



# HAM HUM

Published by

AK-SAR-BEN RADIO CLUB, INC. - Omaha, Nebr. 68101  
Post Office Box 291 - Downtown Station



April 1970

Vol. XX  
No. 4



## ANNUAL AUCTION

WHEN: FRIDAY, APRIL 10, 1970

WHAT: AUCTION—bring your excess gear and parts.  
Terms cash and carry. (See page 10.)

WHERE: GENERAL MOTORS TRAINING CENTER  
225 North 80th Street, Omaha

TIME: DOORS WILL OPEN AT 7:00 P.M. AUCTION WILL  
BEGIN PROMPTLY AT 7:30 P.M.

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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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AK-SAR-BEN RADIO CLUB, INC.

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## PRESIDENT'S CORNER

Our March meeting which we all enjoyed is reported along with pictures elsewhere in this magazine. Our special thanks go to John P. "Red" Munnely and his great staff.

At their last meeting your Board of Directors completed plans for the April Auction. Arrangements have been made for us to bring our gear to the General Motors Training Center as early as 7:00 P.M. so as to get it registered. Items will be auctioned in order of their registration so bring them as early as you can. The auction itself will start at 7:30 P.M. Rules of the auction are the same as last year and are printed elsewhere in this issue.

Coffee and donuts will be served during the auction.

73,

Harold, WAØDGA

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The pioneers who blazed trails into the wilderness now have offspring that burn up the roads.

The Ham Monitor, Ks.

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## WANTED

Info on ARC-1, ARC-4, 394/U, T-278/U, DY-98/G. Need circuit diagrams, tube layouts, etc. Call Bob Serlet, 553-0469, or write, 3601 North 67th Avenue, Omaha, Nebraska 68104.

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## NEW MEMBERS ADDITIONS TO ROSTER

J. William Hendrix, WØFCE

203 Chevro Lane

Bellevue, Nebraska 68005

Phone: 291-5143

John Eric Lindell, WØYCY

17 Edison Avenue

York, Nebraska 68467

Phone: 362-5824

Richard E. Newsome, WØHXL

4304 Erskine Street

Omaha, Nebraska 68111

Phone: 453-6232

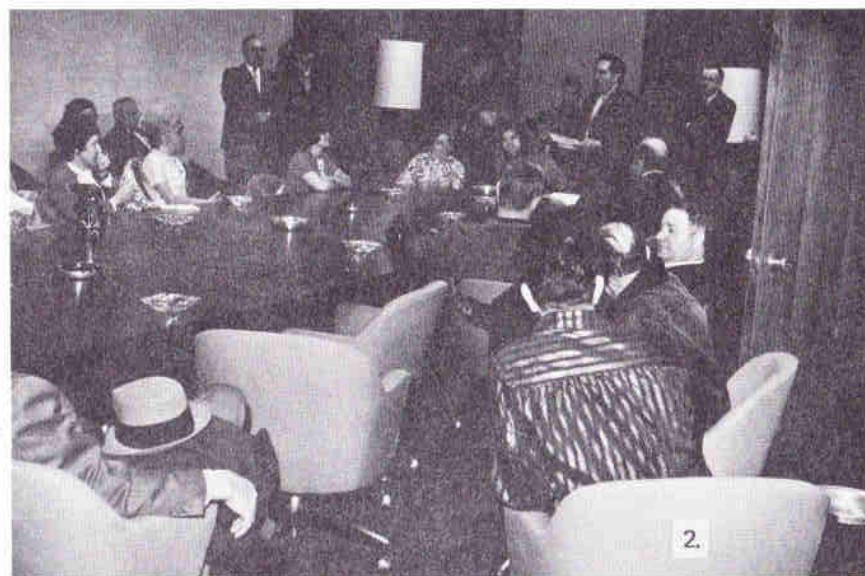
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## MARCH MEETING

By Erv Heinz, WAØEEM

Friday the 13th wasn't unlucky for our Club! We met as a group (picture 1) at the Main Post Office in Omaha.

