



# HAM HUM

Published by

AK-SAR-BEN RADIO CLUB, INC. - Omaha, Nebr. 68101

Post Office Box 291 - Downtown Station



Vol. XVII  
No. 10

October 1967

## OCTOBER MEETING

Next meeting of the Ak-Sar-Ben Radio Club, Inc. will be held in Room 260, Engineering Building, University of Omaha, on Friday, October 13, 1967 at 8:00 P.M.

Charles Michel, KØQVL, and Bruce Stackhouse, WØRIN, will present a program on Aircraft Radio Systems. They will describe a typical radio system of a small single engine light plane; show some of the circuitry involved and explain how it works; and demonstrate how the pilot uses it for navigation purposes.



Don't miss this one! We're sure you will enjoy the program.

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## WWV PROPAGATION FORECAST

The propagation forecast is given from WWV at approximately 19.5 and 49.5 minutes past each hour and from WWVH at 9.4 and 4 minutes past each hour. The forecast from WWV refers only to the North Atlantic radio paths. From WWVH, the forecast is for the North Pacific paths, such as Seattle to

Tokyo. A letter and digit are given:

(W) means "Disturbed"

(U) means "Unsettled"

(N) means "Normal"

(1) useless; (2) very poor; (3) poor; (4) poor to fair; (5) fair; (6) fair to good; (7) good; (8) very good; (9) excellent.

de East Whittier RC Bulletin

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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.



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## THE "ELEKTRON" THEORY

About 600 B.C. the Greek philosopher Thales of Miletus was performing parlor tricks with straws and bits of paper. He would pick them up with an amber rod which had been rubbed with a cloth. The Greek word for amber is "elektron," and since these basic experiments were forerunners of modern electronics, the Greek name was applied and is still used.

Benjamin Franklin, in about 1746, began his experiments with electricity. He developed a practical electrical capacitor for storing static electricity. He also developed a coherent fluid theory of electricity, but unfortunately guessed wrong about the direction of current flow, which he thought took place from the positive to the negative terminal of a current source. The error was not discovered until the present day electron theory had been developed. By that time it had become 'conventional' to describe current as flowing from plus to minus.

The modern theory has been successful in explaining electrical and magnetic behavior. We now

assume that current flows from the negative or minus terminal of a source to the positive or plus terminal.

Some older texts and many theoretical journals may yet discuss electronics using the 'conventional' method. Most modern texts and practical applications assume the negative to positive for explanations of electronics.

\*\*\*\*\*

Sept. 12, 1967

Hi:

Thanks for Ham Hum. Sure enjoy keeping in touch. Post Office has been forwarding it.

73's to all,  
Pete Trapolino, WØJHU/6  
New QTH:  
525 E. Las Palmas Dr.  
Fullerton, Calif. 92632

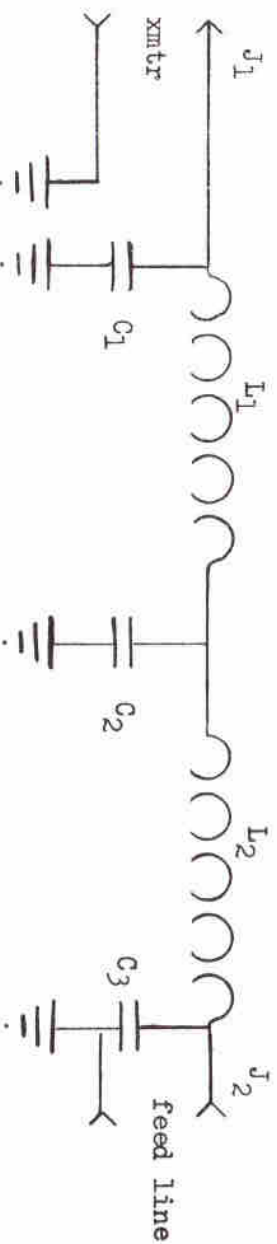
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After you've heard two witness accounts of an auto accident, you begin to worry about history.

de Fresno Skip

\*\*\*\*\*

# TVI



## HALF WAVE FILTER FOR TVI FOR NOVICE USE

$C_1, C_3$ : 820 MMF. Mica 500 volts, 3.5 Mc.  
470 mmf. Mica 500 volts, 7 Mc.  
100 mmf. mica 500 volts, 21 Mc.

$C_2$  : 1500 mmf, (0.0015)mf. mica 500 volts, 3.5 Mc.  
1000 mmf, (0.001 mf.) mica 500 volts, 7 Mc.  
200 mmf, (0.0002 mf.) mica 500 volts 21 Mc.

$J_1, J_2$ : Phono Jacks.

Entire unit may be built in coffee can for shielding.

$L_1, L_2$ : 3.5 Mc: 11 turns No 20, 16  
turns per inch, 1 inch diam.

B&W Miniductor 3015

7 Mc: 8 turns No 18, 8 turns  
per inch, 1 inch diam.

B&W Miniductor 3014.

