HAM HUM

Published by
AK-SAR-BEN RADIO CLUB, INC. - Omaha, Nebr. 68101
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November 1970

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No. 11

NEXT MEETING

WHEN: FRIDAY, NOVEMBER 13, 1970 – 8:00 P.M.

WHERE: RED CROSS CHAPTER HOUSE
432 South 39th Street, Omaha

WHAT: PROGRAM by Andrew A. Andros, WØLTE
President, Hy-Gain Electronics Corporation
and Galaxy Electronics, Lincoln

In addition to being President of these organizations, Andy is the Chairman of the Amateur Radio Section of the Electronics Industries Association. His remarks to us might be entitled "Is Amateur Radio a Dying Hobby?"

In his comments he will give us some answers to the following questions: (1) Has Citizen Band hurt Amateur Radio? (2) Will we lose some of our bands to CB? (3) Will we be able to retain our frequency allocations in the face of national and domestic pressures from the commercial interests? (4) How does the present FCC staff view us as a hobby and a service? (5) Is the ARRL an effective and progressive organization for amateur radio? (6) What is the amateur radio section of the Electronics Industries Association? (7) Is there anything amateurs can do to promote growth and strengthen amateur radio?

DON'T MISS THIS ONE!

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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.

Next copy deadline: November 27th

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AK-SAR-BEN RADIO CLUB, INC.
Post Office Box 291
Omaha, Nebraska 68101
Editor: Dick Eilers, WØYZV
Phone HOME: 391-2255
BUSINESS: 342-1402 - EX
Associate Editor: John Snyder, WØWRT
Phone HOME: 556-1538
BUSINESS: 536-4460
Associate Editor: Ervan Heinz, WAØEEM
Phone HOME: 553-2033
BUSINESS: 553-4700 - EX. 331

REPEATER CONTRIBUTIONS

Sincere thanks to all those who responded so generously to the appeal for additional contributions to help with the repeater. Here is a list of those who recently made cash contributions:

Charles F. Kelly, WAØUZX
Raymond F. Kydney, WAØWOT
Robert C. Lockwood, WAØDHU
Henry J. Dworak, WAØQLE
Hugh L. Tinley, KØGHK, etc.
Connie, WAØMYF, and
Norval Bowen, WAØNPF

Parts to be used for the repeater were donated by:

Joe Foster, WØWRE

We quote the following letter which indicates that a "pat on the back" is due Jim Droege, WØYCP, and others handling the repeater:

"Enclosed is a check for $25 which I wish you'd use for the repeater fund. This actually comes from the Red Cross, Farmers National Company and me, plus, OPERATION HELLO.

"Our association with Jim and all of the fellows who are handling the repeater couldn't be better. We have been a trial to them I know and they have done everything but stand on their heads to prevent problems and make this association a smooth one. The new tower they put on the fire escape over there has been a real help, with my beam at the top of it we're getting excellent performance on that long haul into Viet Nam. The Red Cross is now swinging over to 2 meters and the repeaters added a very useful tool to the Red Cross kit.

Sincerely yours,
H. L. Tinley, KØGHK
Vice President
Farmers National Company"

Incidentally, a total of $194.50 has now been contributed in cash to the repeater fund. We will be happy to continue to receive contributions of either parts or cash.

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SILENT KEY

WØRQS – Francis C. Miller

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1.

PAST PRESIDENTS' NIGHT

By Erv Heinz, WAØEEM

The sun came out after the pre-season snow storm and we had a full house for the Past Presidents' Eyeball QSOs on October 9th. Although considerable effort was expended to group them, picture 1 shows all who attended.

Left to right (standing): Ervan D. Heinz, WAØEEM (1967); Robert C. Lockwood, WAØDHU (1968); Royce E. Johnson, WAØKIL (1969); Max N. McKinney, WØYVV (1960); John A. Droescher, KØKWB (1961); John W. Orr, WØPHW (1952); Harold E. McClenahan, WAØDGA (1970).

Left to right (seated): Dick L. Eilers, WØYZV (1956); Arthur R. Gaeth, WØFQB (1947); Elmer N. Stein, Ex-WØAVM (1949); Louis A. Cutler, WØVLI (1964); Rev. R. J. [illegible]nge, WØQHG (1953).

President Harold McClenahan, WAØDGA, elaborated on Field Day and displayed the trophy which is now the permanent possession of the Ak-Sar-Ben Radio Club for having defeated the Bellevue Amateur Radio Club the past three consecutive years in Field Day competition.

One of the outstanding hams at Field Day was Ray Kydney, WAØ-WOT, who received a plaque for his effort during competition. Picture 2 shows President McClenahan making the presentation. Congratulations, Ray!

2.

3.

4.

The second winner was not present at the meeting and thus another plaque will be awarded for outstanding effort next month.

Jim Droege, WØYCP, elated about the new tower for the 2 meter FM repeater located on top of the Woodmen Tower, gave an enthusiastic report on 2 meter activity (picture 3). Be sure to read Jim's article in this issue of Ham Hum.

Oh yes, the youngest Junior Op made his debut (picture 4). You'll note the proud parents are The Andersons, Jim, KØDNE and Sharlen. Their bouncing boy is named Dan Lyn. Congratulations to the new parents!

A very enjoyable QSO followed the meeting with refreshments for all.

* * *

Your editor was delighted to receive news about four Past Presidents of the Club (1945, 1955, 1959, 1962) who were unable to attend the October meeting. The letters are ›ted for your interest.

