



HAM HUM

Published by
AK-SAR-BEN RADIO CLUB, INC. - Omaha 1, Nebr.
Post Office Box 291 - Downtown Station



Vol. XIV
No. 3

March 1964

March 23, 1964

Dear Editor:

It becomes quite a complicated situation when a fellow has two hobbies and tries to do justice to both of them on an equal basis. Take my case, for example, amateur radio and hot rod cars.

The other day my receiver konked out so I got the signal tracer out and went to work.

Starting with the mixer stage, the first thing to check was the choke butterfly on the carburetor to see if it was completely open. There you pump the accelerator pedal to make sure that the gas is coming out at 455 kc.

Ascertaining the above to be OK, you proceed to the oscillator tube and check its breaker points for .016 inches spacing. The oscillator is then set at 455 kc above the incoming signal with a cam dwell of 28 degrees at 1000 rpm.

Proceeding to the R.F. stage, you set the signal generator for 100 octane and check the bias of the tube so it fires at 10 degrees before 1000 rpm. If the plate and screen voltage are not up to par then replace with plugs of a colder heat range.

Next, we check the compression of the I.F. stages and find that

one of these are rather low which indicates a possible leaky valve which was corrected by a .01 ceramic condenser from screen to ground.

The output from the product detector was checked for a minimum of 45 db suppression of the unwanted side-band in the left bank of cylinders.

The first audio stage is checked for audio gain at 2000 rpm and it was discovered that at 6000 rpm, gain fell to almost unity so we went to a magneto ignition for a better signal at the higher rpm's.

Finally, the last stage of audio had sufficient gain with the throttle only two-thirds down to lay a strip of rubber on the street for fifty feet with only 10% feedback for fidelity which makes it arm chair copy in any ones shack.

Think I'll shelve the whole works and go back to stamp collecting.

This month's slogan, which is applicable to 95% of the automobile drivers in Omaha, especially those who use Dodge Street daily. "IF YOU DRINK, DON'T DRIVE LIKE YOU NORMALLY DO."

Ed - W0CQX

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



APRIL MEETING

The next meeting of the Ak-Sar-Ben Radio Club, Inc. will be held on Friday, April 10th, at the General Motors Training Center, 225 North 80th Street, Omaha, at 8:00 P.M.

TELSTAR and THE BIG BOUNCE will be the feature movies at the next meeting of the Club. These films, produced by the Bell System in color, will show you how the satellites were launched. The communication technique used to control Telstar will be described. Reflection of radio signals from Echo balloons is explained. Afterwards, we will have a discussion of the part Amateur Radio plays in exploring outerspace.

ST. JOE, MO. NET

Chuck Sudds, KØTVD and Lou Pickert, WØCCD just received their 100th seal - for working into St. Joe Mo. - Civil Disaster Net - 100 Sundays without missing.

This issue of Ham Hum is being sent to all of the Hams in the greater Omaha area. We extend an invitation to each of you to attend our April Meeting. If you have never heard of our Club, we are an association incorporated for the purpose of promoting amateur radio, and membership is open to all interested in amateur radio. Come out to the GMTC on April 10th and join in person-to-person gab fest. Guests are welcome.

Published by
AK-SAR-BEN RADIO CLUB, INC.
Post Office Box 291
Omaha 1, Nebraska
Editor: Dick Eilers, WØYZV

HOME: 391-2255
Phone BUSINESS: 342-1402 - EX.
Assoc. Editor: John Snyder, WØWRT

HOME: 556-1538
Phone BUSINESS: 551-0659 - EX. 317

MARCH MEETING

Orville Weimer, WØGKL, presented the subject of DX in a most interesting manner at our March meeting and all those present appreciated it very much. Our thanks to Orville for bringing it to us. Searching for DX on the higher frequency bands is one side of our many-sided hobby. Only a small percentage of us get down to real serious concentration on DX. Quite a number dabble in DX and quite a number without the assistance of some sun spot activity can't get out of the back yard on 6 meters, for example. But regardless of the variety of interest in DX, I think we all found it to be very interesting, particularly with Orville's presentation of it. We hope it will inspire some of the 6 meter gang to improve their license so that they can at least sample some of it. Again, our thanks to WØGKL for his interesting discussions of the problems of the DX man.

CRIPPLED CHILDRENS' DRIVE OF MARCH 15TH

On the 2 meter relay were Ed Donze, WØYEV, Harold Welch, KØSCG at the Omaha National Bank headquarters; at the other end of the 2 meter relay at the Red Cross Station was John Snyder, WØWRT; 6 meter N.C.S. was run by Ralph Erts, WØSMY; John Orr, WØPHW on the dispatching map; additional assistance from Hugh Tinley, KØGHK and John Moore, WNØGBR.