21 Mc: 7 turns No 18, 4  
turns per inch,  $\frac{1}{2}$  inch diam.

B&W Miniductor 3001

de Fresno Skip

## HAMFEST

The annual Ak-Sar-Ben Radio Club Hamfest was held September 10th at Beaverbrook Farm. Pre-registration and gate registration set new records. Members of the Club cooperated by putting on one of the most successful and enjoyable events of the calendar year. (Picture #1) - Here is where members and guests registered for steaks and door prizes. (Picture #2) - Ed Kilton, KØEYR, Jim Knudsen, WAØMHF, and Royce Johnson, WAØKIL, barbecue choice T-Bones to everyone's taste. (Picture #3) - "Make mine medium rare!" says Ed Donze, WØYEV. (Pictures #4 and #5) - Over 100 steaks and one-half servings for the kids were barbecued in a record 35 minutes and devoured in less time. A delicious covered-dish dinner was served cafeteria style by the XYLS. Ice cream and cold pop, brought to the picnic by John Snyder, WØWRT, and Harold McClenahan, WAØDGA, set off the outdoor meal.

Cecil DeWitt, WØRMB, conducted the games for kids and adults in traditional style. As you can see by the pictures, everyone enjoyed the races, forward (Picture #6) as well as backward (Picture #7). The Coke drinking contest was a success (Picture #8) and, incidentally, Pat Connell, WNØPMW, won another giant bottle of Coke. Even a surprise dressing contest was held and provided fun for all who watched (Picture #9). Sharon Heinz, XYL of WAØEEM, won the

ladies' shoe kicking contest (Picture #10). Dan Fahrlander, WØLGT, outdistanced the other men with his shoe kick (Picture #11). Members of the XYLS made beautiful hats from scraps they had to find (Picture #12); by popular applause, the winner, Sharlene Anderson, XYL of KØDNE, received a transistor push-pull amplifier, presented by Cecil, "Radio's Midget Brain!" (Picture #13). Everyone really got "splashed up" and wondered where the "yellow" went with the egg toss (Picture #14). Quite a few lucky Hams went home with door prizes, and all went home with their "tummies" full!

Very special award plaques were presented to Eva McClenahan, XYL of WAØDGA, and to Doris Moses, XYL of WAØGED, by President Erv Heinz, WAØEEM, for their outstanding effort during 1967 Centennial Field Day (Picture #15).

Sincere thanks to all who worked to make our 1967 Hamfest a success! (Pics start on opposite page.)

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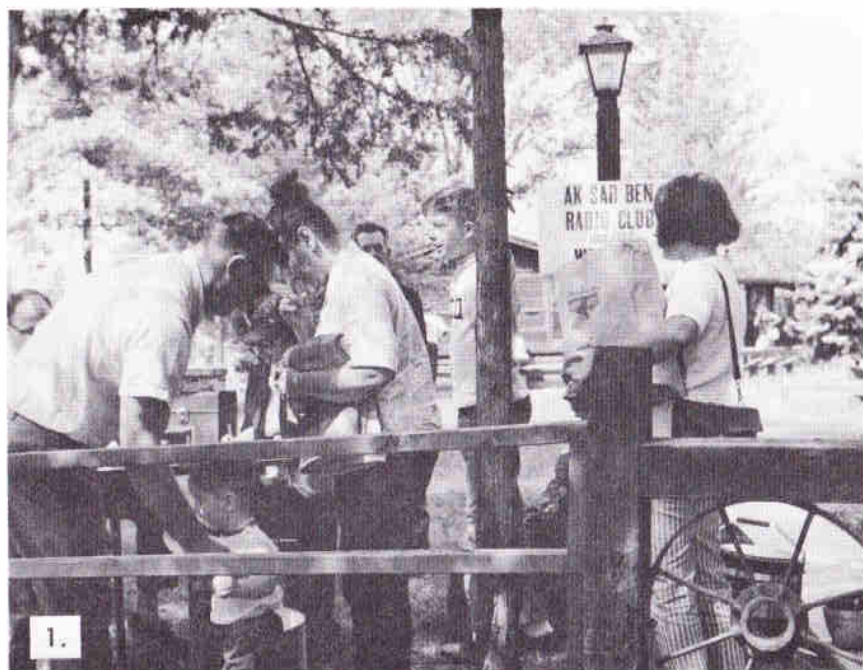
### FOR SALE

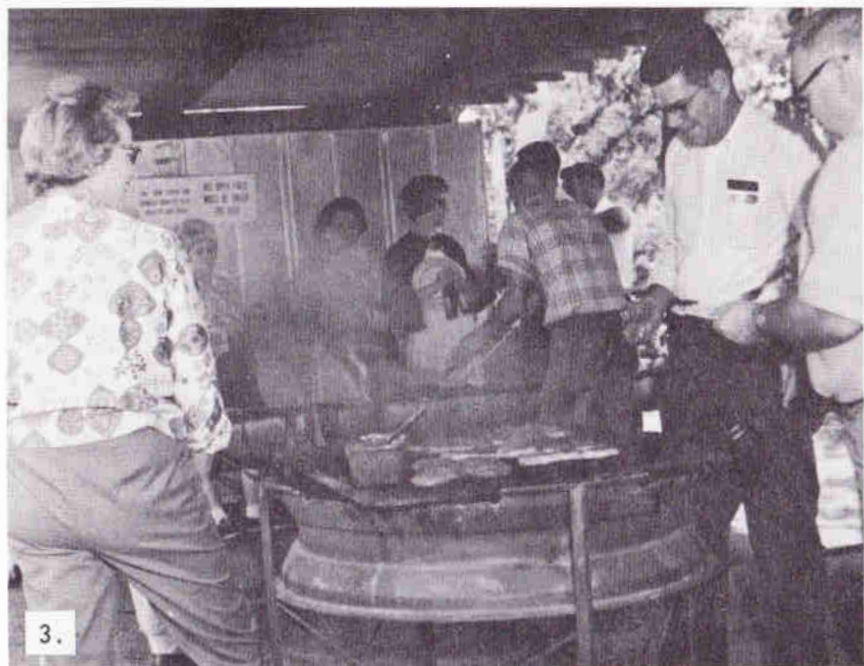
Gonset 201 Linear (A-1 condition)  
Hornet Tri-Beam  
TCS 13 Transmitter, Receiver  
AC/DC (new)  
Make Offer  
HRO-5 All coils, etc.