Sorry I can't make Past Presidents' night. Enjoy Ham Hum. I moved to Phoenix, Arizona in 1951 and my call is W7RCF. Am not too active but am on 10 meters AM, 6 meters and 2 meters AM.

I worked at Motorola in the Government Electronic Center from 1951 to 1969 and am now retired. So hope to be more active on 10 meters. Hope to see some of you on 10 meters.

TNX 73s
N. P. Nelson
1836 N. 27th Place
Phoenix, Arizona 85008

Thank you for your nice letter of invitation to the Past Presidents Night on Friday, October 9th. Since Frank is in the hospital, he will not be able to attend, but I know his thoughts will be with you all, and he appreciates your special invitation. He is still on the air some and talks frequently to Ferris Kramer on Sunday mornings. You will be glad to know that he just got the long awaited card from Albania – ZA.

Frank spends a good deal of his spare time flying his Cherokee 180, and acquired his instrument rating this summer.

He is still President of FESCO, the country's largest plastic molding company – their trade name is Festival, and I know you have probably all seen his products – trash cans, waste paper baskets, laundry tubs, etc – also getting into toy business. Fesco is a division of Cities Service. He is still traveling a lot as usual, and I got to accompany him this winter to Japan with 10 days vacation in Hawaii enroute!

We only have one of our three children at home now – Cheryl is in the 9th grade – a very active little cheerleader. John graduated from Heidelberg College, Tiffin, Ohio this spring and after a trip to Europe is working in a bank in Columbus, Ohio. Linda is a sophomore at the University of Nebraska at Lincoln, and plans to attend the medical college at Omaha eventually.

Best regards to all our friends in Omaha.

73,
XYL Lotis Cooper
for the OM

I was extremely grateful to receive your invitation to the next meeting of the radio club honoring the past presidents. If at all possible I will be there, in fact I will make every effort to attend.

Pearl and I are now operating three H. Salt, Esq. Fish & Chips Shoppes and needless to say we have been kept very busy as we do experience a help shortage from time to time and we have to fill in. In addition to all of this (as if I don't have enough to do) I am establishing a printing shop, as it seems I cannot get the ink out of my blood. I should be ready to roll the presses in about two weeks from now. (Pass this along to Paul at Redfield). Business has been off in our area in Southern California as it is considered a depressed area due to the cutback in aerospace; as a result we are playing it

close to the chest, another reason for Pearl and I working as often as we do.

I have not been active on the air as of late. I lost my beam a couple of months ago due to corrosion and high winds and am preparing to work over the crank-up tower and procure a new beam. I am mobile locally out of the Datsun pickup. I was keeping a Sunday morning schedule with YZK but with no aerials this has gone by the wayside.

I married off one daughter last March to a musician and have more to go and hope it will be soon. Just Pearl and I are at home with the dog and we have plenty of room if any of the old Omaha gang comes out this way, as we are not too far from Disneyland. I was going on a trip to Europe but the charter I was booked on did not materialize so I stayed here and fryed fish instead.

Dick, if you are ever out this way visiting your offices in Los Angeles, please give me a call at our No. 3 shoppe and corporate office and there is usually someone here from 1030 every morning 7 days a week until 2200. They usually know where I am at. My home fone number is 532-5340. Hoping to see you out here sometime if I cannot make the trip to Omaha for the meeting.

Kindest personal regards to you and the family, best 73's.

Dave Hollander, W6COJ

Omaha, Nb., 5 October 70

Dick L. Eilers, Program Director,
AK-SAR-BEN Radio Club, Inc.,
P. O. Box 291,
Omaha, Nb., 68101

Dear Dick; The President; Officers; Members; OM; YL; XYL; Jr. Ops:

Thanks so much for your invitation to attend the club meeting honoring the Past Presidents of the Club. However, I must decline, with regrets, since I had received a previous invitation from Keith McCormic(M.D., who invited me to attend a special surgical clinic in my honor at The Methodist Hospital; since I am indebted to him, I hardly dared to decline his invitation. It seems that I have been especially chosen for the part I am expected to play in the clinical procedures.

The Club's program will be a real affair, with many of the Old Time Hams there, and I will greatly miss having my usual arguments with Max McKinney, Art Gaeth, Uncle Louie Cutler, and all the rest of the Past Presidents. I can almost hear WØVLI saying "Now when I was President--------." I hope that you have a big "turnout" of the "fossilated segments" that once stood up before the Club membership and tried to get the darned thing started on time, or a reasonable facsimile thereof.

I have now had a year of illness and surgery, and sincerely hope that this one will be the last of it. That alibi accounts for my lack of attendance recently at Club meetings. However, when I felt up to it, I did manage to put in some time on the Air Force MARS networks, and made some progress in hooking up with the repeater station. Believe me, you never know who to expect when you shout at that mike, and it is fun, as well(quite educational.

I will be at the Nebraska Methodist Hospital with a communicator on six meters, and will monitor the Air Force 49.98 MHz., and 50.4 MHz. Calls will

be very welcome after Saturday 10 October, so give us a shout.

Please give my 73 to all the Past Presidents, and 88 to all the YL and XYL. A very Hearty Hello to all Club members and your guests.