President McClenahan, WAØDGA, held a brief business meeting (picture 2) and then turned the group over to





Mr. Thurlow P. Noble who briefed us on the tours (picture 3). Mr. Dennis McCullum and Mrs. Martha Gould, also postal employees, divided our

group and respectively conducted separate tours.

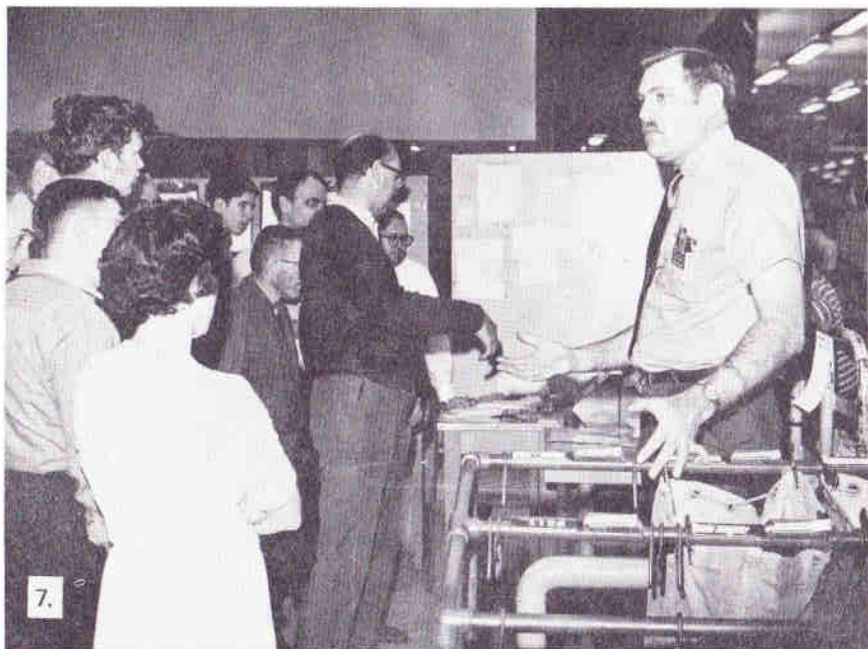
We toured the maze of conveyor belts (picture 4), facer canceler





(picture 5), zip code reading devices  
(picture 6), parcel post sorting (picture





7), shipping and receiving areas (picture 8), and much more. Picture 9 shows Bryce Nelson, WAØTSO, (right)

and guest Don Trapp, WNØAOI, examining the postal department employment opportunities.



The tour guides are to be commended for an excellent narrated tour. All questions were fielded well and we could see one place our tax dollars were being well used. The efficiency amazed all of us. Even Sharlene and company (picture 10) found fellow ham Jim Anderson, KØDNE, her husband, working hard as usual. He did manage to join our group during his lunch break.

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**OFFICIAL BULLETIN NR 262  
FROM ARRL HEADQUARTERS  
NEWINGTON CONN FEB 26 1970  
TO ALL RADIO AMATEURS BT**

The Federal Communications Commission has issued a notice of proposed rulemaking, Docket 18,802, to raise application and license fees so that its entire budget will be covered by revenues from licensees. League Lines in November 1969 QST gave advance warning of the possibility. Under the proposals, amateur application fees would go to nine dollars for new, renewed or upgraded licenses, four dollars for modified licenses and 25 dollars for special call signs. Citizens radio service application fees would rise to 19 dollars along with taxicabs, etc, but commercial radio operator fees would stay where they are now. A new television station license could, however, cost as much as 50,000 dollars. Comment deadline is April 20 and reply deadline May 11, 1970. ARRL members wishing to express a view on the docket should be in touch immediately with their respective directors as listed on page 8 of QST. Further information will appear in the April issue AR

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**FOR SALE**

Gonset G-76 transceiver  
AC power supply  
DC power supply  
80 - 6 meters . . . . . \$175.00

Call Ed, KØEYR, at 733-5199  
after 4:30 P.M.

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**TO ALL INTERESTED  
AMATEURS**

From Leo F. Connolly, KØJIU

Within 7 days, KØJIU and WØYCP will have in operation a repeater at Council Bluffs, Iowa.

