HAM HUM

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DON'T FORGET THE FLEA MARKET THE SECOND SATURDAY OF THE MONTH

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

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Regular member and spouse	$3.60
Student member	$1.05

NEXT MEETING

WHEN: Tuesday, February 13, 1979

TIME: 7:30 P.M.

WHERE: JEWISH COMMUNITY CENTER
333 South 132nd Street
Omaha, Nebraska 68154

PROGRAM: HOW TO TALK TO A MICROCOMPUTER IN BASIC

Our guest speaker will be Mr. Jerry Greelis, President of Midwest Computer Company, which operates two retail stores in the Omaha area, Omaha Computer Store and American Computers.

Jerry will explain the BASIC computer language and show us how to communicate with these magic machines.

Following our brief lesson on BASIC, we will move to a hands-on demonstration with actual microprocessors! We hope to have enough machines on hand so that everyone will have a chance to actually enter a simple program and get it to run.

You already had to learn another language to become a Ham (Morse); now learn one more, BASIC. Come to the meeting and find out what all this new kind of fun is about.

73's and CU at the meeting.

Tom, KØPQR

VISITORS WELCOME – REFRESHMENTS – EYEBALL QSOs

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THE PREZ SEZ

I would like to thank Mr. Parley Applegate, WDØENB, for his presentation of last month's program on Commercial Licensing. It is always enjoyable to listen to a speaker who is not only knowledgeable, but also entertaining.

I announced at the last meeting, but will repeat here for those members not at the meeting, Jim Sanford, NØAIH, has been appointed as the 1979 Club Auction Chairman. We will again be holding the Auction at the Holiday Inn, 72nd and I-80, and the date will be April 8th. Complete details will appear in next month's Ham Hum. Watch closely for a possible change in the starting time. Several ideas have been proposed to help with the late hour at the finish of the Auction, and starting earlier seems to be the simplest solution. As usual, we ask all members to give the widest possible promotion, on the air, for the Auction. Jim will also be looking for the usual number of volunteers it takes to run it, and anyone wishing to give a helping hand should contact him directly.

Other upcoming events include, the 3rd Annual 3900 Club Hamboree, which will be held on Saturday March 10th, at the Marina Inn in South Sioux City, Nebraska. This event is sponsored by the Siouxland Amateur Radio Club, the Sooland Repeater Association, and the 3900 Club. Scheduled itinerary includes Entertainment, Exhibitors, and Flea Market, all day; Technical programs in the afternoon, and Dinner Banquet in the evening. 2 Meter Talk-in will be on the 37-97 repeater. Advance Registration, including Banquet, is $6.50, at the door is $1.00 higher. Admission without the Banquet is $1.00. Advance tickets and/or motel reservations available from Glen Holder, KØTFT, Hilton, Iowa, 51024. Further information available from Dick Pitner, WØFZO, (Phone: 712-258-1520) or the 3900 Club. (My thanks to Ferris Kramer, WØYZK, for sending me this info.)

Our friends at Kearney, Nebraska will again hold their annual Convention this year at the Kearney Holidome. Full details are not available at the time of this writing. I understand the scheduled dates are set for the April 1st weekend. Watch the 16-76 Lincoln repeater for further information.

Again, I remind anyone planning to go to the Dayton Hamvention, if you need Hotel or Motel Reservations, get them made before the end of February. If you don't, you will be staying someplace 50 or 60 miles away from Dayton. This is the Grand-daddy of all the Ham Conventions, and I urge everyone to attend it at least once. You just can't imagine the pandemonium created by 20,000 Hams all together in one spot.

Frank Wolczak, WAØIWF, and Dave Hamilton, WDØDLN, have volunteered to be the Co-Chairmen for this year's Field Day activities. I know it may seem silly to be talking about Field Day in February, but it's never too early to start planning, and these two guys are already two months ahead of the game. Several people have already volunteered for many of the required jobs. Many more are needed. I understand that Russ Minks, WAØVEE, is rebuilding the Club's rotors and they will be in first class shape for the first time in years. The Board of Trustees at their last meeting authorized the purchase of two new towers for the Club. We will have six full sections

of Rohn 25G, and two 5 ft. top sections. This will give us two brand new 35 ft. towers. I also have been told that the labor to build the necessary tower base plates has been donated, along with new guy wire. This should give us the best tower and antenna system that we've ever had. Hopefully, Frank and Dave will never have to repeat their demonstration of last year on how to bring down a tower quickly.