BT

Royal M. Enders KØLYO

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NEW MEMBERS ADDITIONS TO ROSTER

Leo F. Connolly, KØJIU
200 South 1st Street
Council Bluffs, Iowa 51501
Phone: CB 323-3550

Marion "Mike" Wilczynski, WBØBMV
6212 Kansas Avenue
Omaha, Nebraska 68104
Phone: 453-8024

Kent G. Williby
1268 Nebraska Street
Blair, Nebraska 68008
Phone: (402) 426-3797

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ATTENTION READERS

If room permits we are happy to publish ads in HAM HUM for our amateur friends. However, we do need a name, address and phone number.

Sorry, Fremont Reader, without your name and address we cannot publish your Clegg Zeus and Interpter "for sale" ad.

We might still be of service if any reader interested in this equipment will write in and the placer of the ad will write in with name and address, and we will put the two together.

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NEW PRODUCTS OF INTEREST TO HAMS

Latching Relay – Guardian Type IR 640L C 120

This item should find use in send/receive switching applications. The contacts are rated at 5 amps and are SPDT. Coil operates on 115 Vac 60 Hz. A push button to control this relay could be hit once to go to transmit, hit again to go back to receive. The latching relay could in turn control any other relays used for S/R switching. Unit price $4.75 (available H & R).

A very similar relay which operates on 6 or 12 V DC is available now from American Zettler, Inc., 697 Randolph Ave., Costa Mesa, CA 92626. This item could be used in mobile sets so that the mic control button would not have to be held down once the transmitter was on. To go back to receive, just hit the mic button again.

Solid State Power Controls – Ohmite Co.

Units like this could put variac companies out of business. The model PCA 1000 takes regular line input voltage and has an output varied by a small knob of 0-120 Vac at 8 amps. It is less than 2" sq. and has a depth of about 1" behind a panel. Besides being more compact than a variac, it weighs about 10% as much, and results in a saving of several dollars. Cost $17.

W3NSI, Lyn Rowland

(from: "Pack Rats' Cheese Bits", Phila. PA.)

via FEARL News

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Money still talks but it has to stop and catch its breath more often.

Service

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REPEATER UPDATE

Oct. 29, 1970

Well here I am again at the typewriter, many moons late again, but here is the latest development of our beloved repeater.

As many of you know, during the day the repeater had an intermod problem on the 440 receiver link that puts squeals and various other noises on the repeater through the day. It was decided that we should have more control than just "on" and "off" of the repeater by the 4 control stations. It was further decided that touchtone would be the most reliable means, so with some good luck and many parts and hours later, one was built. It has 5 "on" functions and one "off" function.

We now have hooked up at the repeater the following functions: repeater on; 440 receiver repeat turn on; tape recorder run out bypass; and in the near future plan to have a preamp on function. With the tape bypass, one of the control stations can see if the tape machine has run out of tape and send someone up to replace it. Also, the 440 receiver can be shut down, eliminating the intermod problem from the 440 receiver, and the old required function turning the whole mess on and off.

Wellllllll, it all looked good on paper and after the usual debugging it worked well. Then the gremlin set it and was turning things on and off at will. After much searching and nasty words, it was determined that the low frequency gear at the Red Cross was the gremlin. The rf from the 2KW equipment was actually getting into the SCR matrex system that decoded the information from the touchtone decoder. What to do now? What else, put a local control at the repeater with lights indicating which functions were on or off. After more procurement of parts and many hours of labor, it was installed. To my knowledge, since they can see the unit actually shut on or off while they are working the low frequency equipment, the reliability of the repeater is excellent.

As some of you have heard, our beloved leader General Bullmoose, otherwise known as Hugh Tinley, had put the gears in motion to get the new Woodmen Tower for a receiver site. The gears of red tape are still turning as of the date of this report it could go either way, but we are still keeping our finger crossed.

I know of a 450 MC system that is on top of that building that talks to 15 watt mobiles in Lincoln like they were local. If we do get the site it is planned to install a receiver up there and run telephone lines to the Red Cross and still maintain our present receiver as a standby in case the telephone wires fail. It is also further planned to have a standby transmitter at the Red Cross in case the phone line to the Old Methodist Hospital would fail.

All in all I would say our repeater is growing, and as more get on the frequency and support it, it will grow even more. I would like to thank Bob, WØYSX, Joe, WAØWRI, Ray, WAØ-WOT, and Neal Johnson (no call and not a member) for their help on the touchtone decoder; and Stan, WBØBTL, for his sole effort in building the local control of the repeater.

At the last Club meeting I

mentioned there were several types of tubes used for the repeater and it would be handy to have some spares. If you have unused tubes (surplus, etc.) floating around and don't have a that uses them, send to John Snyder, WØWRT, or me or see us at the next meeting. Here is the list:

6BH6 6AQ5 6A15 12AX7 6BQ7
6AV6 6J4 6AB4 6U8 5894
12BY7 6AK6 12AT7

James C. Droege, WØYCP

P. S. If I left out anybody that helped on the last two projects, please sock me at the next meeting.

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Ak-Sar-Ben Radio Club

Always enjoy the home town news. Back from my tour in S.E.A. and am stationed at Andrews AFB, Md., 89th Military Airlift Wg.

New address: 7913 Eton Lane, Clinton, Maryland 20735

73's

WØNOW, Major John Haley

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OFFICIAL BULLETIN NR 293 FROM ARRL HEADQUARTERS NEWINGTON CONN OCTOBER 15 1970 TO ALL RADIO AMATEURS BT

Concurrent with the October 25 shift to standard time throughout the country, W1AW will resume its Fall Winter schedule. Code practice will take place at 0030, 0230 and 1400 GMT, which converts to 4:30 pm PST, 6:30 pm PST and 6:00 am PST. The October issue of QST carries this new schedule. Printed copies are available upon request. Please send your addressed stamped envelope to ARRL, 225 Main Street, Newington, Connecticut 06111 AR

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FOR SALE

Precision brand E-200C AM signal generator. Good for IF, BC and HF alignment.