This repeater is not intended to be in competition with the present Omaha repeater, but is intended to provide a backup communications system for the Omaha repeater should it be put out of operation by natural disaster or equipment failure.

The Council Bluffs repeater will not be in continuous operation. It will be an open repeater and will remain an open repeater unless its use is abused.

The repeater operation will be narrow band with a 5 kc deviation and will have an initial output of 60 watts. The receiver antenna is located approximately 150 feet above ground elevation of 1,250 feet and is in an isolated area clear of interference. The transmitting antenna will be located approximately 50 feet above ground elevation of 1,150 feet at KØJIU.

The Council Bluffs repeater has a capability of feeding 146.340 audio to the Omaha repeater by way of a 450 Mc. link and eventually the repeater will have the capability of transmitting on 146.94, in the event of failure of the Omaha repeater. However, it is intended that the input frequency will normally be 146.220 and output frequency will be 146.820. The transmitter and receiver sites at this time are linked by telephone line so for the time being, there is no need for additional FCC licensing.

All amateurs are welcome to use the repeater providing they have the proper operating techniques and equipment.

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## CODE AND THEORY CLASSES

Bob Lockwood, WAØDHU

The code and theory classes sponsored by the Ak-Sar-Ben Radio Club are a smashing success. The last class will be April 8th and it is expected that many will pass their amateur exams on April 16th.

The Class started out with about 30 students and leveled off with about 23 regulars. These people are showing real incentive. They have braved extreme cold and are working many hours on their own studying the code and theory.

Highlighting the sessions are many good demonstrations, films, lectures, and the last two weeks devoted entirely to a review of all the questions in the novice and general portion of the license manual.

Our code practice sessions utilized an instructograph supplied by Creighton Prep; also the use of an electronic keyer to assure good quality code. Films were supplied by ARRL.

Yes, as we draw to a close this 1970 session of the code and theory classes, we need to thank many for their efforts in making it the success it is. Those on the faculty include WØWRT, John Snyder; KØLUG, Bob Andrus; WAØTSO, Bryce Nelson; K1MNF, John Giulietti; WAØWTP, Larry Bates, who is now in the service; and WAØDHU, Bob Lockwood. Also, WØRMB, Cecil DeWitt who attends the classes helped with a good demonstration on transistors. Our thanks go to these men who have worked hard to make it worthwhile for the students to come. Because of their effort many will upgrade.

We thank Father Haller, WØGPT, of Creighton Prep for the use of an instructograph and tapes for the code practice; Erv Heinz, WAØEEM, for the use of a projector; Royal Enders, KØLYO, for securing a slide presentation on transistors from General Motors; and Staff Members who supplied equipment for the classes. Also, we thank the Board of Directors of the Ak-Sar-Ben Radio Club for their support.

We also express our gratitude to officials of the Red Cross who allowed us to conduct the code and theory classes at the Red Cross Chapter House. The class schedule is 14 weeks and even with many organizations seeking use of the facility, we were given the nod.

This is the second year for the classes. A lot of time and effort has gone into this project by many, but it was time and effort well spent. The results of this project are very fruitful with many becoming hams or upgrading. As a club project, the club can't help but benefit. Many on the staff such as Bryce Nelson, WAØTSO, Bob Andrus, KØLUG, Larry Bates, WAØWTP, and John Giulietti, K1MNF, took the bull by the horns for the first time. As an incentive to others for future participation in this project, I would like to make the statement that one learns much by teaching. The code and theory classes should become an annual project but to do so will depend upon people who want to learn while helping others to learn.

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## APRIL AUCTION

TERMS: Cash and Carry. A 10% commission will be charged on all consignments, with a maximum commission of \$10.00 on any one item. (All items sold at over \$100.00 owner will pay only the \$10.00 fee.) Minimum bids will be 25¢. No minimum price will be accepted; however, the owner may bid on the item to protect his sale item. If the owner's bid is the final one, the fee will be 10% of the bid - maximum \$1.00.