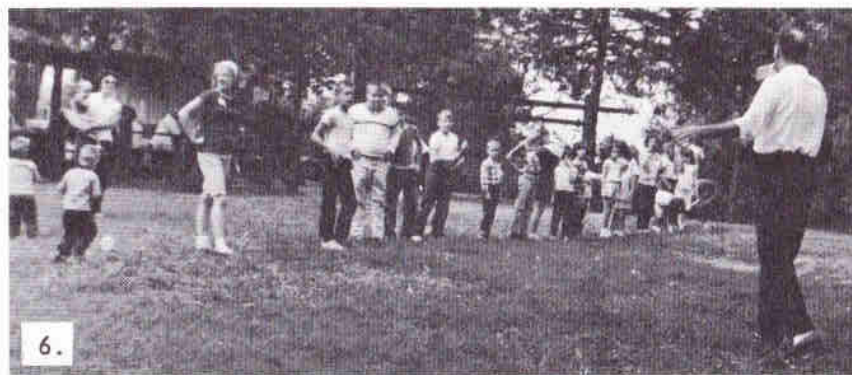
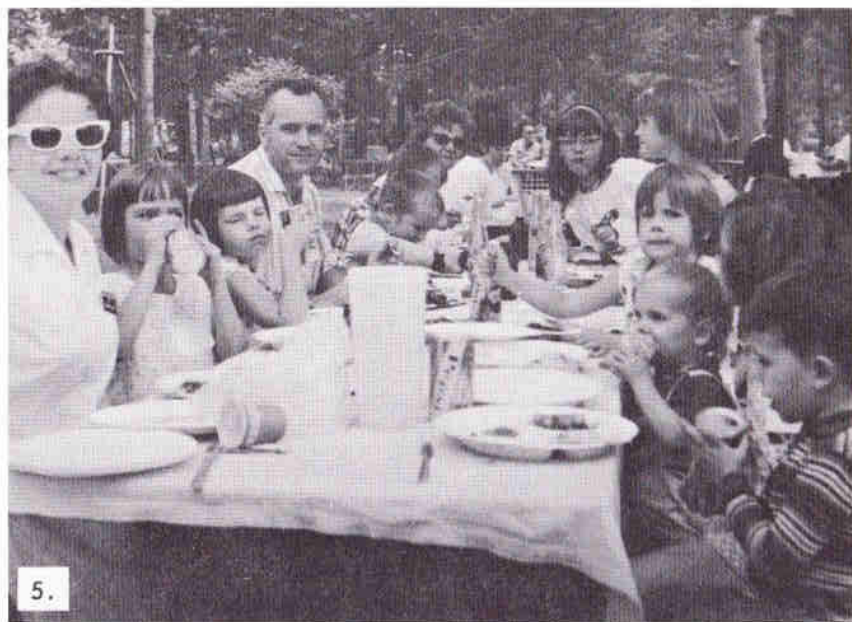
Bob Miller, KØZLY  
553-7005 - Days  
556-3478 - Nites

