

HAM HUN

AK-SAR-BEN
RADIO CLUB
INC.

WØEQU

June 1958

P.O. 626

Omaha 1, Nebr.

Vol. III No. 6



REMEMBER FIELD DAY JUNE 28,29

Ham Hum

Published by
AK-SAR-BEN RADIO CLUB INC.
Post Office Box 626
Omaha 1, Nebraska

HAM HUM is the official organ of the Ak-Sar-Ben Radio Club of Omaha, Nebraska, Mailed monthly to all members and to others upon request. News and information of interest to amateur radio is gladly

accepted. All items must be received at least two weeks prior to the second Friday of each month for inclusion in the current month issue. Submit all correspondence to P.O. Box 626, Omaha, Nebr.

AK-SAR-BEN RADIO CLUB, INC.

Full permission is given for quoting from Ham Hum with credit line.

OFFICERS

Ed Gutmann, W0CQX, President
Jerry Armstrong, W0NKG, Vice President
Bob Sleyster, W0OSE, Treasurer
Dave Hollander, W0CJW, Secretary
Curt Hicks, K0AMM, Past President

BOARD OF TRUSTEES

Bob Sleyster, W0OSE
Dave Hollander, W0CJW
Elmer Burt, K0DFJ
Rollie Johnson, W0SPQ
Al McMillan, W0JJK
Cecil DeWitt, W0RMB
Windy Larsen, W0NPA
Damon Nuckols, W0UIO

PROGRAM

Jerry Armstrong, W0NKG
Al McMillan, W0JJK
Dick Eilers, W0YZV

REFRESHMENTS

Cecil DeWitt, W0RMB
Elmer Burt, K0DFJ
Ron Novotny, K0ENF
Dick Eilers, W0YZV
Jerry Armstrong, W0NKG

HAM HUM

Al McMillan, W0JJK
Dick Eilers, W0YZV

TECHNICAL

Don Grenzeman, W0TRK
Milton Krogstad, W0FKG
Larry Caccamo, W0NMN

COMMITTEES

MEMBERSHIP
Damon Nuckols, W0UIO
Rolly Johnson, W0SPQ

PUBLICITY

Dave Hollander, W0CJW
John Biodrowski, W0MYC

MOBILE

Wendell Larsen, W0NPA

PUBLIC RELATIONS

Hugh Tinley, W0GHK
Max McKinney, W0YVV

CIVIL DEFENSE

Cecil DeWitt, W0RMB
Jerry Armstrong, W0NKG
Erich Bahr, W0HRK

NOVICE,

Rolly Johnson, W0SPQ
Kenneth Horton, K0HSL

FIELD DAY

Cecil DeWitt, W0RMB
Ed Donze, W0YEV
Frank Parsons, W0EMS

VHF

John Snyder, W0WRT
Lou Cutler, W0VLI
Frank Parsons, W0MYO

Ak-Sar-Ben Radio Club memberships are open to all persons having an interest in amateur radio and its activities. Dues are 50¢ per month or \$5.00 per year when paid in advance. Students

rate is 25¢ per month or \$2.50 per year. Initiation fee (). Special rate for OM-XYL, \$6.50 payable annually. Meetings are held on the second Friday of each month.

SINGLE SIDEBAND

by Harlan Bercovici KOBHT

This month Ham Hum starts a new series on SSB. This series will cover the principles and operation of SSB, and will conclude with complete information on how to build both a single band, and a band-switching, SSB exciter. Single sideband has definite advantages over A.M., but since SSB is an altered form of A.M., we must understand how A.M. works before we can understand how SSB functions.

PART 1--How an A.M. Signal is Generated

Basic radio theory says that the terms mix, modulate, convert, and heterodyne all mean the same thing. When a radio frequency amplifier is modulated, there are two signal inputs and four signals in the output circuit. Again, basic theory tells us that when modulation occurs, the products of that modulation will be the two original frequencies, plus the SUM and DIFFERENCE frequencies. The sum and difference frequencies, if a human voice signal or music signal, is used, are called the sidebands. Consider this example: a 3900 kc.

