



HAM HUM

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No. 5

May 1976

NEXT MEETING

WHEN: FRIDAY, MAY 14, 1976

TIME: 7:30 P.M.

WHERE: NATIONAL GUARD ARMORY
6929 Mercy Road, Omaha

PROGRAM: EUGENE B. (GENE) SHAW, Operations Coordinator for Research and Development, Public Works Department, City of Omaha, will give the slide presentation that was prepared as the result of the May 6th, 1975 tornado for showing not only to local organizations but throughout the State and possibly nationally, wherever it can be useful as a training tool.

We are familiar with the activities of the Amateur and React, and while we were busy with our communication problems, many other things were going on. This presentation ties the whole problem together and includes all the services that were involved, not only at the time of the emergency but in the later clean-up period.

As amateurs we can benefit by understanding the problems of a city in disaster and how each group responded to its own purpose.

See you there!

* * *

VISITORS WELCOME - REFRESHMENTS - EYEBALL QSOs

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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 Post Office Box 291
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 Editor: Dick Eilers, WØYZV
 Phone HOME: 397-3999
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 Associate Editor: John Snyder, WØWRT
 Phone HOME: 556-1538
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Deadline for June issue is May 21

New member initiation fee\$1.00
Quarterly for balance of year:	
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AUCTION PLANNING

At the last regular meeting of the Board of Trustees considerable time was given to discussing the recent auction. The purpose was to establish a list of suggestions for future auction committees while the problems of the auction recently held were fresh in everyone's mind. The items suggested here are not to be considered rules of the next auction but will certainly be considered.

With the number of items sold, the total amount bid, and the number of people, the auction should be considered successful even though there were problems. The following in random order, while not attempting to enumerate the problems, will perhaps give greater satisfaction to seller, buyer and Club administration. Should you have any thoughts concerning these or additional items, please deliver them to any officer or Board member or send them to P. O. Box 291.

1. Possible morning starting time with break for lunch. (Total time of auction could be reduced to prevent this necessity. See later items.)
2. Check-ins will begin precisely at time advertised.
3. Items will be positioned on tables in precise order of check-in and auction will follow that order.
4. All items auctioned to be paid for and delivered to buyer immediately (10 minutes).
5. Minimum bid to be established to save time of auctioneer.
6. A 10% contribution to Club on bid price to \$200.00 maximum instead of \$100.00.
7. Consider flea market at different time of year to allow disposal of low value items rather than at the auction.

APRIL MEETING

By—Tom Thiessen, KØPQR

The April meeting was held at the National Guard Armory on April 9, 1976. I hope everyone enjoyed the fresh air while we waited until a key was picked up to let us into the building!

The meeting was called to order at 8 o'clock and the first order of business was to welcome the following new members into the Club: Dave KØJBL, Mac WAØBMJ, John WAØMRH, Jack WNØOXT, Don WNØKXF, Russell WØFWD, Scott WBØSJE, and Gerald Grimes (no call). Congrats to all!

A brief discussion of the problems surrounding the Club auction last month was held. Obviously this was the largest auction in Club history. The last man out the door was at 10 P.M. The subject of what to do next year will certainly be a topic of conversation for some time to come. If any of you have any ideas, please contact any Board member.

John Gebuhr, WBØCMC, introduced a piece of proposed legislation he intends to get passed in Lincoln. It deals with the possibility of having your call sign on your driver's license. Because the Club cannot participate in any lobby effort, anyone interested in the details may contact John directly.

Bob Lockwood, WAØDHU, reported on the possibility of a summer code and theory class. Bob is short just one volunteer instructor to make the program work. Come on guys, let him hear from you!

A reminder that Field Day is coming up soon. Anyone interested in being a shack ramrod should contact
May 1976

Jim Howard, K5TNP/Ø or President Ed, WBØBCB.

The program for the meeting was presented by John E. Bruckner, WAØMRH. Although John is a brand new Club member, he is the Senior Communications Operator for the 911 Emergency Center, and has been deeply involved with VHF propagation for several years. John's presentation of a subject most of us know little about was outstanding. Those lucky enough to attend this meeting were given a complete understanding of propagation ranging throughout the frequency spectrum. The handout literature explaining the WWV propagation broadcasts was most appreciated. Special thanks to WØEKB for his help in obtaining these. If the call WAØMRH isn't familiar to you, it's because John is one of the last holdouts on six meters. Look for him on 50.110 SSB almost every evening or catch his reports in the "World Above" column in QST. Thanks again, John, for a very educational program!