John Snyder, WØWRT
Home Phone: 556-1538

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SEPTEMBER 2, 1970

CURRENT ASSISTANT DIRECTORS
MIDWEST DIVISION ARRL

Raymond L. Keller, WØDU	2033 Bellevue Ave.	Maplewood, Mo. 63143
James E. McKim, WØCY	1404 South 10th St.	Salina, Kans. 67401
Vernon L. Modeland, WAØJOG	Box 115 – Star Route 4	Reeds Spring, Mo. 65737
Richard W. Pitner, WØFXO	2931 Pierce St.	Sioux City, Iowa 51104
Jesse R. Richmond, WØNNM	Main Street	Hamilton, Mo. 64644
ld Schweppe, KØEXN	2008 Downing	Garden City, Kans. 67846
ert M. Summers, KØBXF	3045 North 72nd	Kansas City, Kans. 66009
C. W. Wade, WØINH	P. O. Box 123	Goodland, Kans. 67735
George D. Meserve, WØHG	8212 Briar Lane	Prairie Village, Kans. 66208
V. A. Cashon, KØOAL	P. O. Box 488	Chadron, Nebr. 69337
Dick L. Eilers, WØYZV	7838 Poppleton Avenue	Omaha, Nebr. 68124

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OPERATION HELLO

It has been over five years since "Operation Hello" was first inaugurated in Omaha, Nebraska. Since that time the Military Affiliate Radio System and many dedicated amateur radio operators have made it possible for thousands of servicemen to converse by phone and radio with their loved ones at home.

As the result of over 40,000 calls that have already been completed, many, many letters of appreciation have been received. For your interest we quote a typical "thank you" letter.

June 30, 1970

Farmers FN National Company
4820 Dodge Street
Omaha, Nebraska 68132

"Dear Wonderful People:

"A few weeks ago my aunt, Mrs. Luz Elizalde, received a call from her grandnephew, Steve Michael Martinez, who is in Vietnam.

"I do not know how many of you good people were involved, but may God bless all of you, or rather may He continue to bless you since He has already blessed you by giving you the thoughts, ideas, and know-how to carry on such a worthy project.

"My aunt called me at work after the call was completed, and I will never be able to describe the happiness in her voice. She had already called Steve's father to whom it was not only a joy but also a big relief since Steve had not written home for over a month.

"My aunt continues to recall the wonderful experience you provided. Every time she talks about it she seems to glow with happiness. We know this will continue for the rest of her life.

"To say 'thank you' for such a great feat as 'to bring Steve, from far away in Vietnam, to talk with my aunt in an ordinary kitchen in Alamogordo, New Mexico,' seems very inadequate. There are no words to express our gratitude; may God continue to bless you and reward you for such a tremendous job.

Sincerely yours,
Julia Martinez
806 Hawaii Avenue
Alamogordo, New Mexico
88310"

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CODE PRACTICE SCHEDULES

According to a report from W6CX, code practice material is transmitted six nights per week by W6QIE, in South San Francisco. Time is 8 PM local time on 3590 kHz on Tuesday through Sunday. Speeds are 5 through 30 wpm, with a total of one and a half hours of practice. Speeds include many intermediates such as 8, 11 and 13 wpm.

W6ZRJ code practice bulletins remain as before, on Tuesday, Wednesday and Thursday evenings at 7:30 PM local time on 3590 and 7129 kHz simultaneously. This code practice is primarily for the transmission of bulletins as well as extra code practice. Speeds are 10 and 15 wpm on Tuesday, 20 wpm on Wednesday and 25 wpm on Thursday. Bulletins are repeated each night but in a different sequence . . . W6ZF bulletin schedule is on the first and third Mondays of each month at 8 PM on 3540 kHz.

de Fresno Skip

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HOW TO DEAL WITH RADIO FREQUENCY INTERFERENCE

DON'T LET ELECTRICAL AND RF NOISE GET YOU DOWN!!

This article has been prepared to assist personnel who experience interference to Hi-Fi equipment, Tape Recorders, Record Players, Television Sets, and other audio devices.

Interference to such equipment can be caused in many ways. Loose electrical connections within the household, fluorescent lamp hash, diathermy and X-ray equipment, defective transformers or insulators on utility poles, automobile ignition, powered mowers, electric motors, and Amateur Radio Equipment, are to mention a few. There are ways to eliminate interference if it does occur.

Much of the interference can be traced to the equipment in use. How it has been installed in the home, and how it has been connected together.

To purchase a piece of Hi-Fi equipment off the shelf, carry it home, hook it up, then sit back and wait for the beautiful sounds to come out just isn't possible. Components must be connected together properly. Shielded wire or cable must be used. Leads should be short, especially leads from main amplifiers to tape recorders to speakers. No loops or loose wires between units. Excess cable acts as an antenna and picks up "Garbage."

If you experience interference, and you have a BX item, it is suggested that you contact the Hi-Fi technician at the BX and make arrangements for one of the servicemen connected with the name brand of the equipment you purchased, (Sony, Akai, etc.) to call at your home and look over the installation job. He may be able to cure your troubles in a matter of seconds, or, make a few adjustments to the equipment. Stubborn cases of course will require perhaps additional shielding or by-passing with capacitors the 110 volt input to your equipment.

