



HAM HUM

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1982 President
Walt Brown, KAØDMB

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NEXT MEETING

WHEN: FRIDAY, JANUARY 8, 1982

TIME: 7:30 P.M.

WHERE: HEARTLAND CHAPTER
AMERICAN RED CROSS
38th and DEWEY
OMAHA, NE 68105

PROGRAM: LOU CUTLER, WØVLI —
"YESTERDAY'S AIRPLANES"

THE PREZ SEZ

The Party's over, Christmas is past, and the New Year has started. Resolutions have been made and pages have been turned, so by now we are ready to resume our activities on a New Outlook or perhaps a more polished old one.

And speaking of parties, those of you who didn't make the Club's Annual Christmas Party on December 13th at the South Omaha Boys Club, really missed a good one. Santa had a bag filled with a variety of toys for all the "little ones" in attendance and even took orders for Christmas eve. The kitchen was a very popular place, with all the goodies brought by the ladies. And of course the Club offered its usual good selection of gifts as door prizes.

Our sincere thanks to the Chereck family (Bob, WBØTVP and his XYL, Leona) for not only securing the gathering place, but also to Santa and his helper (Danny who helped with the drawing). Make plans NOW to attend the next one.

I do hope that everyone had "Happy and Blessed Holidays" and that by now are keeping all those resolutions made on New Years eve. I have resolved to "share myself" in any way I can with those with whom I come in contact and I sincerely hope by example it may become contagious.

Bob, WAØDHU, and his crew have already started their "sharing", as Code and Theory classes have gotten off to a flying start at Boys Town - anyone

interested can call Bob Lockwood in the evenings.

John, WBØCMB is still researching his project for Cable TV. Call John if you want to get in on the act.

Plans are already underway for the Club Auction; Field Day is just around the corner and before you catch your breath, Summer will be here. Your new Executive Committee has several "thought provoking" ideas they will be sharing with you in the future. I would ask that perhaps if you have any ideas, suggestions or programs you would like to see, please let them be known as we will be trying to make your Club more enjoyable for each of you.

Finally, as I look at all the various Club Committes, I see as much diversity as there are Azimuths or directions in a circle. These committees exist for your use, so that no matter in what "Direction" you proceed you can always find help. Don't hesitate to call on them in case of need.
73's

de Walt KAØDMB

"I know no way of judging the future but by the past"

- Patrick Henry 1775

PAST PRESIDENTS OF THE CLUB

1945	Nels Peter Nelson, W7RCF (Ex-W0YDC)
1946	John F. Leeder, W0UFD
1947	Arthur R. Gaeth, W0FQB
1948	Herbert D. Curry, W0QXR
*1949	Elmer N. Stein, Ex-W0AVM
1950	Dr. Leon Becker, W6AID (Ex-W0BBX)
1951	Earle E. Olson, W0JKE
1952	John W. Orr, W0PHW
*1953	Rev. R. J. Strange, W0QHG
1954	Frank W. Cooper, W3NV (Ex-W0IOS)
1955	Arthur E. Sadler, W9KHD (Ex-W0QMD)
1956	Dick L. Eilers, W0YZV
1957	Curtis D. Hicks, K0AMM
1958	Edward Gutmann, W0CQX
1959	David A. Hollander, W6COJ (Ex-W0CJW)
*1960	Max N. McKinney, W0YVV
1961	John A. Droescher, K0KWB
*1962	Royal M. Enders, K0LYQ
1963	Joseph F. Berounsky, K0QDB
1964	Louis A. Cutler, W0VLI
*1965	Edmond E. Donze, W0YEV
1966	Byron J. Smith, Sr., WA0ICK
1967	Ervan D. Heinz, WA0EEM
1968	Robert C. Lockwood, WA0DHU
1969	Royce E. Johnson, WA0KIL
1970	Harold E. McClenahan, Jr., WA0DGA
1971	James C. Droege, W0YCP
1972	Edward F. Askew, WA0RDZ
1973	Russell A. Minks, WA0VEE
1974	Vernard Riortella, WA2LQQ (Ex-WB0GAJ)
1974-75	Marion Wilczynski, WB0BMV
1976	Edward C. Eichler, WB0BCB
1977	Robert A. Conley, WB0LYU
1978	James R. Peterson, WB0QGV
1979	Thomas L. Theissen, K0PQR
1980	Richard D. Jugel, K0DG
1981	James B. Wilson, WB0JPN

*Deceased

MINUTES OF THE GENERAL MEMBERSHIP MEETING held December 11, 1981, at the Red Cross Building, 38th and Dewey Avenue, Omaha, Nebraska

The annual meeting of the members of the Ak-Sar-Ben Amateur Radio Club, Inc., was held on December 11, 1981, at the Red Cross Chapter House at 38th and Dewey Avenue, Omaha, Nebraska. The meeting was called to order at 19:30 hours by President James Wilson, WBØJPN, a quorum being present.