The Auction will be arranged so that the first items brought in will go on the auction block first. Come early so you may look over the selection of ham gear and get your consignments registered. Refreshments will be available during the Auction.

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## WANTED

A good set of earphones, preferably with cushions.

Jim Anderson, KØDNE

Phone: 551-0630

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## OLD OLD TIMERS CLUB

Andrew L. Shafer-W8TE is the new President of the Old Old Timers Club, Inc. with William B. Gould-K2NP as the new Vice President.

Ray Meyers-W6MLZ has been appointed Executive Secretary-Treasurer and Editor of "Spark Gap Times," official magazine for the OOTC.

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## OFFICIAL BULLETIN NR 265 FROM ARRL HEADQUARTERS NEWINGTON CONN MARCH 19 1970 TO ALL RADIO AMATEURS BT

(Headquarters is conducting a survey of the effectiveness of the Official Bulletin Station program. It will be appreciated if you will advise the identity of the station from which you first copied the following bulletin and the frequency on which copied.)

The amateur radio satellite Australis Oscar 5 has reached the end of life. All amateurs who received the satellite's signals are urged to send a report to AMSAT, Box 27, Washington, D.C. 20044. Each report will be acknowledged with an attractive QSL. Of special interest are reports of the 2 meter signal after February 13, and reports of the 10 meter signal after March 8, to determine who was last to hear the signals. Satellite observations during the March and 9 solar eclipse and auroral activities are also sought  
AR

(Ed. Note re NR 265: Please note special request from ARRL regarding identity of station and frequency. If you do not receive bulletins by way of an Official Bulletin Station but depend upon Ham Hum exclusively, you might send a note to ARRL Headquarters. If you believe we should attempt to have an Official Bulletin Station for the Omaha area, please send your suggestion to Ham Hum. If you are not familiar with the Official Bulletin Station, please use the enclosed card to request further information from Ham Hum.)

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Feb. 19, 1970

OFFICIAL BULLETIN NR 263  
FROM ARRL HEADQUARTERS  
NEWINGTON CONN  
MARCH 5 1970 TO ALL  
RADIO AMATEURS BT

Ak-Sar-Ben Radio Club  
Omaha, Nebr.

Hi:

Enjoyed a fb eyeball QSO with  
Casper, Wyo. Amateurs Feb.  
17, 18. Of particular interest was the  
experience of the amateurs and Mars  
members in developing 2 meter FM  
communications and repeaters.

They report similar range and skip  
conditions to what we experience,  
perhaps just a little bit better range  
mobile to fixed station.

That reusable commercial gear that  
can be used on 6 or 2 carries too high  
a price tag to encourage buying,  
converting, etc. Same old story; if  
surplus can be used by amateurs, the  
price is high.

Many of you may remember Dick  
Kingsolver; he was very active in  
Nebraska many years ago. Dick  
worked out a 6 meter ground plane,  
rugged enough to stand the Wyoming  
winds, and found it also gave a 6 db  
gain on 2 meters. That is compared to  
a 1/4 wave 2 meter ground plane; this  
worked as a 3/4 wave on 2 meters and  
gave the 6 db gain, plus a very low swr.

The interesting part of the  
ruggedizing was in the use of 1/2"  
conduit for the ground plane,  
interlaced on a flange with pipe  
connections to mount on a 1" pipe for  
elevation. The 1/2" conduit elements  
form a square around the center, and  
the butt end bolts over the next right  
angle element, this gives a 30 degree  
sloop to the ground plane, besides  
having two bolts fastening each  
element.

73,

Dayton, WØVEA

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FCC has issued a notice of  
proposed rulemaking governing ama-  
teur repeaters above 50 MHz. Key  
features include relaxed logging of day  
and time period, technical and  
operating conditions; automatic identi-  
fication at intervals of 3 minutes or  
less; whistle-on or other coded access;  
600 watt input; no cross band, chain  
repeaters or multiple outputs; licensee  
must monitor and control repeater  
directly or by radio. Proposed  
channels, subject to change after  
comments by interested amateurs, are  
inputs 52.5-52.7, 146.3-146.6,  
223.1-223.3, 447.7-448.9 and outputs  
53.0-53.2, 146.9-147.1, 224.1-224.3,  
449.1-449.3 and above 1215 MHz.  
Comment deadline is May 15. More  
information will appear in April QST  
AR

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## REPEATER NEWS

We quote from a card received from  
Bill Hendrix, Comm. Systems Asso-  
ciates, Bellevue: "Hi Hank (Dworak),  
on weekends we monitor your  
repeater on our CE-3 demo unit.  
Keeps you honest. Hi Hi. 73s Bill."