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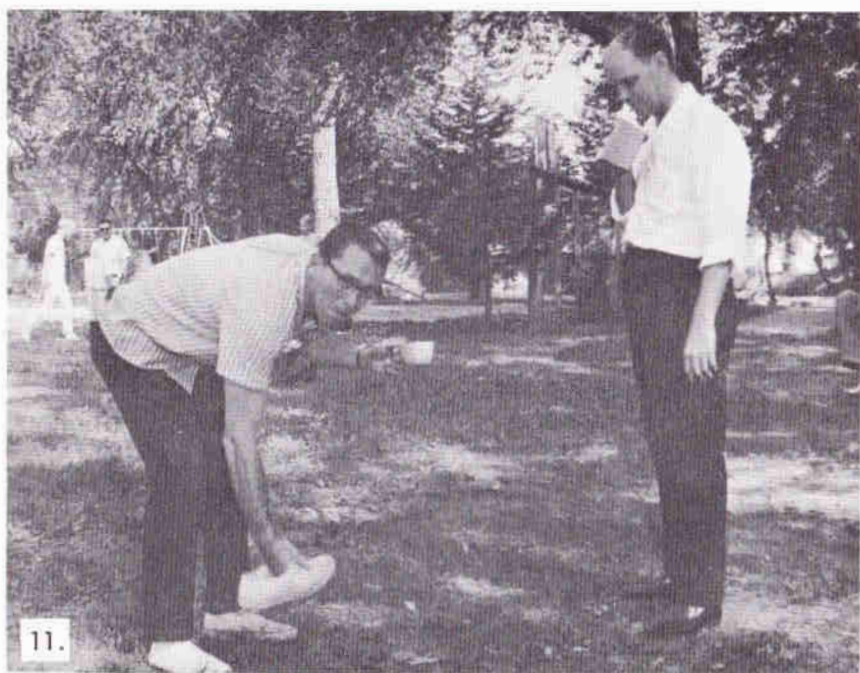
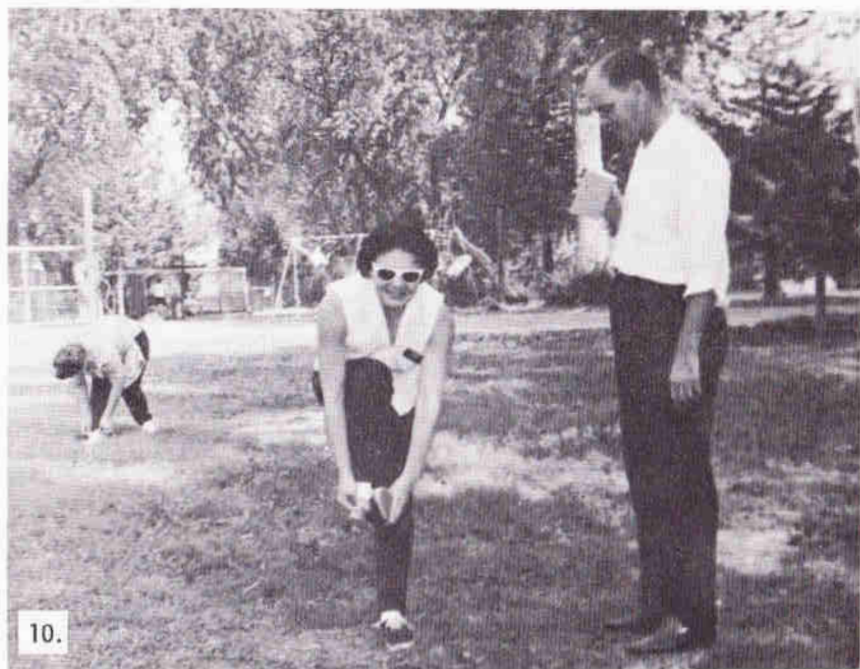


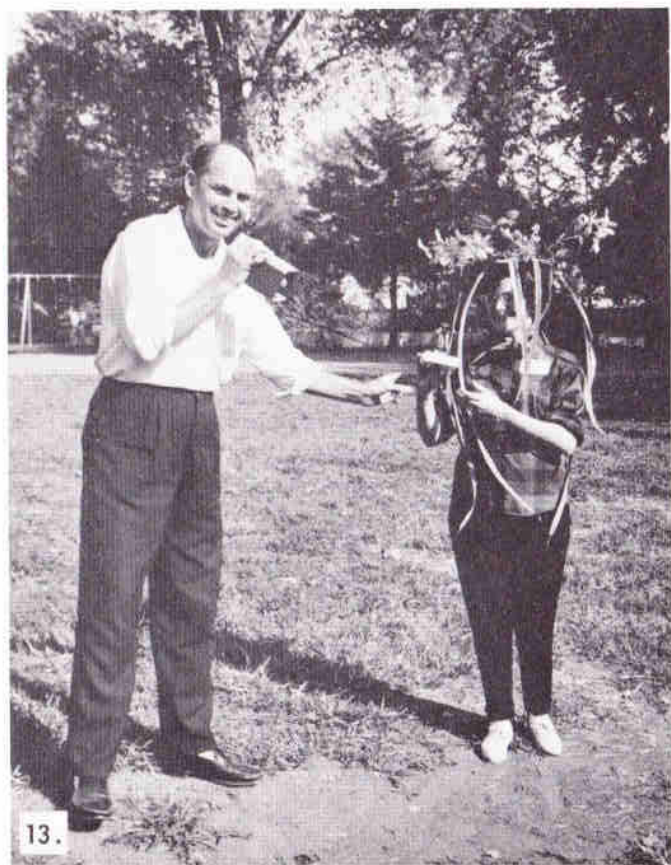
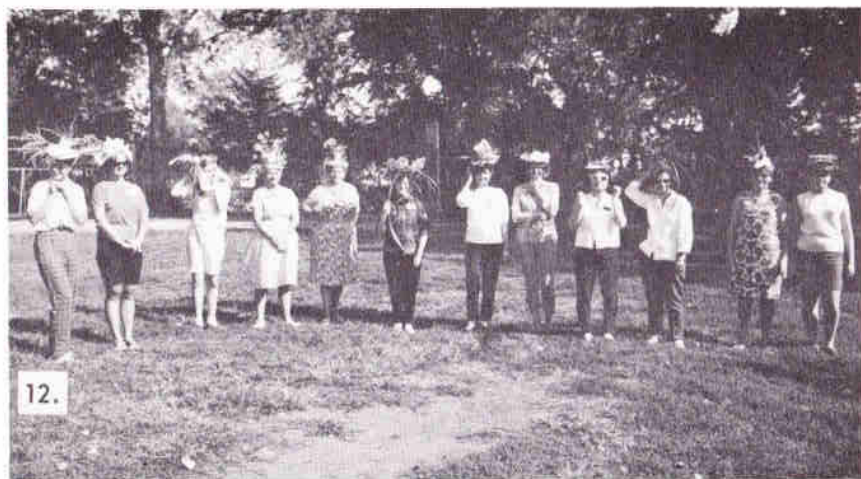
