The six mobile units were: Fred Fischer and Son, Kurt, WØEGP; Louie Cutler, WØVLI; Royal Enders, KØLYO (Mobile Chairman of Club); Dick Eilers, WØYZV and rider Ernie Walters, WAØAUU; Bud Smith, WAØICK and rider Howard Rosenberg; Bob Larsen, KØKQI and rider Harry Silver, WAØDJK.

The south relay station was Grandma Lou, WØCCD. Our apologies if anyone was missed. Thanks much to all these amateur operators for your help on the drive. Hopes for getting a 10 meter base and mobile operation organized weren't successful at this time, probably due to too short notice. We noticed that two of the mobiles didn't even have riders to assist them with the writing, operating, etc., and in an organization with the membership of the Ak-Sar-Ben Radio Club, there really isn't much excuse for this. Perhaps some of you 40 or 20 meter DX hounds or 75 meter traffic men could help by going along as a rider. I don't think it will hurt anybody to see how 6 meters works - you might even get interested yourself.

NOTES FROM THE BOARD

At the Board meeting for March it was decided to sponsor a contest called "CQ Ak-Sar-Ben Contest" for the purpose of promoting local QSO's and to better acquaint local amateurs with one another. The contest will begin at midnight on April 30, 1964 and will end at midnight on August 30th, 1964.

The contest will be open to all licensed amateurs residing in Douglas County, Nebraska, except that amateurs who are members of the Ak-Sar-Ben Radio Club, Inc. may participate regardless of where they may be located.

The rules for the contest will appear in next month's issue of Ham Hum and will probably be available at the Club Meeting on April 10th.

OFFICIAL BULLETIN NR 940 FROM ARRL HEADQUARTERS NEWINGTON CONN MARCH 12 1964 TO ALL RADIO AMATEURS BT

FCC has begun issuing amateur licenses with its new electronic data processing equipment. Conversion to the new system has involved unavoidable delays in handling amateur applications the past few months, but it is expected that the backlog will be cleaned up in a few weeks. Applicants for renewal who filed before expiration date may, of course, continue to operate even beyond the expiration date. Applicants for new licenses are urged to be patient a short additional time \overline{AR}

Associate editor's remarks concerning the following article by Bill Roberts, W9HOV of Gain, Incorporated, Chicago.

As you listen in on the various ham bands, you'll very often hear remarks about one's S.W.R.; in fact this seems to be an unusually popular topic. After hearing some of the comments over the air and in person, one can come to the conclusion that there are some basic misconceptions about this subject. Many of the articles previously written on S.W.R., Antennas, Feedlines, are such esoteric gobbledegook that it requires a Ph. D. in E.E. in order to get much out of them at all; and at the other end of the spectrum, there are many articles which tend to create wrong impressions, possibly by being oversimplified. A couple of very good articles on the above subjects have appeared just recently; one of these is in the 73 Magazine of March 1964 entitled "Transmission Line Tripe and Trivia" by Albert Hankinson, W5EUL of Oklahoma City. We will now reprint another very fine article by W9HOV which appears in the March 1964 VHF'er published by Doug DeMaw, W8HHS of Comaire Electronics. *Neither* of these articles applies *only* to VHF but should be of tremendous interest to the amateur or commercial radio operator regardless which bands he works. JDS.

COAX PRUNING

or

What Happened To The SWR

By

Bill Roberts, W9HOV
Gain Incorporated
Chicago, Illinois

During these days with every one being polled on one thing or another, we dare say that if the question were asked if pruning co-ax at the shack terminal would improve the SWR or not you would run into something like this:

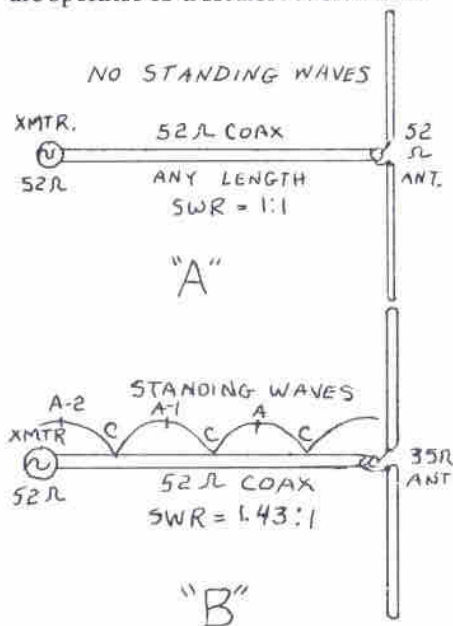
1. It can lower the SWR 1
2. It will not effect the SWR 1
3. Pruning helps 5
4. I do not know 3

Now let's analyze the answers.