NEXT TRANSMITTER HUNT

Sunday, May 23, 1976 — 1:30 P.M.

Frequency: 146.52 MHz

NEEDED FOR CONVENTION

Need old tubes for use in centerpiece decorations for 1976 Midwest Division Convention. Please bring to next meeting.

Jan Sinram
(XYL of WBØBOR)

1976 CODE AND THEORY CLASSES

By—Bob Lockwood, WAØDHU

The Ak-Sar-Ben Amateur Radio Club, Inc. 1976 Code and Theory Classes have drawn to a close with fantastic results.

The novice class was outstanding with 31 students confirmed who have successfully taken their novice code exam and are patiently waiting for the theory exam. About 20 students have had their big brother or other ham give them their code exam. Approximately 50 students have passed their code test.

The general and advanced class came to an end with approximately 20 students attending. The FCC exam will be April 22nd. It looks like an army of students from this class will be invading the poor FCC examiner. We sincerely wish them the best of luck when they take their test.

The success of the classes was due to several factors. First, we had a fine student body this year. It was lots of fun to work with these people.

Second, we had an outstanding instructor staff: Bob, WBØLYU; John, WBØMKN; Lloyd, KØDKM; Mike, WBØBMV; Tom, WBØLKE; Jim, WBØQGV; Joe, KØKES; Harold, WAØORC; Steve, WAØGQG; John, WBØMFL; and Bob, WAØDHU. A really dedicated group who gave their all to these classes.

Third, but certainly not least, the big brother movement. This gave Club members a real chance to share in code and theory classes. Total Club involvement! The behind the scenes work these people performed was a

major contributing factor in the success of the classes.

Fourth, the privilege of the use of the facility at Creighton Prep. Here is an ideal place to hold the classes. The facility included several classrooms, one large one capable of handling a large class. We wouldn't be where we are today in the growth and development of the classes were it not for this facility. The management of Creighton has a big share in the growth and development of the student body of this class. We thank the management of Creighton Prep for the privilege of the use of this facility.

From year to year the classes are further refined and this year has been a major milestone in the development of the classes. The code and theory classes are a major part of the growth of the Ak-Sar-Ben Amateur Radio Club, Inc. Therefore, total involvement of the Club is essential. This year with the expanded instructor staff and the development of the big brother program, more people have been reached, more goals have been reached, and more people join the amateur fraternity.

Watching the Skiers

Making their first trip to the famed Florida's Cypress Gardens from their home deep in the Everglades, two Seminole Indians stoically watched the water skiers roar up and down the lake.

"Why makum motorboat go fast?" asked one.

"Have to," replied the other, "Little man on string chase um."

Karem Karavan

MEMBERS NEWS

Omaha, Nebraska
April 12, 1976

Ir. Ed Eichler, WBØCBC,
President, Ak-Sar-Ben
Amateur Radio Club,
Post Office Box 291,
Omaha, Nebraska 68101

Dear Ed,

I wish to thank you and the entire membership for the get well card you sent me during my recent hospitalization. It helped greatly to shorten some of the long days one experiences while "institutionalized."

I can best summarize my feelings by quoting a comment my roommate made when he saw the card. He said, "It sure must be nice to have friends like that." Indeed it is!!! It's great to be a ham!!!

Sincerely,
Don Taute, WBØPGS

April 11, 1976

Ak-Sar-Ben Amateur Radio Club, Inc.
Omaha, Nebraska

Enclosed find my late dues. I have been in the process of moving and changing jobs. I have moved to Beatrice, Nebraska, and am living in a temporary location as the house I purchased had a 75-day possession date. I am sending my new address that will be effective after June 1, 1976; all other correspondence will be

forwarded from my old address in Council Bluffs, Iowa.

I am leaving some fine amateur friends behind in the Metropolitan Omaha Area. I hope some of the fellows don't forget Leo, KØJIU; he has his hands full with the 22/82 machine. (The ID has been inoperative for several weeks. Can't one of the fellows who is technically able give Leo a hand?)

I did one thing that was quite different from the old location (more commonly known as Zero microvolt valley). My new location has a 1300 foot elevation, and I am planning to put up the old 100 foot tower, with equipment on the VHF frequencies. Hope to work into Omaha and Kansas City and the other locations around as I think I will be right in the middle of some available VHF activities into these areas.