Meeting began with the Pledge of Allegiance. Name and call identification were given. There were three visitors. New member — Robert W. Hall, NØDGC.

Motion by James Stanford, NØAIH, to dispense with the reading of the annual minutes was seconded by Thomas Thiessen, KØPQR, and was approved.

The Treasurer's report was read by Richard Fehrman, KAØAAB. Motion made by Dick Eilers, WØYZV, and seconded by Mitchel Gagne, NØAZF, that the report be approved as read. Motion carried.

A repeater report was given by John Gebuhr, WBØCMC.

President Wilson then asked Dick Eilers if he would please come to the podium and give the report of the Nominating Committee, wherein the following were nominated for the office named:

For President
For Vice President
For Executive Council

Walter J. Brown, KAØDMB
William H. Martin, NØANQ
Frank D. Bruner, KØSST
Raymond E. Fink, WDØGIL
Fred C. Genovesi, KAØKDJ
Lysle A. Renne, NØCKH

President Wilson then announced that first to be elected was the President and called to the attention of the members that further nominations from the floor were in order. There being none, motion was made by Bob Conley, WBØLYU, and seconded by Robert Lockwood, WAØDHU and carried that the Secretary be instructed to cast a unanimous ballot for Walter J. Brown, KAØDMB, for President.

President Wilson then called for nominations for Vice President from the floor. John Gebuhr, WBØCMC, named Gerald W. O'Harrow, WBØPPF, to be placed in nomination. Motion by Robert Lockwood, WAØDHU and seconded by Edward Hofmann, WDØHBY, that nominations cease.

President Wilson then appointed a committee of two, Russell Minks, WAØVEE, and Douglas Halbert, KØBOY as tellers to collect and count the vote. While the votes were being counted, he called upon Robert Lockwood, WAØDHU, to report on the Education Committee.

Russell Minks, WAØVEE, then brought a report of the election results

motion to adjourn. Motion made and seconded that the meeting be adjourned at 21:45 hours.

Doughnuts and coffee followed.

Ellen Morrissey, WBØHWF
Club Secretary

ADD TO ROSTER

Thomas D. Mickus, WBØWKI
1160 Hancock Drive
Boulder, CO 80303
Phone: 303-442-7971

Nancy Genovesi XYL of KAØKDJ
7714 North Ridge Dr.
Omaha, NE 68112
Phone: 455-7051

NEW MEMBERS

ADDITION TO ROSTER

Jim O. Wolfe, KAØMHM
14017 Weir
Omaha, NE 68137
Phone: 895-3271

Robert W. Hall, NØDGC
1705 N. 94 Plaza
Omaha, NE 68114
Phone: 397-2833

1982 BOARD OF TRUSTEES

President	Walter J. Brown, KAØDMB	1982-83
Vice President	William H. Martin, NØANQ	1982
Past President	James B. Wilson, Sr., WBØJPN	1982
Executive Council	Richard L. Fehrman, KAØAAB	1982
	Mitchell H. Gagne, NØAZF	1982
	D. C. "Chuck" Hoffman, WBØNVL	1982
	Lysle Renne, NØCKH	1982-83
	Raymond E. Fink, WDØGIL	1982-83
	Fred C. Genovesi, KAØKDG	1982-83
	Frank D. Bruner, KØSST	1982-83
	Replacement for unexpired term of Walt Brown will be presented to the members for approval.	

and President Wilson announced that the Vice President would be William H. Martin, NA0ANQ.

The President then announced that nominations were in order for Executive Council whereupon the following were nominated from the floor: Charles T. Peaker, KC0DB; Scott E. Persson, WB0QPP; and Richard H. Swig, WA0ZQG. Motion was made, seconded and passed that nominations be closed. The President then announced that members could vote for no more than four of those nominated and that either the name or call would be sufficient to identify the vote on the ballot.