1. Pruning cannot affect the SWR
2. It will NOT affect the SWR
3. Pruning can help but not by lowering the SWR
4. No comment.

To find out what we are talking about, we must first understand where the mysterious "SWR" is created. SWR or Standing Wave Ratio is developed at the point where the feedline attaches to the antenna and NO other place. If the impedance of the antenna should be 70 ohms and the nominal impedance of the line is 52 ohms we immediately set up a ratio of 70 to 52 or an SWR of 1.346 to 1. This also works in the same manner when the antenna impedance is less than the line. For instance a 35 ohm antenna fed to a 52 ohm line would give a 1.486 to 1. Now it is apparently obvious that "paring" the coax line at the transmitter end cannot possibly improve or harm the SWR figure as that is a component of the antenna-feed line match. (Although it can disguise the condition and improve transmitter loading. ed.) Actually the feed line can be cut, and give improved results

but NOT because the SWR has been effected in any way. Let's look at the two simple charts below – the first where a 52 ohm antenna is fed to a 52 ohm line, with that much sought after SWR of 1 to 1. Then add on to the second chart, where the operator is a bit more unfortunate.



First we must understand that the mismatch causing the SWR at the antenna is reflected down the line. In diagram A – there is no reflected impedance change because all things are equal. Therefore when the impedance of the antenna equals the impedance of the line – the feed line can be one inch or one mile long and the impedance at the transmitter end, will remain constant. In diagram B we have the reverse. The antenna impedance does not match that of the line. That means that although the nominal impedance of the coax as stated by the manufacturer is 52 ohms, the impedance

up and down the line is not the same. It varies greatly and in the same proportion that the SWR presents. If the SWR is 1.486 to one, the impedances on the line can vary from 23.5 ohms to 52 ohms. This means that at every half wave ("Points A and A1"), the impedance evident at that point will be 35 ohms. At points "C", the impedance will be 52 ohms. Now if the feed line happens to be cut to an exact multiple of half waves, you can match 35 ohms to the rig. Now it is quite obvious that at other points along the line we will have impedance as high as 52 ohms. If by chance you have caught a point where the impedance is 52 ohms and your rig matches 52 ohms, you have reached the optimum and your transmitter will load properly. Now let's say your "appliance" refuses to do a good loading job at 35 ohms. It is obvious, that by tapping along the line, you're going to find a 52 ohm point and then your rig will do the job that it was intended for. Now, by pruning the line – you have reached an optimum point where the impedance of the line equals the impedance of the rig. You will show MORE APPARENT POWER being delivered to the antenna. The rig runs cooler and the SWR reads more like you want it to.

After tuning and "paring" with the resultant better match, it MIGHT be thought that the SWR of the antenna has been improved. Not so! Only matching the feed line to transmitter, has been effected. But the SWR of the antenna is still the same. If the SWR had been 1:1 – no "paring" would have been necessary. 5

The only way to match impedances for SWR is AT THE ANTENNA PROPER. ACTUALLY, A FEED LINE WITHOUT AN ANTENNA ATTACHED, CAN BE LOADED UNTIL THE PLATE METER CRIES, "UNCLE," but no signals will be radiated. AN SWR METER READS ONLY SWR AT THE POINT WHERE IT IS INSERTED. The result of this Paring has beneficial effects, but best results would come from properly matching the feedline to the antenna.

de VHFer W9HOV
and W8HHS

OFFICIAL BULLETIN NR 933 FROM ARRL HEADQUARTERS

The annual ARRL cross indexed Net Directory is now ready for distribution and copies are being mailed to those who have requests on file. Other copies will be mailed only upon specific request. There is no automatic mailing list. If you want a copy of the new ARRL Net Directory, mail or radio a request to the ARRL Communications Department, 225 Main Street, Newington, Connecticut 06111 \overline{AR}

NOTE TO GRAND ISLAND

After reading your announcement in the January Ham Hum concerning the Grand Island stations wanting to work into Omaha, I decided to give it a try. The past 6 weeks W0AFY and myself, have been on 50.4 trying desperately to work Grand Island. No luck as of yet. We try AM, CW, and SSB with considerable power on all modes. We will continue to try to work them

6

on Sunday nights at 21:00 on 50.4 in the future. Just a note to let you folks know we 6 meter hams up here in Omaha are trying.