F. signal is applied to the grid of the tube, the final amplifier tube that is, and a 3 kc. (3000 cps) audio signal is applied to the cathode, grid,

screen or plate, of the same tube. It doesn't make any difference which element we choose to apply the audio signal to, the same job will be done. The output of the circuit will contain four signals, namely 3900 kc., 3903 kc., and 3897 kc. The first two of these signals are of course our original signals, and the last two are the sum and difference frequencies. Since there is a tuned circuit, tuned to the 3900 kc. R.F. signal, a load impedance is presented to this signal. Also, since the percentage difference between the original R.F. signal, or carrier, and the sum and difference signals, or sidebands, is very small, a load impedance is also presented to the sideband signals. But the impedance presented to the 3 kc. audio signal is almost zero, because of the almost 100% difference in frequency, so that the audio signal output has to go back to the power supply, to be bypassed in the filter condenser. By now it should be clear that the "modulator" in an A.M. rig does NOT modulate. It only supplies the audio power required in the modulation process. The final R.F. amplifier is the actual modulator, or mixer. This stage accomplishes the actual modulation. The foregoing example

holds for any combination of R.F. carrier and audio frequencies, and for any number of audio frequencies at the same time. This is how we get voice modulation.

We have just discussed how an A.M. signal is generated. It can be observed that while the audio modulating frequency in the example was 3 kc., the total bandwidth of the output signal was 3897 to 3903 kc., or 6 kc. Therefore, if the frequency response of the speech amplifier is limited to 3000 cycles, as is common Ham practice today, the bandwidth will be 6 kc. It now becomes evident that one sideband duplicates the other. We can remove one sideband and still transmit the same intelligence in the remaining sideband. In view of our overcrowded bands, this only makes sense. And what does the carrier do? We have to have it to accomplish the modulation in the first place. We also have to have it to beat with the sidebands in the detection process in the receiver. But once the modulated signal has been generated the carrier is no longer needed at the transmitting end. And the receiver's BFO can easily be used as a substitute at the receiving end. What else does the carrier do? It holds up the pointer on the "S" meter, and it creates heterodyne interference to other

stations. We can obviously get along without the interference, and not having the "S" meter stay up while the other guy's signal is on is no great loss. So we can do without the carrier to. If the carrier and one sideband are eliminated all that is left is the one remaining sideband. SSB can provide a system power gain over A.M. Then too, all the transmitted power in SSB is full communications power. Nothing is wasted on the carrier, or blowing the whistle, as the expression goes.

NEXT MONTH: The relative effectiveness and efficiencies of A.M. and SSB.

SIX METER AWARD

Those of you who are active on six meters and would like to acquire a little wall-paper can try to obtain the Nishna Valley six meter net certificate. The requirements are to work six members of the Nishna Valley net. Some of the members of this net are K0CBC, K0MDT, K0DVL, K0OVO, K0JHE, W0UIZ, K0LXI and W0DJN. When you work six of the above stations or others in this net, just send along a list of those contacted to K0DVL for your certificate. W0Y, Dick, in Omaha has this certificate, having worked eight of the net members.

NEW EQUIPMENT

The DSB-100 transmitter is a new product manufactured by WRL Electronics, Inc. of Council Bluffs, Iowa. Briefly, it is a transmitter which contains three modes of transmission, making it suitable for use by general class and novice class operators alike. The three modes are AM, CW and Double Side Band. It is rated at 100 watts PEP input on DSB, 50 watts CW and 40 watts AM. On DSB or AM the unit features a highly effective clipper filter circuit to add punch to the audio. Standard amateur bands crystals for 80 or 40 meters are used, or an external VFO supplying the usual amateur frequencies. As an AM or CW transmitter this is not unusual; however, where side band operation is concerned a special frequency VFO, mixing or heterodyning and some other complications are minimized by the use of the balance modulator circuitry which does allow straight through operation and therefore crystals or VFO an amateur may presently own his own. While there is certainly some range in agreement as to the most effective modes in transmission, we do feel that suppressed carrier operation is a decided advantage in many respects. This to our knowledge is the first commercially made

unit that does offer suppressed carrier operation in a complete self-contained transmitter near \$100.00. We understand the factory wired price will be \$139.95. The unit features 110 volt AC power supply built in and an external socket for connection of a matching VOX and QT combination for those who desire voice control and anti-trip features. Pi network output is incorporated matching loads of approximately 40 to 100 ohms. Straight forward circuitry is used throughout and actually, other than the balanced modulator circuit, the entire circuitry is much the same as you would find in any amateur band transmitter, so we believe the circuitry will not be unfamiliar to most.