(Ed. Note: Check for the repeater  
fund was also enclosed. Thanks, Bill.

Thanks also to William G. Oswald,  
WAØDVK, for his recent contribution  
to the repeater fund. It now totals  
\$86.50.)

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## UNDERSTANDING TRANSISTORS

by Jim White

Associate Member, M. E. M. E.

### Lesson Eight

#### BIASING:

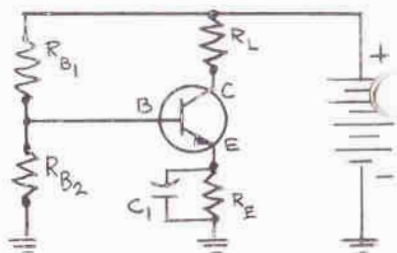
Transistors, in common with vacuum tubes, require bias (base potential) to determine their operating point. The biasing of transistors, however, is somewhat more complex than that required for tube operation. The reason for this is that the transistor bias also provides automatic protection against thermal runaway.

Transistors are temperature-sensitive devices; the conduction and also gain of the device increases with temperature. Increased current flow in turn produces higher temperatures, and a progressive thermal runaway condition can develop. Proper biasing techniques produce a DC feedback loop which automatically reduces current flow when temperature rises.

A common method used to provide thermal stability without objectionable loss of gain is by an additional resistor in the emitter circuit. Increase in collector current will also cause increase of emitter current. The increased drop across the emitter resistance effectively reduces the voltage available for base bias by the voltage-dividing action of the bias resistor and emitter resistor. Normally the emitter resistor is by-passed with a large capacitor to prevent signal degeneration. This method of obtaining bias is analogous to the biasing of a tube through use of a cathode resistor.

The biasing circuit shown below provides good thermal stability and is

suitable for most transistor applications.



(In case those of our readers who have been absorbing Jim White's information on transistors have forgotten the source, it seems proper to repeat that the lessons are regularly mailed to SKIP by Ken Henson, WB6TTP, of the Tulare County Amateur Radio Club, in connection with their monthly "newspaper," THE GRID LEAK. — Ed.)

de Fresno Log

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#### REGARDING "TAIL ENDING"

The FCC warns that the last transmission of an exchange of transmissions must have both called and calling stations identifications. In addition, the transmitting station's call sign must be the last to be given, as: "WXYOU this is WXME."

This also brings up another interesting little item which was called to our attention by Clark Hatch, KØKED... have you ever noticed that there are no "X" calls list? While we can speculate, we are not sure of the correct answer. Will someone clue us in?

de Ham Monitor

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## TECKNICKLE TOPIX (frm Florida Signal Report)

### 100/10 KHz SECONDARY FREQUENCY STANDARD

This paper describes a simple and inexpensive secondary frequency standard built around state of the art components. Heretofore most frequency standards used a pulse synchronized 10 KHz multivibrator to produce accurate 10 KHz markers throughout the high frequency spectrum. Occasionally, some difficulty is experienced in obtaining proper synchronization of the multivibrator and in addition, as components age, long term stability is less than satisfactory. Utilizing digital techniques, all adjustments are eliminated and long term stability is excellent.

The circuit is designed around two, fourteen-pin dual inline pack integrated circuits in common use today. One of these is a decade divider (P-1 on the schematic) and the other (P-2) a dual buffer; that is two similar buffers in the same package. The prototype unit was built with a decade divider manufactured by Texas Instruments Incorporated, but Motorola Incorporated offers a similar device at a slightly reduced cost. The pin connections are different for these devices as indicated on the schematic diagram.