73, Chuck, K0TVD

OFFICIAL BULLETIN NR 935 FROM ARRL HEADQUARTERS

The American Red Cross and the American Radio Relay League, working partners in major disasters for many years, February 5th signed a new statement of understanding aimed at increasing the effectiveness of future operations. Presidents Alfred M. Gruenther of the Red Cross and Herbert Hoover, Jr. W6ZH of ARRL were principals in the signing ceremonies. The new understanding is expected to further the organized cooperation of radio amateurs in their handling of disaster communications of concern to the Red Cross through the medium of the Amateur Radio Public Service Corps. Further information will appear in April QST \overline{AR}

NEW MEMBERS ADDITIONS TO ROSTER

Dan Kuttner, WN0FRS

545 South 87th Street
Omaha, Nebraska 68114

Howie Rosenberg
6604 Western Avenue
Omaha, Nebraska 68132

Will Wentworth
P. O. Box D
Waterloo, Nebraska

Robert A. Zolecki, WN9KPI/0
Treyner Missile Base
Treyner, Iowa

IT'S A STEAL!

All SSB Mobiles who would like to partake in a Group photo for purposes of obtaining a Natural Color postcard please call me for details. This is a once in a QSO deal and what's more I ain't makin' no profit on this one; only qualification being, your car must be washed, antenna up, and SSB mobile plus your deposit.....it's a steal.

Bob Miller, KØZLY

FCC FEES NOW REQUIRED

In case you missed the WIAW bulletin this is a reminder that amateur applications postmarked March 17 or later must all be accompanied by the appropriate fee. *The FCC filing fee schedule as applicable to amateurs was published in full, page 79, Dec. '63 QST* (Novices, mil-recreational, and RACES exempted). The Circuit Court of Appeals in Chicago dissolved the temporary injunction against FCC license application filing fees. Until the court has a chance to decide the basic question of principle, it has been ruled that FCC may go ahead and institute the fee requirement, provided there are complete records and that receipts are deposited in a special account. Accordingly FCC has announced that fees will be necessary with original applications for license or for modification or renewal, with the above exceptions, effective March 17th.

CD Bulletin

ATTENDANCE AND RAFFLE PRIZES - MARCH 1964

Unfortunately for Earl Olson, WØJKE, he wasn't present at the March general club meeting so OM Earl loses out on a \$4.00 attendance prize. This will increase to a \$5.00 prize for the April meeting, so please try and be there.

The raffle prize, a new Call-Book went to Henry Velte, WØABI.

The Miracle Mile Drive for Crippled Children on March 15th used 6 and 2 meter operation despite a last minute effort to find enough 10 meter operators to get in on the drive. I think Elmer, KØDFJ, did have a good idea in trying to get the 10 meter men in on these drives, but in the final analysis, we just don't seem to be able to get the fellows out. How about it? Could we count on a joint 2, 6, and 10 meter operation for the next drive in May? John, WØWRT

SCIENCE DEGREES

Doctor of Philosophy degrees were conferred upon Robert A. Stratbucker, M.D., WØHZE, Omaha, assistant professor of physiology and pharmacology at the University of Nebraska College of Medicine, and Abraham T. Wan.

dated Febr. 14, 1964

de the Pulse, U. of Nebr.

SSB "SIGNAL CLEANLINESS"; HOW TO WATCH AND ATTAIN THIS

Navy MARS Technical Information Message No. 10 deals with this subject with relation to the use of s.s.b. on one fixed frequency Navy channel. We amateurs of course work in sub-bands so our problem is not just the same. We do not have to have direct concern with the military band-width standards. However, we are each concerned with having (1) the best s.s.b. signal and (2) getting the most use from every available channel we can use. Lt. Comdr. Bob Mickley, Chief, Navy MARS, advises that the eleven page radio bulletin on s.s.b. (T.I.M. No. 10) was prepared by Comdr. Paul H. Lee, W3JHR, and that we're welcome to pass along those thoughts helpful to the general amateur problems. For that matter amateurs are welcome to tune in NAVI and copy the Tech. bulletins (4015 kc. 2330Z; 7380 kc. 2245Z; 14385 kc. 2200Z) on the 2nd and 4th Sundays each month, he reports. At any rate here are some applicable portions of W3JHR's message.

On the subject of s.s.b. signal cleanliness and how to achieve it... Let us discuss this since any signal that takes excess bandwidth can cause serious interference to adjacent commercial, military or other channels. An improperly adjusted station can radiate a signal with effects out of its sub-band. We all know how such side effects can interfere unjustifiably with communication on our channel! S.s.b. signal cleanliness can be defined in terms of r.f. bandwidth, carrier sup-

pression, unwanted side-band and intermodulation product suppression and audio frequency response over the desired bandwidth.

First let us look at some *causes* of unclean signals. Many of the manufactured equipments are reasonably clean, if adjusted by the designers instructions and operated properly. Others of us build our own gear, phasing or filter type. How then can we avoid bad signals? What are the things to watch for?