I am working at the local radio station (WKBE AM and FM) and also commuting back to Omaha to take care of two stations in the Omaha area. So, you might be hearing from me on a mobile basis when I get a chance to install the mobile rig in the new car, as I have just traded cars recently.

I am retaining my membership in the Club as I will be in town two days a week (usually Thursday and Friday) and plan to try and attend some of the meetings.

Well, with some luck I will probably be talking on the ether waves around June 15 if I get my station set up again.

James C. Droege, WØYCP

LEGISLATION TO BE PUT BEFORE THE NEBRASKA LEGISLATURE

April 5, 1976

WHEREAS Amateur Radio operators have proved their value to the communities in which they live by providing communications for various organizations, charitable and otherwise, and in time of disasters; and

WHEREAS the number of thefts to auto contents is mushrooming and people other than Amateurs can drive a car with the call sign on the license plate, it identifies the person rather than the vehicle; and

WHEREAS an Amateur's call is one of a kind and identifies him as a communicator by virtue of his hobby; and

WHEREAS the Amateur is, in general, a responsible individual in that the tests he must take to get his license are difficult and require a lot of preparation.

THEREFORE, we do hereby petition that an Amateur operator be able to have his call as the serial number on his driver's license (in like manner as his car). And, in addition, on showing his amateur license to the Drivers License Bureau, be able, with a \$10 fee and all other requirements, obtain a driver's license to run concurrently with his amateur license for a term of 5 years, beginning 3 months after the date of issue of his amateur license and expiring 3 months after his amateur license.

(Comments and criticism should be sent to John Gebuhr, WBØCMC, 2340 North 64 Street, Omaha, Nebraska 68104.)

Ak-Sar-Ben Radio Club
Mr. Rick Stansbury
Coordinator - 1976 Omaha Open
9348 Camden Ave.
Omaha, Nebraska 68134

Dear Rick:

Spring is here and it is time to start thinking tournament once again. The Carter Lake Water Ski Club wishes to sincerely thank you and the Ak-Sar-Ben Radio Club for their work at the highly successful 1975 Omaha Open Water Ski Tournament. Ak-Sar-Ben Radio Club was most helpful and very necessary. Their presence at the site took a great load off our minds. They did a most outstanding job and we greatly appreciate their assistance. Without them we could not have had such a successful tournament.

We would appreciate it if your club would consider working our 1976 Omaha Open Tournament, September 4th & 5th, 1976. If your club will work our tournament we will try to get T.V. and newspaper coverage so that your club will be recognized.

Thank you very much.

Sincerely,
Walt Peterson,
Tournament Chairman
Bud Piercy - Chief Judge

(Ed. Note: This project has been approved by the Board and Rick, WAØROP, is in charge. We plan to use 52 simplex for the event. Please contact Rick for more information.)

ADDITIONS TO ROSTER

Johnny R. Baria, K5QKT
#36 - 3rd Avenue
Trailer City
Council Bluffs, Iowa 51501
Phone: 366-2683

Sandra Baria
(XYL of K5QKT)
#36 - 3rd Avenue
Trailer City
Council Bluffs, Iowa 51501
Phone: 366-2683

John E. Bruckner, WAØMRH
6415 Franklin Street
Omaha, Nebraska 68104
Phone: 556-5325

Ronald R. Freeman, WØLPZ
2515 Country Club Avenue
Omaha, Nebraska 68104
Phone: 558-7722

Gerald Grimes
3124 Cottonwood Lane
Omaha, Nebraska 68134
Phone: 572-8290

Jack Mann, WNØOXT
Route #2
Plattsmouth, Nebraska 68048
Phone: (402) 298-8526

Dave McLaughlin, KØJBL
5814 South 96th Court, #144
Omaha, Nebraska 68127
Phone: 331-6741

Garland (Mac) McLaughlin, WAØBMJ
7531 Spring Street
Omaha, Nebraska 68124
Phone: 393-0432

Edward C. (Casey) Smith, WA6GKH
507 Chateau Drive, Apt. #8
Bellevue, Nebraska 68005
Phone: 291-3043

Donald Sudduth, WNØKXF
2810 North 78th Street
Omaha, Nebraska 68134
Phone: 393-1972

Russell E. Woodward, WØFWD
4913 North 56th Street
Omaha, Nebraska 68104
Phone: 453-3911

ANNOUNCING 1976 SPRING CODE AND THEORY CLASSES

The Ak-Sar-Ben Amateur Radio Club, Inc. will sponsor classes for novice privilege beginning at 7:30 P.M. on Tuesday, May 18, 1976 and continuing every Tuesday and Friday evenings for approximately ten weeks. Classes will be held at the Radio Engineering Institute, 2960 Pacific Street, Omaha. Text: ARRL License Manual and "From 5 to a Kilowatt." Instructors: Chuck, WBØNVL; John, K5QKT; and Richard, WBØZQG.