Transistor Q-1 is a crystal controlled oscillator, the output of which is coupled via C-2 to a squaring amplifier, Q-2. The output of the squaring amplifier drives a buffer stage in P-2 which provides additional squaring and a low impedance output, approximately 175 ohms. Pin 6 of P-2

is the 100 KHz output. C-1 is used to exactly tune the oscillator to 100 KHz.

The output of Q-2 is also coupled to the decade divider stage P-1. This stage divides the 100 KHz signal by 10 to produce 10 KHz output which is coupled to the second buffer stage in P-2. The 10 KHz output from the buffer stage is on Pin 8 of P-2.

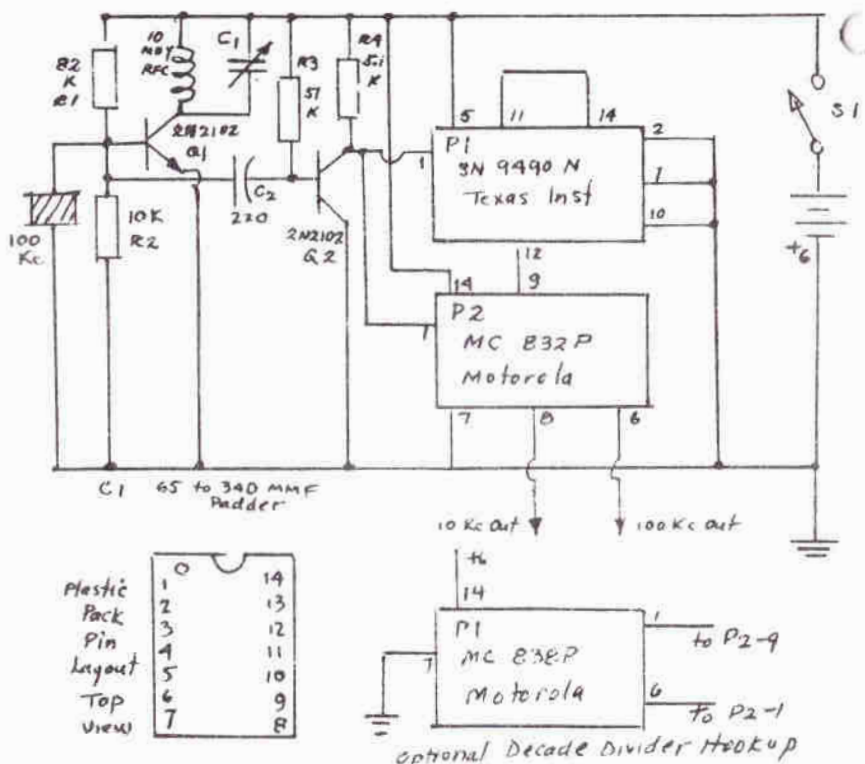
Although 2N2102 transistors were used in the prototype, there are any number of devices which will work equally well. For example, the Motorola 2N4400, packaged in a plastic pack and selling for less than a dollar will prove very satisfactory. However, it may be necessary to experiment with different values of resistance for R-1 and R-2 to assure proper starting of the oscillator.

A good source of voltage for this unit is 3 or 4 series connected pen light cells, the unit operating equally well on either 4½ or 6 volts DC. The full load current is in the order of 35 to 40 milliamperes.

The prototype unit was fabricated on a piece of perforated Vector board 2¾" by 4¾" and assembled in a 5¼" x 3" x 2-1/8" Minibox. No socket was used for the 100 KC crystal, the leads being soldered directly to the pins. Sockets for the integrated circuits were used and are highly recommended to anyone duplicating the unit. The layout is not particularly critical and any convenient arrangement of the components will be satisfactory. One word of caution concerning the integrated circuits; do not solder to the socket pins with the I/C packs in place. The crystal and batteries are held in place with small quantities of Dow-Corning RTV.

Performance of the standard is excellent. The 10 KHz marker signals were equal in strength to those produced by a vacuum tube type standard, being audible through 30

MHz. At 50 MHz the 100 KHz markers are still identifiable, although the 10 KHz were almost buried in the noise level of the converter used.