AVOID TOO HIGH SETTING OF THE AUDIO GAIN

1. The most common cause of unclean signals is overdriving. This can result from setting the audio gain too high, or the i.f. gain in an s.s.b. exciter, or by a faulty ALC circuit, or too much dependence on ALC with a high gain control setting. (W3JHR hears s.s.b. signals that cause the signal strength meter on his receiver to stand still while the operator talks, little fluctuation with voice peaks. This condition, he says, is always accompanied by spurious products extending many kc. each side of the passband.)

2. This type signal is caused either by ignorance, or not caring. The operator talks louder or turns up his gain to be heard better, so he thinks, by the distant station. The result is OVERDRIVING, peak flattening, and a spread spectrum. The signal is LESS READABLE than a clean signal and disrupts work on channels either side.

3. The plate current meter of the final amplifier in an s.s.b. transmitter should swing to no more than 50% of the peak envelope reading

with the average human voice. (See WIDF's article, page 11, November '62 QST.) Use of an audio compressor ahead of the s.s.b. exciter will do more to avoid generation of spurious products than will ALC, whose adjustments can change with loading or frequency. The compressor can prevent overdriving all the way through and give about 8 DB more "talk power."

OTHER SOURCES OF TROUBLE

One cause can be non-linearity in the transmitter. Any non-linear device is a source for cross modulation between two frequencies. The bias can be wrong. A resistor can change value. Non-linearity can be in any stage. Load impedance can be wrong. There can be a leaky bypass condenser or poor plate voltage regulation under varying load. Tubes can age and lose their peak emission capability. A tube can be fine for c.w. or Class C but not have enough emission for the peaks of s.s.b. service.

The microphone should not have undesirable peaks in its response curve as those can cause spurious product generation. If the response is not smooth, changes should be just drop-off at the ends of the audio range. Peaks in the filter passband can also cause overdrive even when the d.c. plate current does not seem to be swinging too high for overdrive and unclean signals. There should be gain enough in the equipment to modulate fully with the mike at least six inches away from the face. One cause of poor audio and unclean signals is a practice of placing the mouth right

on the microphone while talking.

MEASURING OR MONITORING FOR LINEARITY

How do you measure the cleanliness or linearity of your s.s.b. transmitter? One common method is to use the oscilloscope, with its familiar triangular pattern. This is generated by feeding audio input voltage to one set of scope plates with r.f. output on the other set...to show overall linearity. This is fine, as far as it goes. However, there can be a non-linear stage with a droopy curve and another in the opposite sense with unwanted coupling or feedback, and the output still having spurious products generated in these stages.

USING RECEIVER AS MONITOR, XMTR ON DUMMY LOAD

This leads to the useful suggestion that every s.s.b. station use a receiver of its own as a monitor. The transmitter of course must here be switched to a dummy load. A recommended way to check for signal cleanness without a two-tone test or a spectrum analyzer (the most sophisticated method, of course) is to play high-fidelity music into the transmitter (be sure that dummy load can't radiate!) and listen to it on your own receiver. With any ear at all distortion will be apparent, if any, much more so than on voice. IF YOUR SSB RIG SOUNDS CLEAN AND PURE WITH SUCH A MUSIC TEST - ON - DUMMY - LOAD THE CHANCES OF BEING CLEAN WITH VOICE ON THE AIR ARE HELD TO BE VERY GOOD. CD Bulletin

SIX METER CERTIFICATE

The Ak-Sar-Ben Radio Club, Inc., sponsors a certificate for working six meter amateurs in the Omaha area. This certificate is administered by Lou Pickert, W0CCD. In addition to the certificate, Lou personally looks after many people, with the help of the six meter hams in the area, as described in her letter which we quote as follows:

"First I think as a duty to the Ham Hum paper supporters, they should know what our Slave Certificate is for. We on 6 are Slaves to Charity; how well we are known as the 'Heart of Ham Radio on 6 Meters.' So let's live up to our name. We have donated 18 pints of blood - saved 2 lives and helped 4 people in hospitals by putting gear and antennas in the rooms. Then I started sending out cards to people in hospitals in other cities - who were hams. I then started getting parts from people (very few on 6 meters helped me,) mostly fellows in Iowa and Carter Lake - well, anyway I wanted to start a class for the delinquent boys, but that fell through so I'm sending boxes of parts to the School for the Blind at Nebraska City. Also for a seminary in New Jersey. Now I have a box of spare parts for the Shriner's Hospital for Crippled Children in Philadelphia to help them get their ham school started. So friends, our Slaves are really the best people in all the world because we keep the many needy who need friends all over - no matter where they are, they are our little friends. Thank you for listening and one more thing - we have one little girl in the Hattie 10

B. Monroe home permanently, who is our adopted child. (Slaves) So anytime you're out, riding around, go see little Sharon - she'd love to meet you."