Bob Lockwood, WAØDHU
Chairman Education Committee

ANY INTEREST?

Anyone interested in starting a computer hobbyist club/information exchange, contact WBØNPS, Bill Dumbleton, 4607 Chicago St., Omaha, NE 68132; phone 551-0577.

HAMFESTS (AND CONVENTIONS TOO)

Why are hamfests suddenly becoming so popular? Why, this year alone, there are three hamfests scheduled for the greater Washington DC area. Hams in Hampton and Richmond are thinking about sponsoring new hamfests. The UVA Club is thinking about sponsoring a hamfest in Charlottesville.

When I was first licensed in 1967, the only Hamfest in the area was the Winchester Hamfest which had an attendance of about 700 and the Gaithersburg Hamfest which boasted an attendance of around 1200. Today, including the Roanoke Hamfest and the Raleigh NC Hamfest, I bet I could easily attend 15 different events. In the Washington DC area there are at least 6 or 7, including several small ones in the Baltimore area.

Not only has the number of hamfests increased, but the attendance of the older hamfests has dramatically shot up. Winchester Hamfest, I have been told, has grown so large it can no longer be held in the armory. Gaithersburg is expecting around 3500 this year.

Why??? Certainly, part of the reason is economic. With inflation, where else can one go for real down-to-earth ham bargains? But I cannot accept this answer as the total one. Why is it that at a time when the numbers of amateurs are supposed to be on the decline that the hamfests are enjoying unprecedented popularity?

The ARRL has constantly maintained that the numbers of amateurs that are not renewing their tickets are "deadwood." People who got their

ticket years ago, lost interest, and only maintained their license because of sentimental reasons. When the price of renewal went up to \$9.00 in the early '70s, many of these people decided sentimentality had become too expensive and did not renew. The ARRL says that although the total numbers of amateurs are decreasing, the percentage of active hams IS INCREASING. Judging from the popularity of hamfests, I believe they are correct. What do you think?

by Phil Sager, WB4FET
via ARNS

A young woman says she is putting all her money in taxes because it is the only thing that is sure to go up.

— Service

LETTER OF APPRECIATION

March 30, 1976

Edward C. Eichler, President
Ak-Sar-Ben Amateur Radio Club, Inc.

Dear Ed:

I wish to say thank you for the effort and dedication of all who work in amateur radio.

Special thanks to the instructors of the code and theory classes. I have never met finer people! I really cannot tell you how much the experience of this class has meant to me.

Sincerely,
Bennett Kutler
5817 Charles Street
Omaha, NE 68132

FM NEWS and VIEWS

by Gary Hendrickson, W3DTN
from Auto-Call, December 1975

I would like to quote and rephrase from a recent bulletin of the Dallas ARC:

When you transmit on a repeater input frequency, all stations monitoring the output frequency hear you...they have the following options for their response:

1. Listen to you without answering.
2. Switch to another frequency.
3. Turn off the rig.
4. Answer you and carry on a conversation.

REMEMBER, this is what their response means: 1) They don't want to talk to you. 2) They don't want to listen to you, either. 3) They don't want to talk OR listen to you, but they cannot switch. 4) All stations that did NOT answer or switch are still hearing YOU AND THEM! The latter group includes the control operator of the repeater.

There are probably dozens of listeners for every talker on the repeaters. Please keep your QSO's short and to the point, especially during the morning and evening rush hours.

Don't assume that all listeners want to join your QSO even if you transmit an invitation for them to do so. Also don't even assume that they enjoy coming to your QSO! DO use the repeaters! But DON'T tie them up for extended periods when other users may be waiting to use them for more productive purposes!

de Ra Ra Rag, Rochester, N.Y.