Russell Minks, WA0VEE, brought a report of the election results and President Wilson announced the following were elected as members of the Executive Council: Frank D. Bruner, K0SST; Raymond E. Fink, WD0GIL; Fred C. Genovesi, KA0KDJ; and Lysle A. Renne, N0CKH.

Thomas Thiessen, K0PQR, read several items from the HR Report.

New Business - John Gebuhr, WB0CMC, — With the cable companies coming to Omaha, we as a Public Service Group, would have available to us the Public Access Channel to use for our code and theory course. We would make a video tape and it would be run two or three times a week in the afternoons when listeners could learn. At the end of the course there would be a quiz. They could send in their answers and a stamped addressed envelope. We would then send back the answers.

Dick Eilers, W0YZV, then made a motion we state our appreciation and approval of the services of all the officers and board members for the year 1981 and that we as members felt they had done a fine job for the year. This motion was seconded and upon being put to a vote was unanimously carried.

Richard Swig, WA0ZQG, spoke of the smoking in our club room. If they must smoke, he said, they should go out in the hall. He declares that at our January meeting there be no smoking in the room. Moved by Parley Applegate, WD0ENB, and seconded by Robert Smith, KD0F, Motion carried.

Thomas Thiessen, K0PQR, asked for the floor and presented to James Wilson, WB0JPN, a plaque indicating appreciation of the Board and Club members of his services for the year 1981 and the members showed their further appreciation by a standing ovation.

President Wilson presented to his "right arm" secretary, Ellen Morrissey, WB0HWF, an Original Designed and Engraved desk set and a personalized stick pin with the Club logo and her name.

President Wilson then presented the gavel to Walter Brown, KA0DMB, the new President, and indicated he had received help and cooperation from the members and board members of the Club and that he was sure Walt would also receive the same kind of help and could look forward to a fine year in 1982.

President-Elect Brown then thanked the members for their confidence in him and indicated he would do his best with the help of all the members, and that his first official duty would be to recognize a

DFD SYSTEMS AMATEUR RADIO TELETYPE SYSTEM

A Development Story
By Dick Jusel, K8DG

One of the most fascinating and enjoyable modes of communication used by Amateur Radio Operators is Radio-Teletype (RTTY). Basically, RTTY can be defined as the transmission and reception of electrical impulses that correspond to the various letters, figures, and symbols of a standard character set. These electrical impulses can be transmitted and received over great distances on "land lines" or high frequency radio circuits.

The popularity of RTTY is rapidly increasing. More and more manufacturers are entering the field with low-cost, high-performance equipment, and the number of technical "How To" articles in amateur publications is increasing. This rise in popularity should continue, especially in light of the Federal Communication Commission's recent ruling to allow the use of the American Standard Code for Information Interchange (ASCII) on the Amateur Bands. The older five-level Baudot Code, although suitable for "Plain text" message traffic, is less than ideal for use with the more modern computer-based RTTY systems.

However, the main reason for the recent upsurge in RTTY activity has been the development of reasonably priced, solid-state terminal and computer equipment. RTTY is now available, at reasonable cost, without the sizable space requirements, maintenance problems, and "noise pollution" associated with the older "mechanical monster" teleprinter equipment. In addition, the legalization of ASCII should attract many more enthusiasts into the RTTY fold, including those with primary interests in computing rather than Amateur Radio (it should be noted here that an FCC operator's license is not required to receive RTTY signals; all that is necessary is a fairly good Amateur Band receiver and a simple tone demodulator).

Recently, general-purpose microcomputer systems have been gaining popularity as RTTY stations, this has led to the development of several fine computer programs dedicated to this purpose, and to the introduction of digitally-controlled modulator/demodulator (MODEM) equipment especially designed to support such operation. The first small computer system of this type to gain widespread acceptance on amateur bands was the Radio Shack TRS-80, which simulates a Keyboard Send/Receive (KSR) teleprinter with the MACROTRONICS M-80 hardware and software interface. There are probably hundreds of these units in use today, and the MACROTRONICS M-800 system is now being shipped to provide limited Automatic Send/Receive (ASR) operation to TRS-80 owners. MACROTRONICS is continuing to improve and upgrade its RTTY hardware and software.

During 1979, DFD Systems performed benchmark tests of the TRS-80/M-80 system. The TRS-80 was a level II disk system with 48K of user-programmable memory. Overall, the system was satisfactory for general amateur KSR use, but left much to be desired for heavy duty traffic handling use.