JUNE PROGRAM

Part of the program for our June meeting will be a talk and demonstration with equipment on the new DSB-100 transmitter. The DSB-100 is a new item recently offered to the market of amateur radio equipment and details on it will be found elsewhere in this issue. The talk on DSB will be by Alan McMillan, WØJJK, representing WRL Electronics, Inc. of Council Bluffs, Iowa. We will also have a movie followed by our usual raffle, coffee and rag chews.

THOUGHTS OF AN XYL

I am the wife of a ham. To the uninitiated that means I have a hubby engaged in quite a romantic hobby - something akin to yachting or raising lions or being an undercover agent for the F.B.I. But to those in the know, I am the hobby, and hubby is married to his rig - and always will be. At first, I was completely enthralled by his equipment; his first out-of-state contact thrilled me as much as it did him. But after the newness wore off, I discovered that underneath he was just a human male with a disproportionate interest in electronics. I am now adjusted to my role in his life - and happy to be his hobby. And I'll admit every time there is an opening, no matter what I am doing, my ears are glued to that rig. Even at 2 AM I'm hoping he will get that new state he hears.

For a long long time while I was feeling sorry for myself, I thought I was the only wife so discriminated against. Now I know that the whole first paragraph applies to every XYL. This brings me to the point of my writing. Cheer up, XYL's! Let's either form a union to regulate hamming, or encourage husbands to make WAS, WAC, BPL, DXCC, Rag Chewers (who couldn't qualify for that around

here), and get some recognition, OR get on the air ourselves. That last suggestion has the best possibilities - think of an opening at mealtime, the wife on the air: husband couldn't be late for supper; he'd have to get it himself, along with some of his own medicine. Besides, there aren't enough female hams in this area.

I have just as much difficulty as the next wife getting things done around the house. I got married with that silly romantic notion that husbands not only supported their families, but also did the heavier work, such as changing storms and screens, cutting the lawn and bushes, cleaning the basement and garage, etc. Now I clean around his stuff in the basement and garage, we have a power mower so the lawn won't take so long - and he has an emergency motor in case of a power failure during an aurora, and as soon as we have enough money saved - and he doesn't need some new equipment, we will invest in combination windows. I clip the bushes. So hams, take a word of advice. If you are suffering with an impatient XYL, if you have trouble keeping her in good humor, don't get off the air entirely. Compromise. Take time out to enjoy your hobby. And help her once in a while.

PHONE PATCHES.

Many of us wonder what goes on inside of a phone-patch and what goes into the construction and design. A patch can be constructed from the simplest design and the minimum of parts which would consist of a line transformer. (See fig. 1). This forms the basic circuit of phone patch as installed between the telephone line and speech amplifier.

Our next step is to facilitate switching from receive to transmit. (See fig. 2). Here we have the change-over switching arrangement to properly receive and transmit the necessary intelligence. The arrows indicate the direction of speech transmission. Switch 1 is shown in the normal "receive" position. The receiver audio output is directly into the telephone line. In the "transmit" position, the change-over places the telephone line into the patch transformer circuit and any modulated currents in the telephone line are fed by the transformer to the speech amplifier. Switch 1 may be either a manually operated (preferred) toggle switch or by incorporating a relay (Ryl) can be operated from a pushbutton. The relay (yl) coil is shown here for demonstrative purposes. However, for simplicity and with a view towards economy this would be impracticable. This

relay was only shown here to indicate the various means of actuating the patch that are possible, in fact, so numerous we feel that you should use your own imagination and creative ability.

Up to this point we have covered only the audio portion of the patch. Now we must consider means for actuating the transmitter. Additional facilities must be added to the now growing number of contact arrangements to our key. In the following (See fig. 3) in addition to the power circuit, a few necessary components such as RF chokes and RF by-pass and coupling capacitors are indicated to insulate the audio from mechanical grounds or short circuits. C1, C2, C3, C4 (.05 mfd) should be sufficiently large to pass the audio, however, this capacity is not critical, most junkbox condensers of large capacity will function equally as well. C5, & C6 (.005) should be relatively small since their purpose is to by-pass and filter stray RF getting by RFC1 and RFC2, (these capacitors are not too critical). These capacitors together with the two RFC's keep the RF from passing into the phone line. A relay type switch is also optional in this arrangement.

