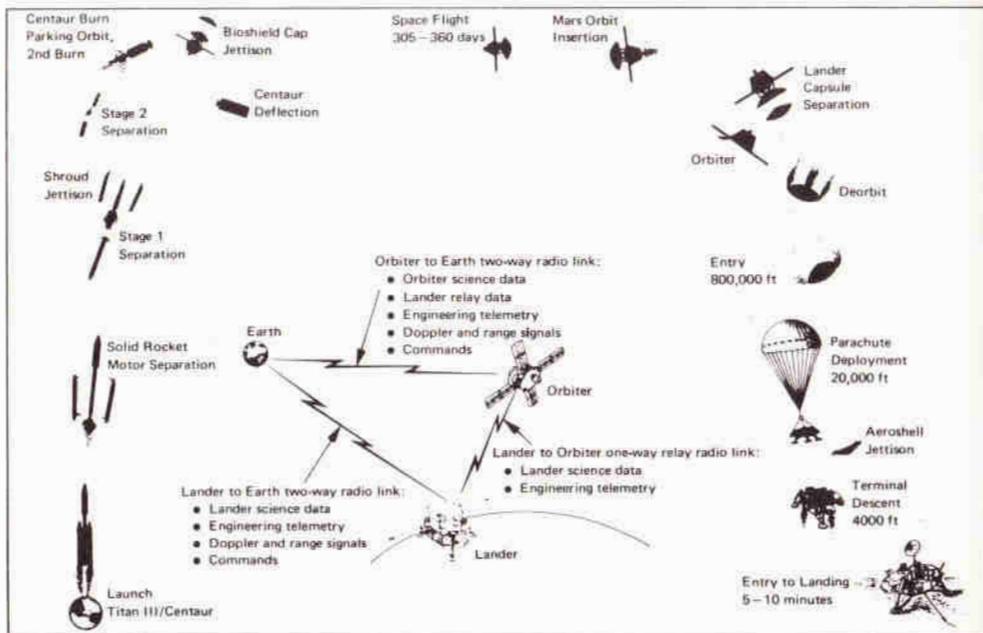
N6V



Commemorating the Viking Mission



Jet Propulsion Laboratory
AMATEUR RADIO CLUB



VIKING - Mission to Mars

The Viking Project comprises two missions designed to orbit and soft-land spacecraft on the surface of Mars. Each spacecraft consists of an orbiter carrying a sterilized capsule to be landed by parachute and braking rockets. The spacecraft were launched by Titan/Centaur vehicles on August 20 and September 9, 1975.

The Viking missions will make direct measurements in the atmosphere and on the surface of Mars, and make observations of the planet during approach and from orbit. Particular emphasis is being placed on obtaining data concerning biological, chemical and environmental factors that may indicate the past, present, or potential existence of some form of life on the planet.

The NASA Langley Research Center has overall management responsibility for the Viking Project. The Lander System was developed by the Martin Marietta Corporation and the Launch Vehicle was the responsibility of the NASA Lewis Research Center. JPL's assignment was the development of the Orbiter System, the Tracking and Data Acquisition System and the Mission Control & Computing Center System.

Viking 1 will arrive at Mars on June 19, 1976 and is scheduled to land in mid July. Viking 2 will arrive on August 7, 1976, with touchdown set for mid September.

MARTIN MARIETTA

DENVER DIVISION
POST OFFICE BOX 179
DENVER, COLORADO 80201

N6V

JPL AMATEUR RADIO CLUB
JET PROPULSION LABORATORY
4800 Oak Grove Drive
Pasadena, California 91103

QSL VIA W6VIO

CALL	DATE	GMT
WBØ Q6V	9-4-76	0609

RST	MHz	2-WAY
59	7.3	SSB

73

PSE

QSL

TNX *AT*

INTERESTING QSL CARD DEPARTMENT

Jim Peterson, WBØQGV, sent in his PROJECT VIKING-MISSION TO MARS cards. He has one for 3.8, 7.3 and 14.232 MHz. Black and white does not do them justice as the upper part shown above is in full color. Maybe Jim will bring one to a Club meeting. Not too many of us have a QSL card with a single letter prefix and a single letter suffix.

LADIES ONLY

First of all, what a tremendous meeting we had last month — and didn't Larry Martin do a great job on the program? It sure was nice to see so many of you Gals attending the last meeting and for those of you who are not attending, you are missing out on a great deal of education and enjoyment. What I like about the meetings is "BANG" they start on TIME! And move right along at a fast, exciting clip! I LOVE 'EM!