A good ground is necessary. This may be a water pipe or a rod driven into the ground. The lead must be short, as a long ground wire will also act as an antenna and pick up "Hash." In some cases, interference can be eliminated by just reversing the electric plug that's in your wall outlet.

Real stubborn cases can be eliminated by using a "Brute Force Filter." It's very easy to make or filters of different types can be obtained on the local economy at very reasonable prices – a good investment and will improve your equipment 100%.

Brute Force Filters can be made by a radio technician. It is not suggested that anyone attempt to construct one unless he has a knowledge of the working principles. If not properly constructed, they can overheat and cause fires and blow fuzes.

Instructions on how to make a Brute Force Filter may be obtained from any radio engineering handbook, ARRL Handbook, etc.

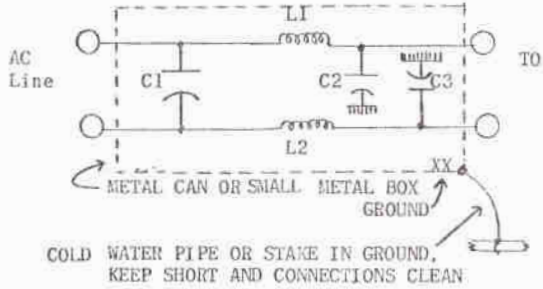
Your selected serviceman can assist you in this matter.

If you experience interference from an Amateur Radio Station, contact the Amateur and request his assistance. He may *not* be the amateur causing the interference. Just because you observe an antenna in your area, don't be too quick to accuse. Amateurs located

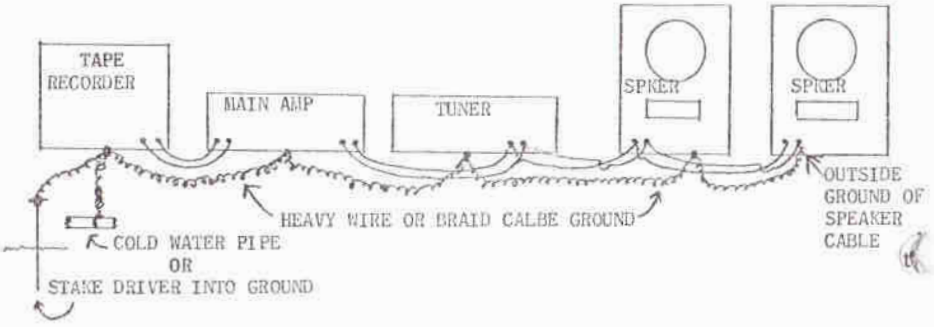
within a radius of 25 miles or more can cause interference to Hi-Fi and audio devices.

Amateurs spend thousands of dollars on equipment. If it's a commercial product, it must meet Government specifications and has built-in suppression to eliminate interference. Just because you hear noises coming out of your equipment, it's not always the amateur's fault. The cause of interference may be right in your own set. If you are certain that an amateur is causing the interference, then contact one in the neighborhood. He can help you if you approach him in the proper manner. You are not going to get him run off the air because you hear noises in your equipment. Amateur radio stations are Auxiliary Military stations and assist in emergencies. Your manner of approach can save the day. Most "Hams" are cooperative and want to see you enjoy your hobby as much as they enjoy theirs.

The diagram below is a "Brute Force Filter" and can be constructed in a coffee can or a small metal box. It will work wonders towards eliminating all sorts of power line interference, including amateur interference.



An additional factor to eliminate interference is to bond all units in your Hi-Fi and recording equipment together to a common ground. Keep leads as short as possible.



Prepared by: Ed. A. Bibbins, KA2EB/W1EDW/AI1EDW General Manager FEARL(M)
de FEARL News

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FOR SALE

40 foot Spaulding tower with hinge concrete base. About 6 months old.

Free, beat up but repairable, -Gain 6 & 2 log periodic with tower.

Chuck Conner, WØNGG
(Ex-W8DZS/Ø)
704 West 31st, Bellevue
Phone: 291-0237

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October 4, 1970

Dear Friends:

Thanks to your kindness in sending me Ham Hum, I now am the proud possesser of a Galaxy GT550 from the estate of Scottie, KØWFG. You advertised it in the May issue and after considerable correspondence it arrived in Rutland and I picked it up on September 25. As soon as I get a suitable antenna up, which should be this coming week, I will start listening for WØ calls from the Omaha area and maybe we can work. I prefer 10, 15, and 20 to the lower bands.

I have enjoyed reading Ham Hum and when I get solvent after moving from Connecticut I will send you a small donation to keep it coming. I expect to build that three-element Vee from one of your later issues.