The next circuit (See fig. 4) may appear slightly off-color, however, believe it or not, will function surprisingly efficiently. No switches (other than sw 1) are needed in this arrangement for operation of the patch. Switch 1 is absolutely a necessity in any phone patch. When thru with its use, a phone patch must *always* be removed from the line, otherwise you may lose your popularity with the phone company. Back to our operations. First it is correct to assume that during the transmitting period, your receiver is normally muted or disabled, therefore facilities to remove the receiver from the phone line are unnecessary. This little item has been dispensed with. Second during the receiving period, we know the transmitter is idle and not functioning, therefore we need no switching to remove the patch from the speech amplifier circuit. So why use a complicated arrangement? A transformer, three capacitors and one DPST switch will do the job perfectly. During normal operation, with switch 1 closed, while receiving, the audio will be directed from the receiver into the phone line. While transmitting the audio picked up from the phone line will be directed the speech amplifier thru the transformer. As was mentioned before, it is naturally assumed that the transmitter, the re-

ceiver will be properly muted by the existing facilities in the normal push-to-talk circuits. The capacitors should be sufficiently large enough to pass audio impulses from receiver output to phone line and from phone line to speech amplifier and should also provide DC isolation from the various functioning units.

You will note that no transformer impedances have been given in the text. Since output impedances of receivers and input impedances to speech amplifier vary to a great extent, proper matching would be governed by the equipment itself. However, as a helpful hint, we can say that 500 ohm line to line transformers work very well. The transformer T1 in fig. 3 can be a simple output transformer removed from an ordinary broadcast receiver. The low impedance or speaker winding (3.4 ohms) will be connected towards the phone line. In this way, it represents an impulse amplifier. The high impedance windings are connected to the speech amplifier.

Diagrams 1 through 4 on Page 15

FLASH:

John Orr, WOPHW, was married on June 7.

MAY MEETING

The Club enjoyed very much its visit to Mutual and United of Omaha where they observed the 705 IBM accounting machines in action. Fortunately our visit was at the time when they are sending premium notices. During this time they run around the clock for several days due to the immense volume of premium notices sent by these companies. We were thus able to see the machines in actual operation. It was quite astounding to see machines which would print 500 lines of typewritten matter per minute. The explanation given by our guides was most complete and very interesting.

These machines are housed in a special room which is humidity controlled and temperature controlled so as to avoid any difficulties with the magnetic tape handling machines. Customarily visitors see it through the glass wall. However our members were permitted to roam about inside the room so long as they kept both hands in their pockets so as to not push any strange buttons. We do very much appreciate the hospitality extended by Mutual and United Omaha in inviting us to see these machines in operation.

TRANSMITTER HUNT

The first transmitter hunt of the year was held the Sunday after Mother's Day and was very ill attended. (Ed. note - The word is "ill" not "well.") In fact only three cars showed up at the start of the transmitter hunt.

Fellows, it's an awful lot of work setting up one of these transmitter hunts, carrying all the gear out, doing the hiding, and spending the time talking, etc. while the hunt is in progress. I am sure that Wendy will not be too disheartened as the result of this poor representation in view of the fact that this was the first hunt of the season. However, to have another one like this would be quite an indication that you just plain don't want transmitter hunts. More competition is definitely needed as WØYZV who usually comes in last came in first this time. The prize, incidentally, was donated by Ladd Electronics. Two transmitters were hidden - one on six and one on ten. YZV was receiving both, using signal strength on six and with directional equipment on ten. To quote WØYZV, "It's easy when you have no competition."