Much has been said lately, on our repeater, about the status of the repeater system. I ask all members and repeater users to be patient a while longer. It seems that every time a firm decision is made, something happens to prevent the change from taking place. I can sadly report that the last plan to move it to the Eppley Care Center had to be dropped. The site is no longer available to us. Hopefully by the time you read this, we will have accomplished something in the way of improved performance. As a stop-gap measure, the old split site repeater will probably be returned to service, simply to provide increased coverage. This is by no means the last chapter in the story. We will continue to look for other sites that are available, and I emphasize, are also within economical reach. The apparent number of users on 34-94, and the donations to it, have been down for some time now. This may simply be due to the poor system performance, I don't know. But, when you are in a position, as I am, of casting a vote to allocate large sums of money that belong to the total membership, for equipment that is used by a minority, the consideration of the amount that flows in donations becomes a large one indeed. If the users of 34-94 want to financially support some of the ideas I've heard discussed lately, then let us proceed with vigor. Site availability remains the largest problem however. It is pointless to discuss the money problem if we don't have a site that is superior to what is already available. To clear the record on one other related point, I recently heard someone say something about "all the money we spend" for the present single site Spec-Com repeater. I wish to restate that we spent nothing for the Spec-Com. It was donated to the Club.

I wish to close this month on a humorous note. You have all heard of Murphy's Law. There are many similar laws, and I hope to bring you one of them each month. For February we shall examine Chisholm's Third Law which states: Proposals, as understood by the proposer, will be judged otherwise by others. The Corollaries to this are, 1. If you explain so clearly that nobody can misunderstand, somebody will. 2. If you do something which you are sure will meet with everybody's approval, somebody won't like it. 3. Procedures devised to implement the purpose, won't quite work.

73's and see you at the next meeting.

Tom, KØPQR

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The teacher was lecturing to the class on the meaning of "average." When she asked one of the students to give an illustration he said, "Well, if a man was standing with one foot on a hot stove and the other foot in a bucket of ice water, you would say that on the average he was comfortable."

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NOTES FROM JANUARY 16th BOARD OF TRUSTEES MEETING

Treasurer's report for December 1978, prepared by Jim, JPN, included all the Club assets and s read by Tom, PQR. Mac, BMJ, gave the treasurer's report for January 1979. Motion by Frank, IWF, to accept, seconded by Jerry, PPF, and approved as read.

PQR made a motion to purchase six (6) sections of Roan Alfa Omega towers at the price of $209.70 and also purchase two (2) top sections of towers from the lowest prices available to the Club. The Field Day Committee is authorized to make the immediate purchase. Motion seconded by Jim, QGV, and approved by the Board.

Frank, IWF, informed the Board that Past President Mike Wilczynski, BMV, will donate approximately 1000 feet of guy wire to the Club before Field Days. The Club thanks you, Mike. Frank, IWF, reported that Ted, UEB, will build the base plates for the new towers along with some ground anchor rods. The Club also thanks you, Ted.

KØTVD, Chuck Sudds, has a log book for Field Day logging. The Board members were shown the finished product and everyone agreed it's just great. Thanks to you, Chuck.

Joseph Niemann, FWB, discussed possible things the Club could participate in to improve and interest people into knowing what ham dio is and suggested some places ere we could start to spread our goodwill.

Chuck Hoffman, NVL, the Club's Information Officer, held a discussion with the Board members defining his work. The Information Officer has a tremendous job to perform. Let's all help Chuck with information that might help our Club grow. Chuck's job will be a little easier and he will appreciate it very much.