Dear Dick et all -

A great Ham Hum again. Can't wait to try the Bow Tie Dipole - hope can do before snow flies. Sure sorry to miss the steak fry but air-lines could not see it my way.

73,

Sumner, WØGQ

Lou, WØVLI, was at Eppley Field to meet the plane from Cedar Rapids in case the standby for WØGQ did put him into Omaha.

Incidentally, Sum, who is currently Director of the Midwest Division, ARRL, is a candidate for reelection. Sum has been in amateur radio since 1926 and is a past president of the Cedar Valley Amateur Radio Club. He had been Vice-Director of the Midwest Division for five terms, and became Director in May 1966 when the then Director Robert Denniston, WØNWX, vacated to accept the Presidency of ARRL.

Andy, KØNL, who is a candidate for Vice-Director of the Midwest Division, ARRL, also planned to attend our Hamfest but last minute obligations prevented him from doing so. Andy started in amateur radio in 1929. He had his beginnings in Kansas, but World War II took him to the Navy and the cryptographic section of the Navy Department in Washington. Upon leaving the Navy in 1946 he started in Washington with the Department of State as a professional cryptographer until his retirement in 1965. He moved back to Kansas in 1966 where he now has all of his time available for amateur radio. This editor has known him for a number

of years as the editor of *Auto-Call* published by the Foundation for Amateur Radio, Inc. in Washington, D. C. He was also one of the organizers of Amateur Radio News Service which has for its main purpose the helping of editors of the various radio club publications such as *Ham Hum*.

Having a personal acquaintance with both of these gentlemen, we recommend them to you as being capable of handling the jobs for which they are candidates.

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ARRL Bulletin NR 131 re VE/W Contest received too late for insertion in Ham Hum.

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**OFFICIAL BULLETIN NR 132  
FROM ARRL HEADQUARTERS NEW-  
INGTON CONN SEPTEMBER 7  
1967 TO ALL RADIO AMATEURS BT**

United States amateurs are reminded that the rules changes implementing incentive licensing go into effect November 22, 1967. Applications for two letter calls by Extra Class licensees with 25 years service and applications for the Advanced Class license examination may be made after above date. Please note that the first group of special frequency privileges will not become effective until November 22, 1968. AR

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Sept. 23, 1967

Ham Hum  
Ak-Sar-Ben Radio Club, Inc.  
Omaha, Nebr. 68101

Guess I have been out of touch with any activity on the air the last month; did stop in at Ainsworth and visit with George, KØUWK. He runs a fine station, is putting in a mobile rig, and practicing his CW too, for the new licensing program.

If anyone just thinks that buying or building an Electronic Keyer is getting a magic box that will make perfect code for him, I have news for that guy! The vicious little box will make your fist sound like a nervous novice, will repeat every sloppy swing you have thought was CW. It will put your fist in a straitjacket and mold your sending to some sort of standard. You can take "Learning the Radiotelegraph Code" and begin at the beginning, slow, and learn all over to send CW, and hope that someday, on the air, someone will say, "Smile, you have a perfect fist."

That paddle used with a keyer is the whole thing; at 3 to 8 wmp you can beat out CW with almost any kind of homemade paddle, but from 12 wpm up, the tension on your fist will cause fatigue, quick. Or if you have a paddle built from a bug, a regular keyer paddle that you have 'opened up,' you will find as you gain control and speed up that you are tightening up the contacts unbelievably close. Perhaps it

would be just as well to start that way in the beginning, except that you do have to learn to eliminate your tendency to 'beat the bug' or pound the key. Gentle does it. Now you are running off good solid CW at about your best speed and you try it on the air. What happens now should not happen to a dog, you flub it, you cannot even send your own call. When you threw the switch and checked into the net, all your old easygoing, sloppy swings came back!

Practice for the highest speed you can attain, and hold accurately for at least fifteen minutes. Now just try and slow down to five or ten or even fifteen words per minute. The greater the change to slower speed, the worse you get. But remember not everyone can take CW at twenty, or twenty-five or faster, and you are going to have to learn to handle that box at any speed the other guy can copy, so more practice to you now at varying speeds. If you think it is not worth the effort, remember you are not sending CW for your own enjoyment; it is the receiving CW that is enjoyable, so work hard and try to make the other guy happy. You better had, or he won't talk to you anymore.