HAM HUM SUBSCRIPTIONS

In the past Ham Hum has been mailed on request to all non-members interested in receiving the official bulletin of the Ak-Sar-Ben Radio Club, Inc. We find the expense of publishing this fine paper to be increasing yearly. As in the past the Ham Hum will be mailed free of charge to all Club members and outsiders who are not nearby residents or residing in the metropolitan area of Omaha and Council Bluffs. We do, however, feel that in view of the cost that it is only fair that those in the area pay a nominal fee covering handling cost where they are not a member of the Club. This would include Pottawattamie County, Douglas County and Sarpy County. For persons residing in these areas who are not members of the Club we ask a subscription fee of \$1.00 a year. Naturally we would like to have you in the Club so that we could give you your paper free and certainly extend an invitation to all local residents to come to our next Club meeting and meet the group of amateurs who are your neighbors. We hope that we can entice you into joining our Club as we certainly feel the Club can offer a lot in the way of technical help as well as providing many good rag chews over a cup of coffee. As in the past

we extend our thanks to those who do not belong to the Club and yet have mailed us a dollar or two to help defray our cost of publishing Ham Hum. To those to whom this subscription rate applies, just drop your dollar into an envelope post-marked Ham Hum, Post Office Box 626, Omaha 1, Nebraska.

73,

The Editors

FIELD DAY 1958

By the time of our June meeting our plans for Field Day should be fairly well jelled. We urge all interested in Field Day participation to get in touch with those appointed as chairmen of Field Day operations. This year the Field Day site will be at the Latenser Estates where our Club picnic was held last year.

Our old friend, Fay Powell, W0ISV, has a new station layout consisting of a Johnson Valiant and HQ110 receiver. We know you are a camera bug, Fay, so why not send along a picture of that station layout for a feature issue of Ham Hum?

cHAMbake

The Basset Hams are planning a cHAMbake on the 15th of June. They will have mobile and fixed stations directing traffic into town. There will be tables, fireplaces and parking facilities available and plenty of ants to keep everyone company. Bring your XYL, YL, harmonics and your picnic baskets. Swimming facilities will be available. There will be pop and coffee available and the baskets will be opened about noon.

The day following the appointment of KØDBU as one of our TVI committee, we received the following in the mail on a postcard: "Interference from Ham operator KØDBU - Calling C.Q. 10."

Be sure and note the interesting editorial in the June, 1958 QST concerning frequency allocation of amateur bands. It appears the amateurs will not lose any bands though there will be some restrictions. In view of the above it appears the Federal Communications Commission is certainly keeping the amateur's interest in mind. The changes are primarily in the UHF bands starting with 220 mc. though there has been a reduction of spectrum available

in the 160 meter bands, the frequency range of 1875 through 1925 kilocycles is no longer being available.

Just in case some of your fellows would like to move out of the DC bands and go UHF, take note that the old 3300 mc. band has now been changed and the range allocated is 3,500 to 3,700 mc.

As long as novices must remain crystal controlled, there will be an expense for crystals if you want to have several frequencies available. Accordingly I suggest you check the crystal grinding article in the June, 1958 QST magazine where the art of crystal grinding is carefully explained so that the novice may grind surplus crystals or out of band crystals into the amateur allocation.

We received a nice QSL card from our long-standing contributor, Joseph Lofreddo. We do, however, note that the name on the card is spelled "Logreddo." Did you see this Joe? We will be most happy to put your card on the wall with the many hundreds we have as soon as someone can talk the members into a club house.

DX NEWS

A rather unusual call is M1B located at San Marino with the station operating on 21 mc. Both W0CPM and W0YVB have been favored by QSO's with this rare station.

VP2KM was recently visiting W0CPM, Bill. The handle at VP2KM is Ken, and Bill tells us to look for a big signal from Ken as soon as he gets his new beam up and his high power going.

Two more DXCC certificates are now in Nebraska, one going to Mac, W0YVV, and the other to DVEDEE.

VR3A, Ray, is holding nightly schedules with Australia. Ray is an expectant father and his XYL is in Australia, 3000 miles away.

Lou, W0VLI, has a KH6 and a XEO to his credit operating mobile.

K0AIS, Dick, after waiting a year and getting up at 5:30 in the morning finally rounded up VV1US on Formosa which is certainly a rare one.

Jerry, W0NKG, has 75 cards towards his DXCC certificate. Jerry tells us there is some very nice DX coming in on 15 meters these days until late at night.

W0AGO from Minnesota is scheduled to work the band as HC8AGO sometime before November of this year.