Club Secretary
Robert R. Chereck, Sr., WBØTVP

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MEMBER ADDRESS CHANGES

Kevin J. Clatanoff, WAØYCC
7100 Whispering Winds Drive
Austin, Texas 78745

Richard D. Jugel, KØDG
(plus XYL Marlene and KAØBAA, Lisa)
8014 Taylor Circle
Omaha, Nebraska 68134

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CLIQUE

Page 2, January 1979 HAM HUM, subject "Clique."

I suspect your **trouble** is that the same "Clique" is running the Club that ran it when I was Chairman (President) back in 1948. That "Clique" is the same bunch that always runs everything. They are the people who come with their heads up, their ears open, and their minds in gear. They have guts enough to stand up before the gang and take part in the meetings. They have ideas and are willing to express them and are willing to back them all with work and the expenditure of time to see that their efforts are a success.

I know these guys. They're the ones who always haul all the stuff out to field day and picnics. They're always out putting up antennas, taking part putting up repeaters, contributing parts and pieces to build them, and money to run 'em.

Well, all I can say is I'm sure glad that old "Clique" is still in there because if it wasn't I might have to get out there and do something myself. And I'm too old to start that all over again.

WØQXR Herbert D. Curry

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WHO CARES. . . ABOUT DX?

Do you have a receiver? A transmitter? How about an antenna? (Don't forget the dummy load.) Well then, as with the majority of hams, you have the bare necessities of a station capable of working any and all DX.!

Now that we all know DX is at our fingertips, let's proceed. There are various extremely difficult terms known only to the world of DXers. Some include international YL system, short path, long path, DX net, ionosphere, low radiation angle and scads of other exacting expressions. In months to draw near, I hope to investigate these and other terms associated with DX groups.

Another of my goals is to keep a current list of active DX stations around the globe that may be helpful to the real "country hunters." Have you worked 3Y5DQ on BOUVET yet? Some other exotic active countries include XA2P Burma, ZB2BU, Box 292, Gibraltar and LU3ZY on South Sandwich. I hope to print the correct QSL info and operating sked with each station listed.

If 5 band DXCC is in the back of your mind, now is the time to be making those 80 and 40 meter contacts. Soon the noise level will elevate as winter progresses and the signals will fade and be harder to pull out. I've heard 4s and 3s working Europe on 40 about S1 here. How is everyone else doing locally on 40 and 80?

To have an interesting and successful DX column, there has to be response from people like you. Some of the problems or questions will be printed so that everyone can help with solutions. I am attempting to work out some type of local DX competition (Ak-Sar-Ben Amateur Radio Club members only). Details will be announced later.

Send all letters to: Bob Grinnell, WDØFDE, 11013 Harney St., Omaha, NE 68154.

73s es good DX,

Bob Grinnell

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THE FLIP SIDE OF GOOD OLD CW

After reading last month's "Good old CW" I feel inspired to write another opinion on the subject. CW can be just as rewarding, satisfying, and relaxing as any other facet of Ham Radio. Many people seem to share the opinion that CW is a necessary evil to pass the FCC exam. One doesn't have to look very far to see what might become of Ham radio if it were not for the code. To answer the question asked, YES, I have seen CW operators in some pretty relaxing positions. Also come to think of it, I can remember my late Dad who was a Morse operator all his life carrying on a conversation while pounding out traffic on the mill and it didn't seem to make much difference where his feet were.

Learning CW is only work if you make it work. It can be a real accomplishment for the effort required. This is where the instructor comes in; if he or she does their job and generates the right atmosphere in the classroom, it is a pleasure to learn the code. One of the biggest mistakes with the code is to hold the old carrot out in front of the donkey, because soon the donkey realizes he is never going to get it and gives up and doesn't like carrots anymore. This seems like a very short-sighted means to the **end.** It is my humble opinion that in code practice to use speeds where the student is only getting 50% to 80% of what is coming is inefficient and does not lead to confidence. This is exactly why people develop the attitude toward code expressed in last month's article. Code, like speech, is a form of communication and if I talk so fast you can't understand me, all is lost. Therefore, to practice code at a comfortable speed and let nature take its course just might be as fast a way to build up speed with pleasure and confidence and come out with an entirely different feeling about CW in the end.