Dayton, WØVEA

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If you want your children to look up to you, walk in and turn off the TV set.

de Fresno Skip

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## ARRL REPORT

ASSISTANT DIRECTOR

Atlantic Division, ARRL

E. S. VanDeusen, W3ECP

3711 McKinley St., NW

WASHINGTON, D.C. 20015

Reference the Election Notice which appears on page 65 of the August issue of QST announcing the election of Director and Vice-Director of the Atlantic Division for the two-year term beginning January 1, 1968, it is known that valid petitions have been submitted to League Headquarters nominating Gil Crossley, W3YA, the current Director, for re-election to another term, and Mac McConaghy, W3EPC, for election as Vice-Director. It is also understood that a valid petition for the re-election of Jess Bieberman, W3KT, as Vice-Director has been submitted. Atlantic Division members should not fail to vote for their choice when the ballots are received, probably some time in October. Petitions must be in Headquarters not later than September 20, and it takes a little time to send out the ballots. The low percentage of members who vote in these elections has been the subject of some pertinent comment in the past; let's turn in a 100% return of ballots in this one!

Effective October 1, 1967, the League will start making service charges for the issuance of WAS and DXCC awards to Canadian and U.S. amateurs who are not members of the League. The fees will be \$4

for DXCC, whether the regular certificate or the special phone award; \$1 for DXCC endorsement; and \$2 for WAS. This is in accord with action of the Directors.

Effective December 1, 1967 the qualifications for election to the post of Section Communications Manager will be changed to require a candidate to hold a Conditional Class or higher license.

League General Counsel Booth has filed comments on behalf of the League with FCC in opposition to certain features of changes proposed in the Rules covering the RACES operations, Sections 97.193 and 97.195 which would provide for the use of F4 and A4 facsimile modes of emission. The basic reason for opposition is that opening up the rules in this manner would erode the basic concept of RACES as an amateur effort and set up a non-amateur communications service in the amateur bands.

The Amateur Call Book, beginning with the Autumn 1967 edition, will indicate the class of license held by each amateur. Also the price of the Call Book is to be raised one dollar.

The FCC has dropped a part of the proposal contained in Docket 16474 issued in early 1966, which would have changed Section 17.3 of the FCC Rules pertaining to antennas in such a way as to be a hardship on amateurs, requiring a survey by a registered engineer in connection with any erection or modification of antennas within about 7½ miles of any airport. When adopted, the



changes may, however, contain some requirements which amateurs should be aware of. If a proposed antenna is more than 20 feet above ground or a natural formation or an existing

man-made structure, it may be necessary to file a Form 714 certifying that FAA has been notified, or claim exemption on the basis that shielding by existing structure or natural terrain makes it obvious that no hazard exists to air navigation.

The general subject of "phone patches" is being studied by the FCC in connection with a suit in Texas by the manufacturer of an interconnection device which the phone company has ruled in violation of its rules. The matter is not final, but the FCC has issued a proposed finding which might be interpreted as in favor of such devices "for any purpose.....not publicly detrimental."

The balance sheet of the League for the three months ending June 30, 1967, shows a net loss of about \$23,700 which, after deducting expenses authorized by the Board of Directors becomes about \$42,000. ARRL is in no different situation than many other organizations which are facing serious financial difficulties resulting from loss of or failure to build membership, skyrocketing costs of all sorts and the general apathy of the majority of the population towards anything except their own little, closely circumscribed, personal interests. Maybe the Old Grouch will expand on that theme some day soon; it's worth exploring!

As the result of a study directed by the Board of Directors last May, General Manager Huntoon has studied the desirability of installing an automatic data processing system at League Headquarters. He reports to the Directors now that, after weighing the advantages and disadvantages against each other, he does not believe that the League is ready as yet to undertake such an installation. The study will continue and any changes in the situation will be reported as they occur.

73, Van, W3ECP

Assistant Director  
de Auto-Call

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Editor, Ham Hum

Responding to your request for info on MARS: I am a member of Army MARS. Clarence Heiden, KØDGW, Benedict, Nebraska is the State Director. We have practice nets on Monday, Wednesday and Friday. We also have nets with Hq. 5th Army where we receive messages from overseas. Clarence can give you more details if you should want them. Personally, I check into the 5th Army Net on Tuesday and Thursday. I have received hundreds of messages, but wish there was even more traffic. Enjoy it very much.

73,  
Harv

Harvey Headley, KØBPW  
3330 Monroe Street  
Omaha, Nebr. 68107

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## P.E.P. INTAKE AND ALL THAT JAZZ!

From Florida Skip, March 1967  
by Jack Wainwright, W4IEH

Peak Envelope Power (P.E.P.) is a method for rating linear amplifier power capability. Amateur SSB transmitters are rated by the manufacturers in P.E.P. input for reason of FCC requirements. Commercial SSB transmitters are normally rated in P.E.P. output as determined by the two tone test method. The methods used by manufacturers to arrive at P.E.P. input figures for amateur transmitters are seldom mentioned.

P.E.P. input is defined as the D.C. input at the modulation envelope peak, and may be 1.4 to 2 or more times the P.E.P. output power. Factors contributing to the P.E.P. output figure are: Plate Efficiency Distortion, Plate Dissipation of tube type, loading and power supply capability. Distortion is the prime limiting factor. To measure precisely the P.E.P. input to a given amplifier at a given moment is a very difficult thing to accomplish. As a result, various methods of approximation have been devised. The assumed method used by manufacturers to establish amplifier capability is the two tone test, which measures the peak envelope current without distortion, (flat topping) with unlimited driving power, times the plate voltage.