Some Random Thoughts: — I often look back to when my father built the first radio sets in the State of Wyoming. The neighbors and his

friends would come over in the evenings to either just watch or help. I was thrilled when he let me wind coils with him. Now I wish I had stayed in radio at that time. I had to wait 100 years to get back with it! Hi Hi! I know that most of you Gals can remember similar experiences! FIRE THEM IN — LET'S HEAR ABOUT THEM! Along with that Gals, also send me your thoughts and ideas of what you like most about AMATEUR RADIO. For instance, every Amateur enjoys receiving QSL Cards (proof of contact — card to card) and there never seems to be two cards alike,

OMAHA AMATEUR CENTER

(Division of Ray-De-O-Ray)

DENTRON ICOM HY-GAIN CUSHCRAFT

NYE VIKING BIRD ATLAS NEW-TRONICS YAESU

Used Gear We Take Trade-ins

More brands as they become available

5347 North 30th Street 453-3344
Ray Kydney, WAØWOT

HOURS: Monday — 10:00 AM — 7:00 PM
Tuesday thru Friday — 10:00 AM — 5:30 PM
Saturday — 10:00 AM — 4:30 PM

BOOK REVIEW — "BIG EAR"

By John Kraus, W8JK

which certainly adds to the attractiveness of MAIL CALL! At the same time tho, I also enjoy many of the beautiful envelopes that accompany the cards and in most cases treasure and save them also. This is what makes Amateur Radio LOVABLE — there are so many fine aspects!

At the same time AMATEUR RADIO needs your HELP! The opportunities for Women in every field of endeavor are becoming more and more evident in every way. AMATEUR RADIO is no exception! Our fine AK-SAR-BEN AMATEUR RADIO CLUB, INC., is no exception. Along with these fine opportunities come responsibilities. At our local level we need more DOERS AND HELPERS!

With the great promotions and programs our fine President and Board Members have set up for the months ahead, they need a LOT OF HELP, i.e., telephone operators, Amateur Radio Emergency Corps, typists, instructors in theory and code, Red Cross, etc., etc., all relative to AMATEUR RADIO.

You all have the ability (women are so pleasing to work with), knowledge, initiative, willingness and integrity — SO — BE A VOLUNTEER. Most Club Officers dislike asking for help all of the time — but LOVE TO BE ASKED. Help is especially needed from you young Gals; you have many years ahead of you and you should start getting your experience now — O.K. GALS.

We're all counting on you!! BE A WINNER — BE A VOLUNTEER!

88's

Irene, WBØMPC

Your Editor has just finished reading the Big Ear and it is just as advertised — "fascinating," "Spell-binding," and "Enchanting." It is an adventure story of the exploration of the universe and search for other life than on Earth. The book will give you the impression of the vastness of the universe so that it "boggles" the mind. A story of pulsars, quasars, and black holes, all of which were located on the large astronomical radio antenna located near Delaware, Ohio.

To the old timers it will be interesting to relive the early days with W8JK from the Galena detector, the house-to-house telegraph, electrolytic jars, and quartz crystal grinding. Later, John developed many styles of the Helical Antenna with experiments on the ultra-high frequencies. (Not given in the book — but in the '50s W8JK gave a talk to DARA on his antennas with the provision that we make an experimental Helix for 10 meters. This was accomplished by W8NSS (Light-cap) but the monster made of downspout was rather unwieldy and did not prove useful at these frequencies. But it was tried!)

John Kraus was the designer of the "Big Ear" and a pioneer of radio astronomy, while teaching at Ohio State University as Professor of Radio Astronomy and Physics. With the antenna and the many persons who made measurements, a great many maps of the radio emissions of outer space were made. They discovered thousands of previously unknown radio sources. The book finishes with the possibilities of picking up

intelligent transmissions from outer space and the difficulties involved, since most of the radio emissions were transmitted many light years ago. Therefore, immediate communication cannot be established. As a Radio Amateur, the book will surely get you to thinking about the future of our universe, and what we might contribute in our experiments.

The book is available from Cygnas-Quaser (CQ) Books, P.O. Box 85, Powell, Ohio 43065 for \$3.25 paperbound or for \$6.25 hardbound, both postpaid.

de RF Carrier, DARA, Ohio

BROADWAY TWO-WAY RADIO

3420 West Broadway
Council Bluffs, Iowa
Phone: 328-3391

MIDLAND HY-GAIN

HY-GAIN ANTENNAS

Amateur products sold
only to licensed amateurs.

C. Porter Rinn, WBØOGA

THE TEN CARMANDMENTS

1—I shall not exceed safety speed limits or violate speed laws.

2—I shall not drive after drinking

3—I shall not pass on curves, hills where the view is obstructed.

4—I shall not drive if drowsy or fatigued.

5—I shall dim my lights when other cars approach at night.

6—I shall observe and obey highway signs—the signs of life.

7—I shall slow down at schools, playgrounds, hospitals and other danger zones.

8—I shall be cautious at all intersections.

9—I shall slow down at sundown and whenever road conditions are unsafe.

10—I shall be courteous and respect the rights of every driver and pedestrian.

—Service

A true friend is one who thinks you're a good egg even when you're busted.