Pass along any DX news to Jerry, W0NKG, by phoning Terrace 6266.

Post Office Communications

The Postal Department appeals to all postal employees who are amateur radio operators and who may be able to participate on a voluntary basis in emergency radio communications. Each interested person should complete the Post Office questionnaire before May 31st, 1958, and forward it to his postmaster who will forward all applications to Communications Officer, Division of Real Estate, Bureau of Facilities, Washington 25, D. C.

We suggest that you contact your postmaster even though this issue of Ham Hum goes to press to late to beat the May 31st deadline.

COME IN, LINCOLN

Attention Lincoln Amateurs!

We see by the Lincoln log that several of the fellows, including K0JKH, W0YLY, K0RKY, and others, have made plans to build or have built 6 meter fixed frequency battery powered transmitter-receiver units. We understand the anticipated cost is \$30.00 and we would be very happy in receiving a detailed report from any of Lincoln fellows who have this equipment.

NATIONAL CONVENTION

The National ARRL Convention will be held August 15th, 16th and 17th, 1958 at Washington, D.C. The advance registration fee is \$5.00 payable on or before August 1st. Registration fee at the door will be \$7.50. To make advance registration, send your name, address and call, if any, including check or money order payable to Foundation of Radio Amateur Clubs, and mail this to National ARRL Convention, Post Office Box 3726, Washington 7, D. C.

The Convention will feature a ladies' program, QST lunch, buffet supper honoring FCC, a lunch honoring exhibitors, an SSB dinner honoring Marconi, a Wouff Hong initiation, and a memorial banquet. There will also be RTTY sessions, MARS sessions, VHF sessions, mobile sessions and all other phases of amateur radio. The Convention headquarters will be the Sheraton Park Hotel.

HOT STUFF

GE Laboratories announce a new tube which does not have a filament. It seems that's a step in the right direction but there is one small problem involved where you have to heat the tube itself to about 1500 degrees Fahrenheit. We know

there are a lot of hot shot operators on the air and maybe they can just hold them in their hand.

STAR GAZERS

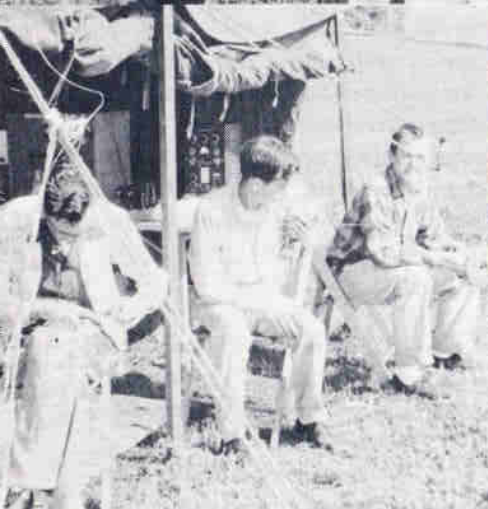
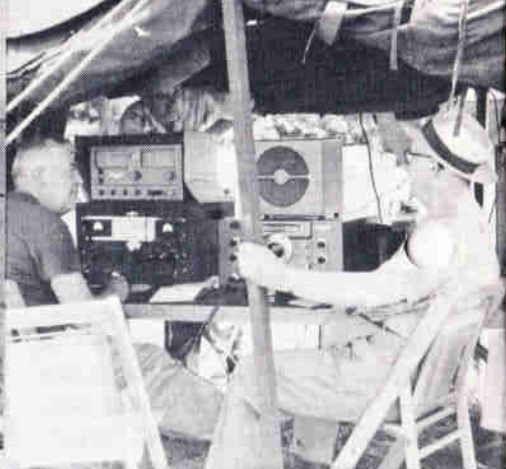
We know a lot of you fellows are star gazers, so why not put it to use? The Omaha Astronomical Society is interested in getting in touch with an amateur who would be willing to participate in a radio astronomy experiment. This would call for some outlay of equipment, but we believe the seriously minded experimenter would find it a challenging opportunity. If you are interested, Call Mr. Osborn at Glendale 5431 in Omaha.