May 1976

HAM HUM

SIGNALS

We have been doing some listening around to the various nets that operate here in Nebraska and the adjoining States. One of the things that I cannot understand is the "tuner upper" that makes his appearance about ten to fifteen minutes before net, does his little tuning and then without any identification stands by for net. Read Section 97.123 of the FCC regs about this. Then after the net gets under way, along comes the late "tuner upper" and does he move away from net frequency, no or at least only a Kc or so and manages to put his carrier right on net. Again take a look at FCC regulation 97.125. Most Hams that check into nets use the same antenna and should know about what his dial should read to be tuned to the net frequency without having to go through the routine of tuning. With band conditions such as they are, the poor old net control needs all the breaks that he can get to do his job. A little help sure would make it a more pleasant job.

de LOGIC, Central Neb. A.R.C.

RECENT CONTRIBUTORS

Repeater 34/94

Edward F. Askew, WAØRDZ &

Marjorie E. Askew, WAØRDY

Charles A. Michel, KØQVL

Sincere thanks to each of you!

The reason why some people get lost in thought is that it is unfamiliar territory to them. — Service

Page 9

UNBALANCED FEED OR HALF-WAVE ANTENNA

By Carl Drumeller, W5JJ

An oft-repeated claim is made that center feeding a dipole antenna directly from a coax line causes one half of the dipole to be grounded (to RF), thereby negating the radiation from that portion. Such claims display a deplorable ignorance of antenna behavior! A dipole has a standing wave (not to be confused with, but caused by traveling waves) on it as shown in the drawing. This holds true regardless of whether the exact center-point is grounded or insulated from ground.



A quarter wave inverts the impedance seen at one end. If the "end" at the center is grounded, the far end displays very high impedance, which supports the voltage maximum point. All "plumber's delight" beams are constructed to utilize this principle, as are the quarter-wave "metallic insulators" used in SHF transmission lines.

In short, having the precise center of the dipole grounded has utterly no effect upon its RF voltage or current distribution. A tiny off-set of the center, caused by the spread of a center insulator, effects detectable but totally inconsequential imbalance of RF voltage (and current) distribution. The fact can be demonstrated readily by use of RF "sniffers." See Ham Radio, May 1973, page 24.

-from PEARL NEWS and
COLLECTOR & EMITTER

AMATEUR RADIO SERVICE GROWING AGAIN

By Vic Clark, W4KFC
Vice President, ARRL
in Auto-Call, Feb. 1976

For the first time in several years, a growth trend appears to have been restored to the amateur radio population. FCC figures show an overall gain in the Amateur Service of 256,264 to 260,091, from March 1 to December 1, 1975. Conditionals are down 1045, Generals are down 2526, while all other classes are up, led by Advanced with an increase of 4105. While the overall increase (3827) is a small percentage of the amateur body as a whole, it is in the right direction. Much of the credit for this encouraging development undoubtedly belongs to clubs and individuals sponsoring training courses for new amateurs! de OFF RESONANCE,
March 3, 1976

A hobo wanting to earn a bite to eat stopped at a farmhouse along the road.

The farmer's wife told him, "If I thought you were honest, I'd let you go into the chicken house and gather eggs."

"Lady," the hobo replied, offended in his integrity, "I was a janitor of a shower room for 15 years and I never took a bath."

The Ansars

A reformer is someone who insists on his conscience being your guide.

- Service

HAM HUM SWAP

FOR SALE: Air-O-Ear Model 710 WN VHF aircraft communications band rcvr.
108-130 MHz.

Craig Hinton, WBØIAH; phone 895-1419,
5004 Amy Circle, Omaha, NE 68137

FOR SALE: Left over from auction. G.E. Voice Commander, crystallized
146.34/94. Needs work on audio section. With battery pack and
charger.

Call KØQVL, Charles Michel, 8720 Charles St.,
Omaha, NE 68114; phone 391-3782

WANTED: Collins KWM-2, KWM-2A, or S-Line; have cash.
WBØPAY, Jerry Gunsolley, 1705 S. W. 15th,
Lincoln, NE 68522; phone (402) 475-7563

FOR SALE: Hy-Gain Model 2BDQ Doublet Antenna for 40 and 80 meters, with
balun, etc.

Bernie Chap, WBØEYT, 4656 Harrison St.,
Omaha, Nebraska 68117; phone 731-0128

FOR SALE: Motorola Business Dispatcher converted for two meters, with 34/94,
22/82, 16/76 and 52 simplex crystals.