—Service

Quote:

"This country is composed of two kinds of people. One group believes that the government can support the citizens. The other wonders whether all the citizens can support the government."

—James A. Farley

SOME MYTHS AND TRUTHS ABOUT HIGH POWER MOBILE OPERATION ON TWO METER FM

By Richard G. Fenner, W5AVI, in HARC NEWS
(Houston Amateur Radio Club)

In the past few years many manufacturers have come out with high power amplifiers which can provide outputs up to two hundred watts for five to ten watts of input. The use of these amplifiers when talking through repeaters and on repeater frequencies has provoked much controversy and heated discussion here in the Houston area. The purpose of this article is to explain how these amplifiers may be used properly and to expose some myths about their use.

One basic truth is that an amplifier will extend the range over which you can talk into a repeater. Most repeaters in the Houston area provide a mobile to repeater coverage range of twenty-five to forty-five miles with 99% reliability. This 99% reliability range is determined by the so-called radio line-of-sight. Radio line-of-sight is slightly longer than optical line-of-sight due to the tendency of radio waves to follow the curved path slightly bent downward toward the earth. Reference No. 1 contains nomographs which show what this distance is for any combination of mobile and repeater antenna height.

Beyond the 99% reliability, point range can be extended by increasing transmitter power, increasing antenna gain, or increasing antenna height. This is the range at which the high power amplifier should be used. Using the amplifier at ranges closer to the repeater will only cause problems which will be addressed later. Dollar July 1977

for dollar, the best expenditure of money would be for a better antenna system. One that provides more gain or has greater height is best.

A basic myth about high power mobile operation is that if a transmitter is free of spurious signals and harmonics it will not bother anything. If intermodulation were not a fact of life, this might be true.

Consider the fact that within a ten mile radius of Bellaire there are four repeaters operating in the 146 MHz to 147 MHz range. Using the familiar intermodulation of:

F intermodulation = $2(\text{Freq A}) - \text{Freq B}$

We find that a high power mobile operating on a repeater input frequency of 146.28 MHz (Freq A) can mix with another mobile signal on 146.34 MHz (Freq B) in the RF or mixer stages of a repeater receiver set at 146.22 MHz, thus keying up the repeater. Remember that selectivity in receivers is provided in the IF sections, and not the RF stages. The receiver RF stage sees both signals, even though tuned to 146.22 MHz. From this one can see the false thinking that a clean high power signal will not cause any problems.

Another myth related to selfish motives is that high power will keep people from doubling with you, or insure that if they do, the high power signal is the one which will be heard.

Let's assume a situation where mobile A is operating a 100 Watt transmitter at 20 miles range from the repeater. Mobile B is operating a ten

Watt transmitter five miles from the repeater. At the 146 MHz the atmospheric attenuation (path loss) between the repeater and Mobile A is minus 111 dB. (Reference 2) Between the repeater and Mobile B the path loss is minus 105 dB. Even though Mobile A has plus 10 dB of signal due to higher power, for equal antenna gain and height on both mobiles, Mobile A is still one dB weaker than Mobile B, who will capture the repeater receiver detector. The message here is that high power will not always insure that you will talk over everybody on the repeater.

Moving to another myth, let's look into the practice of operating high power mobile on repeater output frequencies. Despite many articles in past issues of radio amateur journals outlining repeater licensing rules, there is a vast misconception that repeater frequencies are assigned with a repeater license by the FCC. This is not so. Repeater license applications do not have to state the frequency of operation. The FCC only cares that two-meter repeaters are operated in the 146 MHz to 147 MHz range.

Repeater operators have to follow the same rules as any other radio amateur and try to insure that the repeater does not interfere with communications taking place on the repeater output frequency. Thus, if a high power mobile is conversing with another mobile on the repeater output frequency (called direct operation) the repeater operator is obliged to shut down the repeater to insure that a mobile who cannot hear the high power mobiles will not transmit through the repeater and cause interference.

One might ask how this can happen if one mobile is on direct and the other is using the repeater. Be assured that it has happened in the past and will again in the future. Brief direct conversations on the repeater output frequency will probably not cause a problems. However, extended direct conversations between one mobile on the repeater and one on direct can become a cause for the repeater to be turned off.

Thus it can be seen that there is a place for high power mobile operation, and when used properly such operation can be of benefit to the user. However there are many other cases where it provides marginal or no benefit to the user and can provide interference and problems for both the repeater users and operators.

Reference 1 - "Reference Data for Radio Engineers," 4th edition, 1956, Chap 24, pp. 719-742

Reference 2 - IBID, p. 752

Editor's note: I just felt that this excellent article might be of interest and value to those of us who have believed that high power will solve nearly all problems. Fortunately for us, we do not have the "congestion problem" of many repeaters; we could be causing problems for other services in our area. Besides, I feel that EVERY Amateur Radio Op wants to do the right thing as an operator and as an Amateur. de W5KR

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The Little Gazette

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