73,
Frank, K1JZU

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FOR SALE

'ycom 6 & 2
ansmitter-Receiver

AK-SAR-BEN RADIO CLUB, INC.
P. O. Box 291
Omaha, Nebraska 68101

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OFFICIAL BULLETIN NR 292 FROM ARRL HEADQUARTERS NEWINGTON CONN OCT 8 1970 TO ALL RADIO AMATEURS BT

The Senate Commerce Committee heard testimony October 8 concerning Senate Bill 1466 which would allow amateur radio operation by future United States citizens. Senator Barry Goldwater K7UGA spoke in support of the bill which he had introduced. Other supporters at the hearing included FCC Chairman Dean Burch, ARRL President Bob Denniston WØDX, ARRL General Manager John Huntoon W1RW and ARRL General Counsel Bob Booth W3PS. Further information will appear in the December issue of QST AR

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OFFICIAL BULLETIN NR 294 FROM ARRL HEADQUARTERS NEWINGTON CONN OCTOBER 22 1970 TO ALL RADIO AMATEURS BT

The world's first 2300 MHz moonbounce contact was accomplished on October 19 between W3GKP and W4HHK on a frequency of 2304 MHz. This represents the highest frequency band, to date, on which amateurs have successfully employed earth-moon-earth communication. This contact comes after a period of extended experimentation between the two stations. Background on the preparation for this contact appears in July 1969 QST, page 54. A future issue will carry details of this record breaking contact AR

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SOLID STATUS

By Dick Blasco, WA4DHU 2

"Transistors are here to stay." This statement might disturb a few hams, but it is a fact of life for everyone interested in electronics. The fact that many amateurs have been slow to accept solid state electronics is due primarily to two reasons: 1) Transistors are a little trickier to bias than tubes; 2) Basic transistor theory has been presented to the ham on a level really needed only by engineers, with quantum physics, band diagrams, loop and transcendental equations thrown in to both confuse and impress him.

The first objection must be lived with, but it isn't as bad as it seems. It will be shown that for practical transistor biasing, you can get by with Ohm's law and a handful of assumptions. The second objection is quite valid, however. All of the "highfalootin' rigamarole" everybody goes through was necessary in the days when it was hard to believe that a little piece of rock can amplify. However, there are so many transistor radios and stereos around that most people now believe in transistors, and there no longer is a need to show mathematically that they will work, or why they work. I wonder how many hams would have accepted vacuum tubes if they first had to learn static field theory and electron ballistics. Not very many. But if you look at it, vacuum tube theory and manufacturing techniques are quite involved when you get into the nitty-gritty of it. So these articles will ignore the modern physics and attempt to present transistors on the same level that tubes are presented to amateurs.

The nature of the beast.

Transistors and diodes are generally made from either Germanium or Silicon. There are two types of each used in these devices. P-type and N-type. The place where the two types of materials come together is called a junction. When a P-N junction is hooked up to a voltage supply as in figure 1, current will flow across it as shown in figure 2. Assuming that current flows from positive to negative (which only gives a common convention – this theory could just as easily be explained with current flowing the other way): notice that when positive voltage is put on the P material and negative voltage on the N material, very little current flows until a "barrier" potential (0.3 volts Germanium and 0.6 volts for Silicon) is reached. After that, current increases very rapidly with very little increase in voltage. This barrier voltage depends almost entirely on the type of material and has little to do with the physical size of the junction. This is the FORWARD BIAS condition.

Turning the battery or voltage source around so that negative voltage is on the P material and positive voltage is on the N material, the REVERSE BIAS condition occurs. Very little current flows until the "reverse breakdown voltage" is reached, past which current increases rapidly with small increase in voltage. This reverse breakdown voltage depends on the size of the junction and the degree to which the material is P or N type. Thus the reverse breakdown voltage varies widely from device to device, and can be anywhere from 5 to 3000 volts. When a junction is carefully designed, the reverse break-

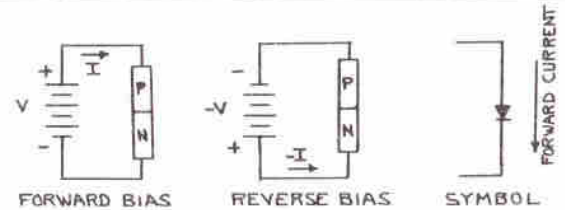

FIGURE 1 - DEFINITIONS

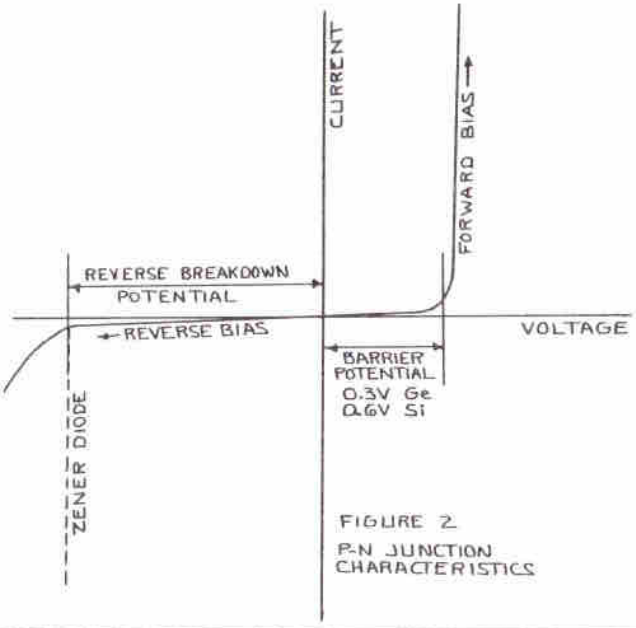

FIGURE 2.
P-N JUNCTION
CHARACTERISTICS

down curve can be made quite sharp, as shown in figure 2, and you have a "Zenner" diode which can be used for voltage regulation.

Notice that if the junction bias voltage is between the reverse breakdown and forward barrier potentials, the junction appears to be an open circuit, and if the voltage is greater than the barrier or breakdown voltage the device looks like a short circuit.