"Grandma" Lou Pickert
W0CCD

P.S. "Yes, it's true - we gave out 31 dressed dolls and many other toys last year at Christmas."

Ed. Note: Thanks for your letter, Grandma, and just wish we could encourage more of our fine club members to write in and let us know what they're doing.

DID YOU KNOW

That when you send in your \$1.00 for the "Slave Drivers" Certificate issued by the Ak-Sar-Ben Radio Club, Omaha, Nebraska that the money is used to supply happiness to many children in hospitals at Christmas time? In a letter from W0CCD, "Grandma Lou", she states that they took in \$32.00 in "Slave Drivers" and \$80.00 was spent to provide happiness for children in the hospitals. Grandma is not asking for any money, but she could use some material for dressing dolls. A piece of material 12" long and 6" wide will make a dress and jacket for a doll. What say, gals, have any material to send her for a worthy project? Send them to; W0CCD, Louise Pickert, 3635 Olin Avenue, Omaha, Nebraska 68105

Pack Rats - Cheese Bits - Febr. '64

WHAT--NO GRID DRIVE?

Ah yes, grid drive, that precious, elusive commodity which seems to be lacking in sufficient quantity in most VHF transmitters of the "home grown" variety.

Here are the Rules

1. Use tubes designed for the frequency in use.
2. Use high "Q" tuned circuits in all stages preceding the "final." Avoid slug tuned inductors.
3. Use tubes designed to handle power (pentodes or tetrodes preferred) in all multiplier stages except the X-tal osc. section.
4. Have at least 5 or 10 times the drive available that the driven stages required. (As per tube manual).
5. Select grid bias resistors in multiplier stages for proper bias connected with their function as doublers, triplers, etc.
6. Do not skimp on stages in the exciter portion of the Xmtr.

Explanation of the Rules

1. Example for Rule No. 1. An 815 tube used as a P. A. stage on 144 MC will deliver poor efficiency although its maximum full ratings apply up to 125 MC. An 829-B or a 5894 is designed for full input ratings up to and above 144 MC. The tube charts list these figures. Pick a final tube (and preceding multipliers) for the frequency they are used on.

2. High "Q" tuned circuits mean greater circuit efficiency. Avoid slug tuned coils in multiplier stages of VHF transmitters. Use air wound inductors with tuning capacitors of the APC type whenever possible.

Large diameter copper or silver plated wire, with one wire diameter

spacing between turns, is best. Keep the coil away from the chassis by at least its own diameter dimension in spacing. Example: coil diameter is one inch. Space away from chassis and other metallic objects, one inch or more. Try to keep the diameter to coil "length" in a 1:1 ratio for best "Q."

Example: a coil with a 1" diameter should have a winding length of 1 inch.

3. Tubes designed to deliver power are best suited to VHF exciter use. Rather than using such tubes as 12AU7s, 6AK5s, 6J6s, etc., as oscillators, doublers and triplers, use such tubes as the 5763, 6360, 2E26 and 6146. Less driving power is required from the preceding stage and higher levels of power can be developed at moderate cost. Sufficient grid drive can seldom be developed with "receiving" type tubes.

4. Example: If the final stage tube specs. call for 2 watts of drive, select a tube capable of delivering 10 to 20 watts of output at the driving frequency. Coupling losses, and general circuit and component inefficiency prevent a large portion of the VHF energy from arriving at the grid of the driven stage.

5. Proper biasing is essential in all stages of the VHF Transmitter. When tubes are operated as doublers, triplers, etc., the same grid drive is required for each stage as is called for in "straight through" operation. The bias developed must, however, be considerably higher in order for the frequency multiplying tube to function properly. I have adopted a "rule of thumb" method which works

well in this application--increase the grid leak resistor value to twice or three times its normal value for straight through operation. This enables most tubes to multiply frequency with proper operating parameters. Remember, more drive is needed from the preceding stage to properly excite a frequency multiplier stage, than is normally used for straight through operation.

6. Don't be afraid to add an extra stage or two in the exciter portion of the VHF transmitter. A doubler or tripler will seldom provide enough output to drive another doubler or tripler. It is better to follow a doubler or tripler with a "straight through" amplifier before driving the next doubler or tripler stage. Avoid trying to develop power in the crystal oscillator stage. This leads to drift, instability and poor keying characteristics for C. W. operation.

Follow these simple rules when you build your next VHF rig. You'll have grid drive left over for the next rig you build.