Gerald A. Fasse, W8UCI

Editor's Note: After Jerry presented a talk at our March meeting on the subject of integrated circuits, your Editor decided to tempt him with a small sized 100/10 kc calibrator using two transistors, taken from an old issue of the C-D Capacitor. A week or

so after getting the old circuit, Jerry showed up with the above article — complete with working prototype in a mini-box!

de Orange County  
Amateur Radio Club

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### EXAMINATION SCHEDULE

All classes of Commercial, General, Advanced and Extra Class Amateur License Exams are given on Thursday 14

and Friday of each week except holidays. When a holiday falls on Saturday the office is closed the

preceding Friday. Applicants must appear between 8:30 and 11 a.m. — Room 1701 Federal Building, 601 East 12th St., Kansas City, MO. 64106. If for sufficient reason applicant cannot appear for examination at the time scheduled above, an examination of any class may be taken by requesting an appointment for another time except on Saturdays, Sundays or Holidays.

WICHITA, KS. Commercial exams will be given March 10 & September 22, 1970. Amateur exams will be given March 11 and September 23, 1970.

OMAHA, NB. Commercial exams will be given Jan. 13 & 14, Apr. 14 & 15, July 14 & 15 & October 13 & 14. Amateur Exams will be given Jan. 15, Apr. 16, July 16, & October 15, 1970.

Omaha and Wichita exams will begin at 9:00 a.m. Examinations at all points except Kansas City will be given by appointment only. Fees will not be accepted at time of examination. Mail your applications and required fee to the KC office at least 2 weeks prior to examination. (The amateur examination fee is \$4.00 for all classes.)

de Ham Monitor

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**OFFICIAL BULLETIN NR 264  
FROM ARRL HEADQUAR-  
TERS NEWINGTON CONN  
MARCH 12 1970 TO ALL  
RADIO AMATEURS BT**

Attention Canadian amateurs. In connection with the Australis Oscar 5 amateur satellite experiment, third party communication has been authorized between Canadian amateur stations and Australian amateur

stations on matters relating to satellite experiments. These arrangements, which are effective immediately, will continue for a period ending four months after the satellite ceases to transmit. The two meter beacon of the satellite has ceased transmissions due to low battery power. The 29.450 MegaHertz beacon is now turned on for continuous operation. Modulation of the 10 meter signal has been much lower than nominal. Details of the launch will appear in the April issue of QST AR

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**OFFICIAL BULLETIN NR 266  
FROM ARRL HEADQUAR-  
TERS NEWINGTON CONN  
MARCH 26 1970 TO ALL  
RADIO AMATEURS BT**

A bulletin transmitted in February advised that Western Union facsimile equipment would soon be available through selected affiliated clubs. Late advice from W3PYW who is handling this for ARRL indicates WU is reorganizing surplus disposal channels causing a minor delay. However, both fax and teleprinter gear will again be released in the near future. Meanwhile W3PYW is firming up appropriate arrangements with selected clubs to assure equitable distribution. Please do not write or call ARRL or W3PYW. When arrangements have been completed another bulletin will be issued with further details. It is hoped that an article on conversion of the available desk fax units can be run in an early issue of QST AR

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**Mark your Calendar** **MAY 2, 1970**  
**9 A.M. - 5 P.M.**

COME TO  
**WORLD RADIO'S**  
**"HAM'n'CB**  
**Jamboree"**

Visit the factory exhibits of Swan, Drake, SBE, Ameco-Gonset, Galaxy, Hy-Gain, New-Tronics, Spaulding, Collins, Petersen Radio, RayTrack and others.

- Over \$3,500 in PRIZES to be GIVEN AWAY!
- Special Money-Saving, One-Day Prices on Ham and CB Equipment (for anyone).
- Your chance to meet the friends you talk to on the Air!
- Your chance to meet factory reps and see new equipment on display!

No registration fee. Your valid F.C.C. Ham license, in your possession admits you and your family... makes you eligible for the prizes. (Ham license for Ham prizes and CB license for CB prizes).



**WORLD RADIO**

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