After a while it's always a good idea to put on a shirt with a pocket; this is so you have someplace to put the pencil. Having come along with the art of copying the code, it's a second step to get to read it without writing it down. Most CW Hams make notes about the same as with an SSB QSO. Remember, it is possible to work a DX station that does not speak English on CW, and it's much easier to understand CW than some of the broken English used by DX stations. Please do not look at CW as an outdated mode, a grind, or a boring necessity to obtain the license; it can be a real challenge and very relaxing and exciting mode of amateur communication.

Charlie, WØQQN

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THE QSL CORNER

(1) **THE I.R.C.**

I.R.C. stands for International Reply Coupon which is exchangeable for one surface rate letter postage in foreign countries. For airmail class more than one I.R.C. is required. Some countries require up to 5 I.R.C.s for a single one ounce letter. The current going rate for I.R.C.s is 42¢ when purchased in a U.S. Post Office. The number of I.R.C.s required for the DX reply can be found in the Callbook front pages along with the current post rates for outgoing letters and cards. I.R.C.s are not applicable in all countries so a check of the Callbook is in order before attempting to use this method.

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ZERO-BEAT DISPLAY

VISUAL ZERO-BEAT INDICATOR USES RESERVE-POLARITY LEDS . . .

Two light-emitting diodes connected in parallel, but with opposing polarites, make an inexpensive display for indication zero-beat frequency (the frequency at which a receiver is exactly tuned to the signal being transmitted). The display can be driven by an audio-frequency voltage from a single-sideband receiver or by the signal for an rf signal-generator headset. A current-limiting resistor protects both LEDS from overload.

When the input frequency is more an 1 kilohertz away from the zero-beat frequency, both LEDS appear to be on all the time. Each one is correctly biased for half a cycle of the input and shut off for the other half. As the input frequency comes within about 20 hertz of zero beat, the LEDS will flicker until zero beat is reached. Both LEDS then go out and remain out over the width of the zero-beat-frequency notch, which is about ±5 Hz.

While the display is being tuned, LED intensity varies, since it depends on the low-frequency response of the audio amplifier being used. If the amplifer can go down to dc, the circuit can be used to detect the direction of current flow — each LED can indicate a different direction for current flow. If red and green LEDS are used, the direction of current flow can be color-coded.

—by Calvin R. Graf, from *Wlectronics*, March 15, '73 and QSP

de Fresno Skip

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QSL MESSAGE TRAFFIC

WØFQB, the official message center for the Zero District DX QSL Bureau, submits the following report for 1978. During the month of December, a total of 332 messages was sent to our DX hounds in the district, with a grand total of 1201 messages for the year 1978.

Liaison stations contributing to the service and supplying outlets for the different states were: WAØAUX (IA & MN); WBØKHO (IA & MO); WØFIR (KS); WØEUT, WØGEQ and WØHTA (CO, SD & ND).

Transmissions included the following text, to wit:

Please send SASE and your call letters for _____ ounce (s) of DX QSLs at QSL Bureau, Box 291, Omaha, NE 68001.

(Ed. Note: Thanks, Art WØFQB, for your assistance.)

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MOVS

The article in HAM HUM about the protection provided by MOVs, I tried them, installed several from main fuse box to refrigerator and ham gear. Had close hard strike of lightning, did some damage, but the protected gear survived. Also, light bulbs on same circuit as refrigerator do not show flare-up and last much longer.

Dayton Phifer, WØVEA

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CONTROL OPERATOR INSTRUCTIONS FOR WRØAJT

If you are guilty of any of the following, be prepared to shut off.

Autopatch is to be terminated in the event of:

1. Any business call. Business calls are defined as pertaining to the normal business activities of **any** party.

The only exceptions are: a. Calling a tow truck, provided money or payment is not mentioned. b. Any call to 911, 411, or 611 (Phone repair service).