A method of P.E.P. input approximation and linear amplifier

tune-up procedure without a scope, which is fairly accurate, has been suggested in a past QST article by H. F. Wright, Jr. (W1PNB). It states, as an example, if your linear amplifier is rated at a plate voltage of 800 and a maximum signal current of 400 MA, (NOTE: Manufacturers' ratings are for single steady signal, not speech) the procedure for tune-up without a scope and P.E.P. approximation is as follows:

1. Insert a small amount of carrier from the exciter and tune the grid and plate circuits to resonance as indicated on an output indicator in the antenna feed line.

2. Adjust the coupling to the antenna feed line (usually a pi-net output loading capacitor) for maximum output for a given plate current at resonance, in this case 400 MA. If the D.C. current is less than 400 MA, the linear drive is insufficient or the antenna not matched as will be indicated by a SWR bridge.

3. Vary the amount of carrier insertion and observe output indicator, note the point at which increasing the carrier no longer results in rapid increase in output. This should be close to 400 MA. Use this figure to multiply by the plate voltage. This will result in the maximum signal linear power available of P.E.P. input. In this case, 320 watts.

4. Remove the carrier, adjust speech gain for a maximum speech peak of 200 MA on the Plate MA Meter. This will result in a speech P.E.P. input of 320 watts as above and allows for meter lag.

5. The above method should be used with caution, making readings rapidly and not extending time of heavy carrier insertion, dissipation of tubes. A scope should be used if available.

It is hoped that this will clear up some of the confusion on P.E.P. ratings and eliminate many misconceptions as to its meaning and applications. (From BARC Bulletin de Pack Rats Cheese Bits

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**OFFICIAL BULLETIN NR 133  
FROM ARRL HEADQUARTERS NEW-  
INGTON CONN SEPTEMBER 14  
1967 TO ALL RADIO AMATEURS BT**

With the approach of the Fall season, many clubs renew scheduled monthly activity and training classes. All ARRL affiliated club groups are reminded of the extensive ARRL training aids library which continues to make available technical films, film strips, slide collections, tapes and quizzes. The demand is brisk and ARRL affiliated club officers should request items well in advance of the date required. Full information is available from the ARRL Communications Department, 225 Main Street, Newington, Connecticut 06111 AR

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Every man needs a wife--because many things go wrong that can't be blamed on the government.

The Tennessee Ham

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## CRITICISM

From Florida Skip, March 1967

Most of us respect ourselves more than does anyone else. In fact, we respect ourselves so much we can't see any need for a change. What we probably need most of all are a few rough treatments which will show us what duds we really are.

Generally, criticism hurts and angers. Whether it is constructive or not, some people feel it isn't necessary; it is not fair and they are confident they can do just as well without it. But how wrong they are. They need criticism; we all need criticism. Even when it is unearned, it is a privilege and an opportunity. Otherwise, how could we know ourselves or correct our faults. (Working With People)

(Ed Note: It all depends on the tone of your voice whether or not criticism will hurt or anger. A gentle voice will result in respectful listening. An accusing voice will result in anger and argument.)

de Pack Rats Cheese Bits

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**Sent in by a reader:**

Some people are like fences. They run around a lot without getting anywhere at all.

By the time a man finds greener pastures, he can't climb the fence.

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## EMILY POST ON HAM RADIO

Good manners on the air are as important as they are in any social relationship. Be as pleasant to a guest who comes into your home via ham radio as you would if he came into your home through the door.

Don't answer a directional call unless it is in your direction. Answering a directional CQ not in your direction or answering a call to another station is a bit like answering your neighbor's doorbell or phone. Don't get into a QST that sounds like it is personal and if you get involved in one where the other stations have things to discuss that are of a personal nature, read the mail until invited to speak and then keep it brief. In a round table where mobiles are involved, keep each transmission short, as the mobiles may be reaching their destination and may want to check out. Often a mobile is forced to turn his rig off without signing off because the other stations will not give him a chance.

Monologues are rarely as interesting as short comments made back and forth a bit like an off the air conversation. Also do not tune up on a frequency being used.

The Golden Rule: "Do unto others as you would have others do unto you" applies to all facets of life - ham radio included.

de Fresno Skip

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It doesn't take a big spender to put money into circulation these days.

de ARNS Bulletin

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## LET US STRENGTHEN THE AK-SAR-BEN RADIO CLUB!

Don't dodge thankless jobs that must be done--The success of any Ham Club depends largely on the "behind the scenes" work of individuals who seldom get recognition or acclaim. The success of our "Ham-Fest" last month was due to the efforts of your fellow Hams working together and made for a very enjoyable event. It took a lot of effort and behind the scene work to plan, organize and follow-through to tie all the activities together. Your Board of Directors extends "TNX" to all of you who gave a helping hand and attended the Ham-Fest. Every effort will be made to foster and promote an annual occurrence of this event on the calendar of your Ak-Sar-Ben Radio Club.