De VHFer,
W8HHS

NOTES FROM THE BOARD

The Board received the resignation of Wendell M. Larsen, WØNPA, as a member of the Board, and in accordance with the Bylaws the Board selected Frederick Fischer, Jr., WØEGP, as a replacement. This action will be presented to the members at the April 10th meeting for approval of this selection.

LICENSE PLATES

Another FIRST for Newfoundland! As far as can be determined Newfoundland is the only place in the world that issues the call letters of some other country on its license plates.

American Amateurs who are stationed in Newfoundland and are permitted to operate here under the reciprocal agreement are now permitted to have their state-side calls on license plates.

The Nebraska Emergency Phone Net and the Nebraska Storm Net which meet daily on about 3982.5 Kc. at 12:30 P.M. and 6:30 P.M. CST respectively, (Storm Net at 7:30 P.M. CST after April 1st due to longer days) welcome any and all stations to check in.

This has proved to be an excellent calling and emergency frequency for Nebraska and the more stations monitoring and using this frequency the better it will be for all.

Larry, KØJ XN

3-12-64

Dear Dick:

Was surprised to find my technical article published in the new issue of Ham Hum. Was also surprised that you used it verbatim - at any rate it was real fun and thanks. Hope the more sincere Amateur Wireless operators get the true meaning and significance of this highly technical paper.

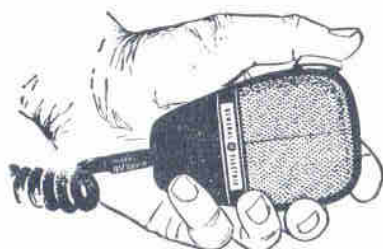
73 es best luck,

Harry, WA6HWB

Take a **firm** grip on
your future savings and earnings

with

A TWO-WAY
COMMUNICATIONS SYSTEM



Phone 341-8069

For Complete Tower Service - Engineering
Maintenance - Service and Installation

**GENERAL COMMUNICATIONS CO.,
INC.**

Omaha, Nebraska
827 South 20 St.

GENERAL  ELECTRIC

FOR SALE:

Wilcox 99A transmitter. Unit consists of two complete transmitters with common power supply and modulator. Dial selection of RF channels, each crystal controlled. Transmitters use two 6AC7's, 807, 813, and 250 TL. Modulator uses 813's. All mounted in six foot rack with room left to put in your VFO. With instruction book. Make offer. Also have some extra tubes including spare 250 TL.

Bill Kotchian, WØUGC
Home phone: 453-3492
Bus. phone: 346-1555



HELP wanted with experience. Am looking for club member holding any class license having the proper qualifications. Need a person who has rebuilt an old Ham receiver and can recall the problems encountered. Not a job. CALL John Orr WØPHW 393-3863, 8310 Emmet, Omaha, 24.

March 28, 1964.

There is an appeal for funds to help in the legal battle involving Mace Warner, WØJRQ, of Lakewood, Colo.

Please see the April 1964 CQ Magazine on p. 41 for further information on this lawsuit. There are also several other cases pending in different parts of the U.S.

Any one of these cases could set a bad precedent for the future of radio amateurs.

WØJRQ's case involves his right to have a tower and tri-band beam on his property. It is requested that any contribution anyone may wish to make be sent to Walter M. Reed, WØWRO, at 1355 East Amherst Circle, Denver, Colorado 80210.

de WØWRT, John

Jim Wilson WA4RXG recently had his sideband transceiver go haywire during a QSO with a W8. He was surprised to hear another station break in and say "You W4 down in Florida get that terrible sounding thing off the air. It sounds awful." Naturally Jim attempted to sign off at once but first WØEKJ and W9JOV broke in from St. Louis and Springfield, Illinois, respectively and with true ham spirit offered their services to trouble-shoot and try to locate the "bug."

Here you have the two kinds of hams: the kind that like to snarl and the kind that like to help.

OFFICIAL BULLETIN NR 942 FROM ARRL HEADQUARTERS NEWINGTON CONN MARCH 26, 1964 TO ALL RADIO AMATEURS \overline{BT}

The Staib expedition will soon be crossing the Arctic Sea and North Pole on skis. The explorers will be in contact with their homes in Norway only through good conditions and amateur cooperation for clear frequencies. They hope to work with nets established at home by the Norwegian Radio Relay League on 7014 7045 14,100 14,115 14,120 and 14,340 kc. The calls used will be L12C L12C/2 L12C/3 and L12C/4. Amateurs are urged to cooperate with the expedition and keep the frequencies clear when they are trying to work with the NRRL networks \overline{AR}

RED CROSS ARRL SIGN RENEWED UNDERSTANDING

WASHINGTON, D.C., Feb. 5 --

The American Red Cross and the American Radio Relay League, working partners in major disasters for more than two decades, yesterday signed a new statement of understanding aimed at increasing effectiveness of future operations.