Steve Baily, WAØGQG; phone 333-2698

STOLEN: April 7, 1976 from 501 North 17th. Heathkit HW-202 with
homemade scanner installed. Distinctive by 7-seg. display
immediately left of S meter (or ¼" hole where it was).

WBØNPS, Bill Dumbleton

HOMEBREW ANYONE?

How would you like to demonstrate your home-built pride? Well, you can at the
'76 ARRL Midwest Convention. All that is required is that your project is of your
own design (not a kit) and that you have a page or so written up on it (how it
works, etc.). There will be a prize (according to how many entries received)
awarded to the best presented project.

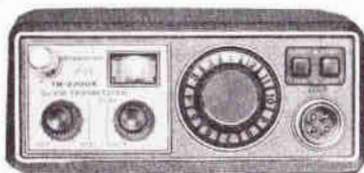
There will be a small \$1.00 entry fee charged. For info call:

Jim Peterson WBØQGV 558-0643

Jon Penner WBØGQT 571-5076

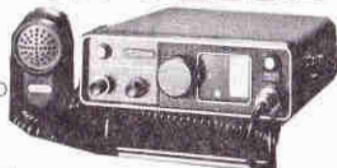
BOTH SETS INCLUDE THESE CRYSTALS (*): 146-94/94, 34/94, 52/52, 16/76, 22, 82, 28/88

EITHER WAY IS OK! THEY'RE BOTH 2 METER



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*22 CHANNEL
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TR-2200A, THE PICK-UP & GO SET! REPLACES THE LONG POPULAR TR-22, WITH NEW IMPROVEMENTS AND GREATER VALUE! STILL HAS TELESCOPING ANTENNA (BUT NOW QUICKLY DETACHABLE FOR DUCKIE USE ON TOP); 12 CHANNELS (*6 SUPPLIED); TUNED 145/148MHZ. BATTERY SAVING LIGHT SW; HI-LO POWER SW. (400MW & 2 WATTS); OPERATES FROM INTERNAL BATTERIES (NICADS SUPPLIED); INTERNAL CHARGER; OPERATE FROM EXTERNAL 12VDC. SOLID-STATE. SENSITIVITY: 5UV FOR 26DB S/N. RATIO. HAS BUILT-IN SPEAKER, SIZE: 5-3/8" x 2-5/16" x 7-1/8". NET WEIGHT 3-3/4LBS. THIS UNIT COMES COMPLETE WITH SHOULDER CARRYING CASE, DYNAMIC MICROPHONE, ALL CABLES, A SPEAKER/HEADPHONE PLUG AND BATTERIES.

The TR-7200A-PACKED WITH PERFORMANCE AND RUGGED FOR DEPENDABLE MOBILE PERFORMANCE - 146/148MHz COVERAGE WITH 22 CHANNEL CAPABILITY AND 6 CHANNELS (*) INCLUDED! PUT YOUR FAVORITE CRYSTALS IN CHANNEL 7. THE UNIQUE PRIORITY SCAN AUTOMATICALLY RETURNS WHEN THERE IS ACTIVITY THERE.

GREAT FEATURES, LIKE: DUAL POWER OUTPUT OF 10 OR 1 WATT; TRIMMERS ON EVERY CRYSTAL; AUTOMATIC VSWR PROTECTION; ALL SOLID-STATE; 5UV FOR 27DB S/N. SIZE: WHD-7-1/16" x 2-3/8" x 9-7/16" & NET WT. 5 1/2 LBS. OPERATE FROM 13.8VDC. WITH MIKE, MOUNT & SPEAKER PLUG.

PS-5 AC SUPPLY & DIGITAL CLOCK TIMER \$79.00
OPERATES THE TR-7200A (OR OTHER 10 WATT)

TR-2200A-\$229.00
TR-7200A-\$249.00



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TS-700A

AMATEUR RADIO EQUIPMENT



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Operates all modes: SSB (upper & lower)
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THEN YOU NEED THE TS-700A'S BIG FEATURES!

The circuit is completely solid-state for long, trouble-free use. Operates AC or DC from internal supply for home and mobile. Complete coverage: 144-148MHz. Automatic 600kHz offset, up or down; 5 meter/discriminator meter; RIT control; Noise Blanker; Tone Burst provisions; 11 channel crystal selector (each crystal has 3 freq. ie: 146.94/146.34/146.94 simplex); mike & speaker included.
POWER: 10 WATTS FM/CW, 20 WATTS PEP/SSB, 3 WATTS AM

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