2. Foul language, or indecent conversation.

3. No call sign given. (Do not terminate until number has been dialed. This provides a record of the number dialed. Also, in some parts of the country it is standard practice to give the call sign over the dial tone, or after the dial tone is acquired.) 3a. Alternative for no call sign given. Wait until the number has been dialed, then break in and ask for the call sign. If it is not given, terminate the patch. 3b. Do not terminate the patch if you hear a three digit number being dialed, even if no call sign is given, as it will probably be a 911 call. If it turns out to be Directory Assistance, terminate the call.

Main Repeater should be turned off in the event of:

1. Stations on it use foul language, or play music intentionally.

2. If it is used for business communications or transactions. Exception: If 2 operators are discussing an equipment trade, swap, or other private deal **not** involving their normal business. (Such as Ham Hum Swap Ads, etc.)

3. Any illegal use.

4. If repeater is locked up due to malfunction or other prolonged nuisance.

If anyone should hear the above infractions, on any repeater, he should feel free to call it to the attention of the offender. These are **your** frequencies, and if someone is messing them up with illegal operation, you have every right to say something. The sharp restrictions placed on autopatch are the result of lack of anyone saying anything.

Omaha has had very little trouble, with one exception, and the above is to let all stations know that we are prepared.

John Gebuhr, WBØCMC

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WORLD OF VHF
TOM KØTLM

THE GREAT INTERMOD CONTROVERSY

Whose fault is it that signals are being received on the 2 meter FM Band where they shouldn't be? Specifically, signals which are a mixing product of 2 or more repeaters. Some operators claim that mixing is occurring at one or more repeater transmitter sites. Others claim the major problem lies in the operators' own receivers. Many accusations have been hurled and some solutions have been proposed but it appears that no one has really analyzed the problem to settle the argument. Here is an attempt to perform such an analysis.

First, let's look at the question of mixing in repeater transmitters. Several 2 meter repeater transmitting antennas, including the ones involved the most in the controversy, are within radio line of sight from each other. Therefore, path losses between these repeaters are easily predicted. One can also easily measure signal strength at any location, but for this argument let's use the predicted values. The formula for free space attenuation between isotropic radiators may be expressed as a (db) = 37 + 20 Log F (MHZ) = 20 log d (miles) 20 log F = 43.6 at 2 meters so a = 80.6 + 20 log d (miles).

To use this let's assume two repeaters 5 miles apart. Both have 6 db gain antennas (8.2 db over isotropic) and 1 db feed line loss. Both have output power of 30 watts. The object is to see how much of one transmitter's signal arrives at the output of the other transmitter.

a = 80.6 + 20 log 5
= 80.6 + 20 X .7
= 80.6 + 14 = 94.6 db path loss

Gain due to antennas and transmission lines is 8.2-1 + 8.2-1 = 14.4 db net attenuation is 94.6-14.4 = 80.2 db. Which we'll call 80db. 80 db attenuation applied to 30 watts is $1 \times 10^{8} \times 30 = .3$ microwatts or expressed as a voltage across 50 ohms

$$V = \sqrt{WR}$$

$$= \sqrt{.3 \times 10^{-6} \times 50}$$

$$V = \sqrt{15 \times 10^{-3}}$$

$$= 3.87 \text{ MV}.$$

Next let's look at what happens to this signal in the "receiving" transmitter. Since this signal is on nearly the same frequency as the output of the transmitter the signal produces a current in the tank circuit the P.A. tube (or transistor) appears as a time-varying resistor-a non linear circuit element whose presence can produce mixing. The strongest mixing products are the 3rd order products 2A-B or 2A+B. The one of interest here is the 2A-B with A being the transmitter's own frequency and B being the "received" frequency. The mechanism here is basically like a single diode mixer. The best theoretical conversion gain of this type mixer is -3 db. Most likely the transmitter output stage, not designed to be a mixer, will have a gain much less than that.

Using the figure derived earlier for the signal strength as .3uW at -3 db conversion gain, a signal with the frequency 2A-B might be radiated with a power of 0.15uW or 2.74 MV.