Signing for Red Cross was Gen. Alfred M. Gruenther, ARC president. Herbert Hoover, Jr., W6ZH president of the ARRL and an amateur radio operator since he was 12, signed for the league's 100,000 members in a brief ceremony at ARC National headquarters.

In the statement Red Cross the ARRL provides "in maintaining continuity of communications during disasters and emergencies when normal communications facilities are disrupted or overloaded." In turn the ARRL recognizes Red Cross as "the agency chartered by Congress through which the American people voluntarily extend assistance to individuals and families in need as a result of natural disasters."

In signing, Gen. Gruenther paid tribute to the volunteer efforts of the amateur radio operators throughout the U.S. in support of Red Cross disaster operations. He said it "is fitting that we should sign this document during 1964, the 50th anniversary year of the American Radio Relay League."

Mr. Hoover took note of the common interest of Red Cross and the ARRL in promoting voluntary service in behalf of others.

Also on hand for the signing were Robert M. Booth, Jr., W3PS,

volunteer general counsel for the ARRL and a Washington attorney; F. E. Handy, W1BDI, ARRL vice president and communications manager, and John Huntoon, W1LVQ, ARRL secretary and general manager and editor of the amateur radio magazine, QST.

Copies will be made available upon request to the rank and file be they League member or non-league. Distribution is expected in the near future.

de Florida Skip

Mar. 14, 1964

I have received a communication from K3HNP, Dave Heller, 14 Darkleaf Lane, Levittown, Penn. that he collects old auto license plates of old call letters. He especially would like to have some plates from Nebraska and for the years of 1962 & 1963. He will pay postage if the plates are sent by either 3rd or 4th class mail.

Any help will be greatly appreciated.

Bob Thomas, WA0EGK
6327 Ogden St.

Omaha, Nebr.

ALL CLUB MEMBERS--

Be sure to subscribe to CQ & QST through your Club.

Your cost is the same, and we get a little coffee money.

See your Treasurer or any officer.

W0YEV

Ed Donze

2926 South 21

Omaha 8, Nebraska

**OFFICIAL BULLETIN NR 937
FROM ARRL HEADQUARTERS
NEWINGTON CONN FEB 20 1964
TO ALL RADIO AMATEURS BT**

FCC has announced that amateur applications mailed March 17 or later must carry the appropriate fee as shown page 79 December QST. The Circuit Court of Appeals in Chicago has dissolved its temporary injunction against FCC license fees. Until the Court has opportunity to decide the basic question it has ruled the Commission may institute its fee system provided complete records are kept and the receipts are deposited in a special account. Accordingly FCC has announced that fees will be required with any application postmarked March 17 or later AR

In reply to Marion's call to the XYL's of the club, I'd like to throw my card in the pot in favor of more activity for the women on meeting nights.

Cards, classes or just plain talk with a cup of coffee all sound good to me. Without the men I'm sure would be the best. If they had a special program we might be interested in, we could always join them.

If someone had a sweater she had started or some other sewing project that was portable, she could bring it along and work on it while talking. We all know women can talk and work at the same time.

Thanks for starting this Marion and I'll certainly help to put this across.

Vi Margritz, WAØBID

**OFFICIAL BULLETIN NR 934
FROM ARRL HEADQUARTERS**

In connection with reflective satellite Echo Two, amateurs are asked to record all received signals believed to be reflected from Echo Two and to notify ARRL immediately regarding the nature and extent of observed irregularities evidenced by variations in signal strength or tone. Please describe in as much detail as possible, identifying the calls received and indicating the time and date of reception closely. State whether circular polarization was used at either end and describe the tracking methods used with each stations antenna. Do not send recordings unless requested. AR

**OFFICIAL BULLETIN NR 939
FROM ARRL HEADQUARTERS**

Every active amateur is invited to submit a monthly station activity report to his Section Communications Manager on the first of each month. Your SCM welcomes club, net or traffic news as well as operational data from individuals and other groups, and also invites application for one of the many ARRL field organization posts available to qualified amateurs. Appointments are available along the line of your natural interest to aid in your operating pleasure. Novice or Technician Licensees interested in VHF may be eligible for Official Experimental Station appointment, while General and higher class amateurs may qualify for appointments such as ORS OPS OO or OBS, in addition to OES. SCMs will also consider application from Technicians for OBS and VHF PAM. Your SCM, address page 6 QST will be happy to furnish forms and additional data AR