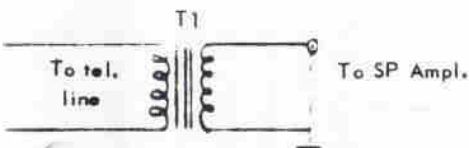
FOR SALE

Gold bonded germanium diodes, type IN307, priced at two for \$1.00. Forward resistance 2.5 ohms, reverse resistance one million ohms. Call John Straka, Market 7882.

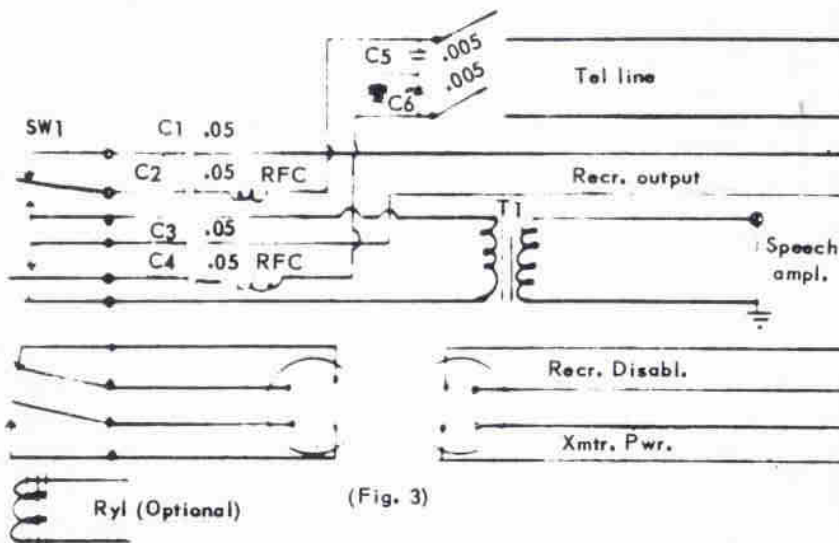
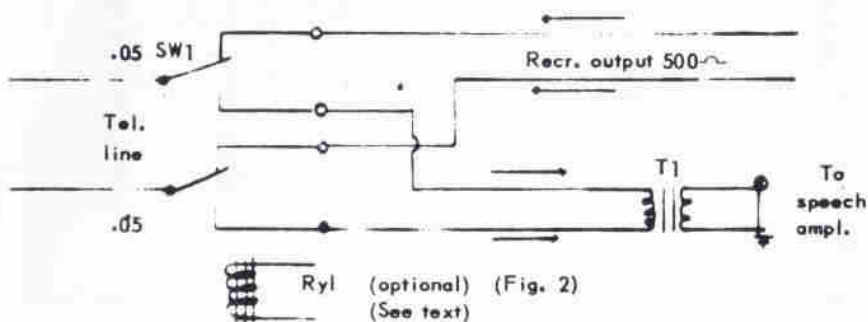
FOR SALE

Globe Scout 65B, incorporating push to talk and antenna relay. Electro voice Model 1000 Clipper also included externally with external receiver disabling relay. All like new at \$89.00. Phone REgent 1059, Kenny Akins, WØPZJ, located at 1903 South 55th Street.

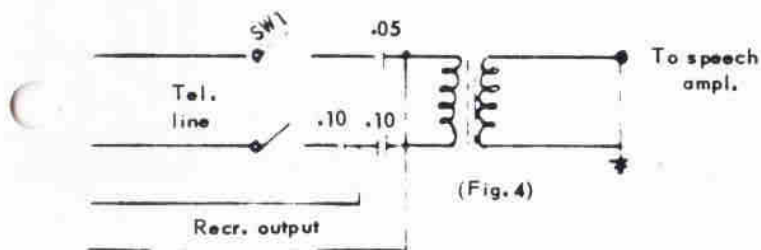




(Fig. 1)



(Fig. 3)



(Fig. 4)

AK-SAR-BEN RADIO CLUB INC.

P. O. BOX 626

OMAHA, NEBRASKA

NEXT MEETING

AK-SAR-BEN 4-H BUILDING

AK-SAR-BEN FIELD

JUNE 13, 1958

8:00 PM-SHARP

Form 3547 Requested

BULK RATE
U.S. POSTAGE
Paid
Omaha, Nebr.
Permit No. 221