The next question is how far can

this signal be heard; 2.74 mV is 74.4 db above .5uV which is a quieting signal in most receivers. With 7.2 db gain in the antenna the margin is increased to 81.9 db. For the test we assume a mobile with a 3 db gain (5.2 over isotropic) antenna, 81.9 + 5.2 = 87.1 db. The path loss is 86.6 db at 2 miles so this signal might be heard in a mobile two miles away.

If a more likely conversion gain figure is used however, like 23 db to convenient, the margin over .5 uV shrinks by 20 db to 67.1 db. The distance change for 20 db change in path loss is 10 to 1 or 0.2 miles.

More concrete data on intermodulation characteristics of transmitters is not readily available but I hope soon to have experimental data. Meanwhile, estimates must suffice (unless you know of a source of data I don't).

On the other hand there is "intermod" produced in receivers. It should be obvious to many that this form of intermod is potentially easier to produce but harder to analyze mathmatically. Receivers amplify signals, making conditions for mixing (a non-linear) stage possible with relatively small signals at the antenna.

In the case of receivers, I have some experimental data, produced by feeding two signal generators operating at 146.82 and 146.88 mhz into a receiver operating on 146.94 mhz. Please note that the figures given here are for one particular receiver, probably not representative of a typical receiver but nevertheless interesting.

For example, 500 microvolts of signal on 146.88 together with as little as 2.5 microvolts of 146.82 produces a noisy but readable signal on 146.94. Increasing the '.82 signal proportionately increases the on '.94. If the signal on '.88 is reduced to 100 uV, a signal level of 50 uV on '.82 is required to produce a readable signal.

****

RECENT CONTRIBUTORS

Ham Hum Postage
Richard E. Bowman, WØWZR
Mrs. Anthony Klein
Scott E. Persson, WBØQPP
Bernard S. Sedlacek, WØGKK

Repeater 34/949
Maurice W. Costello, KØYWY
Edward J. Hofmann, WDØHBY
Steven P. Hutchinson, WBØVLL & Darlene M. Hutchinson, WBØTTK
Ray F. Kydney, WAØWOT
Ted W. Parsons, WBØTYB
Carl J. Quijas, WBØTUE
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Ray F. Kydney, WAØWOT
Albert H. Maller, WØDCQ
Ted W. Parsons, WBØTYB
Carl J. Quijas, WBØTUE

Thanks to all!

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You cannot get to the top by sitting on your bottom.

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FCC Notice of Proposed Rulemaking

In December 1975, the FCC issued a Notice of Proposed Rulemaking. In brief, the FCC's proposal would have required amateurs submitting an application for renewal to attach the ORIGINAL of their amateur license, rather than a photocopy as then permitted.

The FCC discovered a "couple" of hams altering their original and then making a copy which was not detectable as a forgery, in order to upgrade their license privileges. And due to the "couple" out of over 300,000 hams, they wanted to force hams to surrender the original of the license which many, if not most, hams cherish.

The Commission received EIGHT replies to this notice. Think of it--- just EIGHT! Only eight hams seemed to care about keeping the original. Or, actually, only seven, as one agreed with the Commission! So, you 300,000 plus hams that can keep your original now(The Commission agreed with the seven against the change) can be aware of how few saved your bac Sounds like voting day at the polls!

I hope after all the verbage that goes out in magazines that W2NSD was one, and the ARRL another.

de WØJJK

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You can always tell a well informed man. His views are usually the same as yours.

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HAM HUM SWAP

NO CHARGE FOR SWAP ADS (NON-COMMERCIAL) SUBJECT TO SPACE LIMITATION. MUST BE SUBMITTED IN WRITING TO P.O. BOX 291. SEE COPY DEADLINE PAGE 2.