The symbol for a P-N diode is shown in figure 1. NOTICE THAT THE ARROW ALWAYS POINTS IN THE DIRECTION OF FORWARD-BIAS CURRENT FLOW, assuming current from positive to negative. The arrow also always points toward the N material. This same convention is ALSO TRUE FOR TRANSISTORS.

That is the nature of the P-N junction, which is central to all solid-state theory. The next article will explain some of the basic characteristics of transistor behavior.

de Florida Skip

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POWER SUPPLY DESIGN
(SSB)

Duty Cycle – Max. Power Output/total on time

For SSB service = 50% or less (can be as low as 25% of PEP). For CW service = 50% of peak power output. ALC or voice compression raises the duty cycle. Power capability of transformer can be judged by its weight. IVS rating dependent on DC resistance of xformer secondary and weight of transformer. Fig. 1 shows relationship of power capability to weight. This weight includes case and mounting fixtures. IVS rating difficult to apply to small xformers as shown by Fig. 1 (min. weight 5 lbs). Example – a 12 lb xformer would have commercial service rating of 250 watts and an IVS rating of 600 watts. Consider continuous current (stand-by current) taken from supply by bleeders, idling current, etc. Consider breakdown voltage of xformer, particularly at center tap. Ground xformer frame.

Diode consideration – use diodes with at least 600V PIV rating. 1A Avg. current rating and 15A or better surge current rating.

Filter capacitor – use computer grade capacitors. Series for higher voltage rating – using voltage equalizing resistors across each – 10V – 10W.

Protect diodes from inrush capacitor charging current. Use limiting resistor in primary of power xformer. Can be eliminated from circuit by manual switch or automatically by relay and time constant circuit. 0.5 sec. or more time delay required.

Full wave voltage doubler circuit can be used. Saves xformer weight and expense. Use Fig. 1 and 2 for aids. Basic power supply circuit shown in Fig. 3.

DC working voltage of capacitor stack = 1.41 x RMS V+15%.

AC secondary voltage, resistance, circuit reactance and IVS capability of a xformer will determine a xformer's excellence in a voltage doubler. These parameters lumped together and expressed empirically by R' factor, Fig. 2.

Formulae used for the design of an IVS power supply

1. E no load = 2.81xe e = RMS secondary voltage
2. E load = E no load – R' (IxR)
   R' – from Fig. 2
   I – full load current in amperes
   R – secondary resistance of the xformer
3. Diode PIV = (2 x E no load) + 100%
4. No. diode = 11.2 x RMS volt/diode PIV

Example: –

Assume – Transformer weight – 20 lbs.
Secondary voltage – 750V RMS
Secondary DC resistance – 7 ohms

From Fig. 1 IVS rating = 1.15 KW PEP

No load DC voltage = Enl = 2.81 x 750 = 2102.5 V.

For a one KW capability, 0.500 amperes of current is required.

E load = Enl – R' (IxR) = 2100 – 64 (.5x7) = 1876 V. Power supply will deliver 1875 V at 500 MA. = 937 watts input. No. of diodes = 8300/600 = 14 (assume 600 V PIV diodes). 14 diodes required – 7 diodes per stack.

240 mf 450V. computer grade capacitors used in filter network

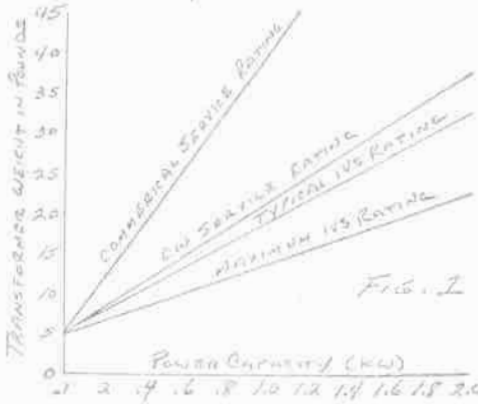


FIG. 1

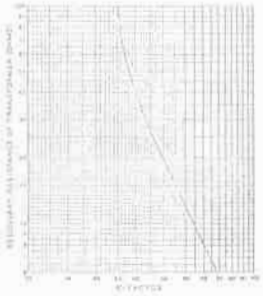
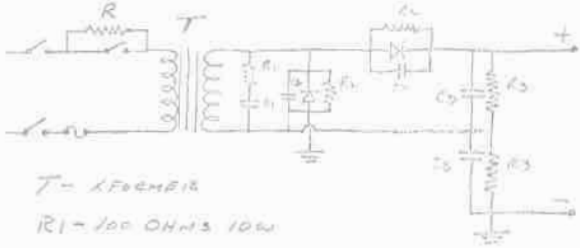


FIG. 2
R' FACTOR



T – XFORMER
R1 – 100 OHMS 10W
R2 – 470K 1/2W
R3 – 10 Ω 10W
C1 – .02 MF 2KV
C2 – .01 600V CERAMIC
C3 – COMPUTER GRP TYPICALLY 120 – 240 MF AT 450V.

FIG. 3
IVS BASIC POWER SUPPLY CIRCUIT

R is inrush limiting resistor – can be 60W lamp or 100 ohm 100 watt resistor. Switch shorts R out after capacitors are charged. Switch can be relay with at least 0.5 sec. time constant.

REFERENCE – Radio Handbook, 17th Edition, W. I. Orr, Editors and Engineers, LTD. P 725-728

John B. Power, W2AXU
4/2/70
de Pack Rats, Phila. Pa.
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ANTENNA INSURANCE

By WA4ABY

(Editor's Note: Here is a timely article everyone should read carefully. A word to the wise—check into it now!)