Erv Heinz, WAØEEM  
President

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If man is only a little lower than the angels, then the heavenly choir must get off key now and then.

de ARNS Bulletin

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### FOR SALE

HW-12 with Dynalb Conversion for  
20 and 40 meters  
HP-13 DC Power Supply  
HP-23 AC Power Supply  
Webster Mobile Antenna for 80 meters  
\$150.00 takes all

Joe Roberts, KØKEO  
2911 Ellison Avenue  
Omaha, Nebraska 68111

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OFFICIAL BULLETIN NR 134  
FROM ARRL HEADQUARTERS  
NEWINGTON CONN SEPTEMBER  
21, 1967 TO ALL RADIO AMA-  
TEURS  $\overline{BT}$

The annual ARRL cross indexed Net Directory is now ready for distribution, in a new convenient size. Copies are being mailed to those who have requests on file. If you have previously made such a request, and have received an acknowledgement card, please do not request another Net Directory. All others wanting a copy should mail or radio a request to the ARRL Communications Department, 225 Main Street, Newington, Connecticut 06111. Be sure to include your zip code with your return address. Please mention the call of the station transmitting this bulletin and the frequency you copied  $\overline{AR}$

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OFFICIAL BULLETIN NR 135  
FROM ARRL HEADQUARTERS  
NEWINGTON CONN SEPTEMBER 28  
1967 TO ALL RADIO AMATEURS  $\overline{BT}$

The United States has concluded a reciprocal operating agreement with Venezuela, effective October 3. Amateurs of one country visiting or residing in the other may obtain permission to operate their own amateur stations there. This 30th reciprocal agreement, along with Trinidad, supplements the list appearing on page 70 of August QST  $\overline{AR}$

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OFFICIAL BULLETIN NR 136  
FROM ARRL HEADQUARTERS  
NEWINGTON CONN SEPTEMBER 28  
1967 TO ALL RADIO AMATEURS  $\overline{BT}$

Following up the FCC Report and Order in Docket 15928, the Commission has already begun to issue Novice licenses with a two year term. Responding to a League request, FCC also has corrected the new rules for two letter calls. Extra class licensees who held either a regular combination license or an operator only license at least 25 years ago are equally eligible; effective Nov. 22, 1967  $\overline{AR}$

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In case you're one of those who think we're getting too much government, just imagine what it would be like if we were ever to get as much as we're paying for.

The Tennessee Ham

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The good old days were when your kids nicked and dined you to death but today you're overdrawn and quartered.

de ARNS Bulletin

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"Here's my bill," said the lawyer. "Please pay \$300 now and \$75 a month thereafter."

"Sounds like buying a car," said the client.

"I am," returned the attorney.

de Fresno Skip

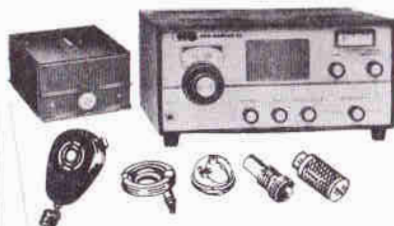
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# "Duo-Bander 84"

80-40 Meter  
SSB Transceiver  
Ham Net \$159<sup>95</sup>

WRL CHARG-A-PLAN \$8 Monthly

## A Complete 80-40 Meter MOBILE PACKAGE!



Includes 1 ea.: Duo-Bander 84, DC384 Power Supply, one Band-spanner Antenna, BDYF Mount, 350C mic, Mic. Plug, PL 259 Plug, UG176/U Reducer and 25' RG58/U coax Cable. All supply cables are included.

ORDER: ZZA-103 package (\$15 monthly)...Regularly \$299.95 WITH BONUS COUPON...\$279.95. (\$14 monthly)

## A Complete 80-40 Meter FIXED STATION PACKAGE!

Includes 1 ea.: Duo-Bander 84, AC48 250 watt supply, 80/40 Duo-Doublet Antenna kit, 350C mic., Mic. Plug, PL259 Plug, UG-176/U Reducer and 100 ft. RG58/U coax cable.

ORDER: ZZA-104 Package (\$11 monthly)...Regularly \$225.00 WITH BONUS COUPON...\$205.00 (\$10 monthly)

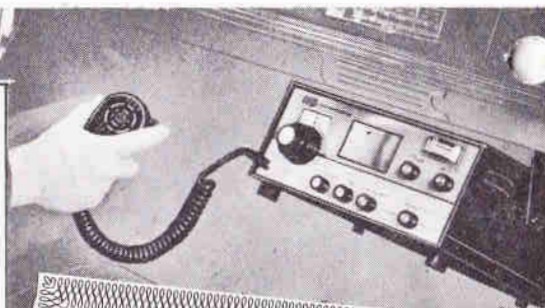
ORDER: ZZA-105 Package (same as above with 300 watt AC supply)...Regularly \$255.00 WITH BONUS COUPON \$235.00 (\$12 monthly)

## Look at these DUO-BANDER 84 FEATURES!

- 300 watts PEP-SSB • Rugged-Reliable Printed Circuitry • 2k-Hz Dial Calibration • Dual-Speed Vernier VFO tuning • E-Z One-Knob Tune-Up - "Just Peak Output" • Built-in Speaker • Mobile Bracket supplied • Combination "S" and Output meter • Crystal Lattice Filter.

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