WANTED—HF SSB transceiver with single band or multi band HW32, HW100 or HW101 working or not or what have you in this power range.
Call any evening after 8-402/564-8657 or write: Lawrence Hiltner, WAØQCI, P. O. Box 331, Columbus, NE 68601

FOR SALE—Regency HRT-2 handie-talkie, 6 channel, 2 watt hi and 1W low power. Complete with rubber duck antenna, desk top battery charger, ext. mic, earphone, ext. DC power cord and leather case. Crystalled for 34-94, 40-00, 22-82, 52-52, 16-76.
Lowell Jackson, WAØHKT; phone 493-3590

WANTED: SP220, good condition or bad. Just price it right.
Herbert D. Curry,
WØQXR;
phone 397-7415

FOR SWAP OR SALE: SP600 receiver-clean; Motorola 25W transceiver, tube type; also RCA transceiver, tube type-clean. Both on 144-148. Also 50 mc Motorola transmitters 25W.
Herbert D. Curry,
WØQXR;
phone 397-7415

ADDITIONS TO ROSTER

Charlotte F. Kaplan
(XYL of WDØBVH)
5431 Lafayette Avenue
Omaha, Nebraska 68132
Phone: 556-4250

Sharon K. McPherson
(XYL of WBØSMC)
3209 Blue Ridge Drive
Omaha, Nebraska 68147
Phone: 733-7680

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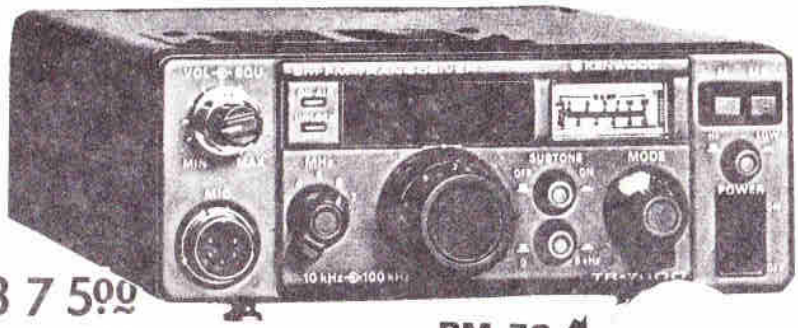

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Even without its optional "Remote Controller," the TR-7600 gives you • Full 4-MHz coverage (144.000-147.995 MHz) on 2 meters • 800 channels • Dual concentric knobs for fast frequency change (100-kHz and 10-kHz steps) • 5-kHz offset switch • MHz selector switch...for desired band (144, 145, 146, or 147 MHz) • Mode switch for operating simplex or for switching the transmit frequency up or down 600 kHz for repeater operation...or for switching the transmitter to the frequency you have stored in the TR-7600's memory (while the receiver remains on the frequency you have selected with the dual knobs) • Memory channel...with simplex or repeater (plus or minus 600 kHz transmitter offset) operation • Digital frequency display (large, bright, orange LEDs) • UNLOCK indicator...an LED that indicates transceiver protection when the frequency selector switches are improperly positioned, or the PLL has malfunctioned • 10 watts RF output (switchable to 5 watts low power) • Noise-cancelling microphone • Compact size (only 6-7/16 inches wide, 2-7/16 inches high, and 9-3/16 inches deep)

The optional Remote Controller, with a built-in microprocessor, provides more operating features to the TR-7600 2-meter FM tranceiver than found in any other rig! With the Remote Controller attached to your TR-7600, you can...

• Select any 2-meter frequency • Store frequencies in six memories • Scan all memory channels • Automatically scan up all frequencies in 5-kHz steps • Manually scan up or down in 5-kHz steps • Set lower and upper scan frequency limits • Reset scan to 144 MHz • Stop scan (with HOLD button) • Cancel scan (for transmitting) • Automatically stop scan on first busy or open channel • Operate on MARS (143.95 MHz) • Select repeater mode (simplex, plus transmit frequency offset, minus offset, or any of six memory transmit offsets) • Select transmit offset (1 MHz/600 kHz)

The Remote Controller's display indicates frequency (even while scanning) and functions (such as autoscan, lower scan frequency limit, upper scan limit, error, and call channel).

Subject to FCC approval

HOURS: Tues.-Wed., Fri. - Noon/5 P.M. Thurs.-Noon/8 P.M. – Sat.-9 A.M./5 P.M.