Imagine what could happen to you in the future. The high winds of a hurricane are screaming around your house. Cringing at the danger, you nevertheless attempt to fulfill the public service requirements of your license by providing needed communications for your local civil defense because phone service is out. Suddenly, you hear a loud crash. Water starts gushing into the shack, and all your power cuts off. Admitting defeat, you hastily retire with your family to a nearby Red Cross shelter to wait out the vicious storm.

After the destruction is over and the sun is shining brightly again, you survey the damage to your property. Among other things, you are shocked to find that your fifty-foot tower topped by a complicated array of HF and VHF beams has broken away from its secure guys to fall on your shingled roof, gouging a sizeable hole in it. In a state of shock, you are partially comforted by the fact that you are completely covered by insurance. Your house and antenna array will soon be in one piece again, paid for by those premiums you've been paying your insurance company the past twenty years. Wistfully perhaps, you dream of the new and better array you'll install with all that insurance money. After all, you are covered.

OR, ARE YOU?

"Not unless the ham specifically asked and paid for coverage not normally found in most homeowner policies," says Ray Bowen, Agency Manager for State Farm Insurance Company in Miami Springs. FLORIDA SKIP interviewed him to find out the specifics of antenna coverage. When does the insurance company pay for damage to ham antennas and when don't they? Although the facts presented apply specifically to his company, all insurance companies writing homeowners policies in Florida offer the same coverage and exemptions. Only the rates given may vary from company to company.

"Radio and TV antennas of any type, their towers, lead-ins and other components are specifically exempt from windstorm damage," says Bowen. "State Farm will provide this coverage for an added premium, which, frankly, is fairly expensive. We used to include wind damage to antennas, but with the rise in their number and their vulnerability in wind, we found it necessary to exclude them from ordinary homeowner policies. It's a fact in this business, that as losses go up, the company must either raise premiums, or add exclusions."

Depending on whether your antenna is attached to your residence or separate, State Farm charges an extra 5.4 to 9.2 per cent for all-metal antennas and towers to an extra 14.25 to 17.75 per cent for an antenna structure with any non-metallic structures (bamboo quads and the like.)

This is a fact of life in windy Florida that our pluckless ham didn't know about, Now he is out the cost of that expensive array. However, Bowen noted that roof damage caused by the falling antenna is collectable. "In this

case, the instant the antenna started to come down, it became a falling object. Any damage it does is covered in all homeowner policies," he points out.

Other items specifically excluded from windstorm damage are awnings, pool screens, and any object not attached to the residence proper, such as tool shed, children's doll house, etc. In insurance lingo, these are appurtenant structures."

As the 1970 hurricane season nears, it would pay to check to see that your antenna is protected. If it would break you to buy a completely new antenna farm, then it probably would be prudent to pay the extra cost of protection. It's up to you of course, but don't be sorry when a hurricane pays you a call this summer.

de Florida Skip

(Ham Hum Editor's Note:

As this article refers to one insurance company and one state of residence, it would behoove you to check with your own insurance man specifically on the subject of antenna coverage both as to physical loss and the liability that may be involved.)

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Why should we grumble over the lack of parking space? It took Noah 40 years to find one. —Service

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The Cloverleaf has long been taken to be a symbol of good luck; do you suppose that is why that term was chosen for the interstate and freeway intersections? You'll be lucky if you get off it headed in the right direction!

de Fresno Skip

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AN ITEM FOR THE RTTY HAMS

Amateurs who are interested in Radio Teletype will find a lot of useful information in the magazine "RTTY Journal." This little magazine is a monthly publication and can only be obtained by subscription. It has published many "firsts" articles on building and modifying Teleprinter and Terminal units. Also articles on operating and theory. Irv Hoff, W6FFC, is one of the writers and has published many excellent articles in the Journal. To keep up with the lates ideas in RTTY, this magazine is highly recommended. Subscription is three dollars a year . . . The address is: RTTY JOURNAL, PO Box 837, Royal Oak, Michigan 48068 . . . The Mainline ST-3 RTTY Demodulator by Irv Hoff is featured in the April '70 issue of QST. This is a good TU and a builder can get the printed circuit board and kit of parts. Refer to QST for further details. (de W6PW, S.F.R.C.)

de Fresno Skip

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OM, carefully examining his paycheck, "Well, I see that the government got another raise."

Ham Monitor

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These tickled me — how about you? Life may begin at 40 but you are going to miss a lot of fun if you wait that long . . . There are fewer accidents caused by loose brakes than by tight drivers . . . In the long run a pessimist may be proved right, but the optimist has a better time on the trip . . . Spilt milk is udder waste. (Ham Monitor)

de Fresno Skip

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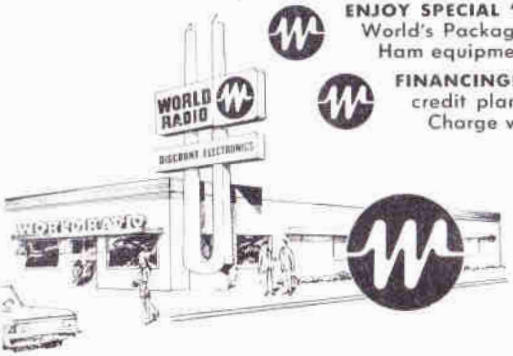

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