The system was tested in Navy-Marine Corps Military Affiliate Radio System (Navy MARS) station NNNGZUM (for those unfamiliar with MARS operations, station reliability and performance requirements are similar to those of commercial message service stations). The major problem areas noted were:

KSR operation was completely unacceptable (the M800 system was not available yet). MARS RTTY station operation involves storing and forwarding of significant volumes of message traffic. This is accomplished by using paper tape as the data storage medium with mechanical equipment. The TRS-80 was not able to perform these message-handling functions without still having to use mechanical paper tape equipment in the station's RTTY current loop.

The limit of 64 characters per line proved to be another significant problem in handling MARS traffic. The standard TTY line length is 72, so columnar information would often end up mis-spaced and garbled on the TRS-80 screen.

The unshielded TRS-80, along with its unshielded video monitor, was prone to both the generation and reception of Radio Frequency Interference (RFI). This caused problems in the receiver when trying to copy weak signals, and completely wiped out the CRT

display during transmit. Extensive shielding efforts were necessary to reduce the RFI problems to a barely acceptable minimum.

Because of these problems and deficiencies, the Radio Shack system was eventually used only as a novelty item in the station configuration. No other station equipment could be practically replaced; the teletypewriter and paper tape equipment were still relied upon as much as ever. Therefore, the system could not be cost-justified on the basis of machine replacement or more efficient station operation. The TRS-80 was simply a "frill" that could be removed at any time without adversely affecting station operation. In fact, after several months, the TRS-80 was not even used during traffic runs anymore, since the mechanical machines were less clumsy to operate directly from the terminal unit loop than from the TRS-80 loop.

The TRS-80 system was soon discarded, but the experience gained through it's use was retained. The specifications for an RTTY system that would be suitable for heavy-duty MARS use was formulated, and another phase of hardware selection and evaluation was begun. The decision was eventually made to build a custom computer system from scratch, based on the S-100 bus, when no commercially available computer could be found to fill the bill (not the least of the requirements was that the system must be reasonably priced!).

Then came the Heath announcement of the H19 terminal and the H89 computer! The H8/H9 combination had been evaluated earlier, but discounted because of the restrictions imposed by the H9 terminal. However, the HDOS operating system was very impressive, and would fit the requirements perfectly. The H19, with a professionally-sized 25x80 character screen, was precisely the ticket for RTTY use! The H89 was soon selected for the RTTY project, based on the following points:

The H19 terminal contained all the features that were necessary to support split-screen, full line RTTY displays.

HDOS allowed access to the CPU interrupt facilities, which is necessary to develop a truly "multiprogrammed" facility (The RTTY system must be able to receive and transmit at the same time, which requires full duplex "multiprogrammed" capability).

The 8250 Asynchronous Communications Element (ACE) could be used as the computer-to-MODEM interface port, thus easily allowing full ASCII and BRAUDOT operation with interrupt driven Input/Output capability.

The disk capabilities of HDOS would allow COMPLETE replacement of ALL mechanical equipment! No paper tape punches, readers, or mechanical printers/keyboards would be necessary in the resulting station configuration!

The disadvantages of the H19/H89 system were that the RF shielding was still likely to be a problem, and a custom program would have to be designed and written, since no suitable RTTY programs currently existed for use with HDOS.

With the evaluation completed, an H89 system was ordered in July, 1979. At the same time, design work on the software began. The program would be written in assembly language to conserve memory space and gain access to the CPU interrupt structure, so the actual programming tasks would be fairly complex and time consuming. Therefore, a "head start" in software design would save overall end-to-end development time.

H89 system arrived in September, 1979, and was operational on the first Navy MARS RTTY net in early October. The system has worked flawlessly since then, and has actually replaced all mechanical BRAUDOT equipment at Navy MARS stations NNN0AFL and NNN0ZUM. The floppy disk completely replaces all paper tape equipment, and the H89 itself handles all printer/keyboard functions. All MARS message traffic is received, stored, corrected, and forwarded using only the floppy disk drive.

As expected, however, shielding was a problem. The Heath RFI modification was installed, which helped some, but a steel enclosure instead of the foam cabinet would be a vast improvement. Using standard grounding

and shielding methods, including using aluminum tape to shield the cabinet interior, the RFI problem has been reduced to an acceptable level. Several MARS RTTY broadcasts require output levels in the range of 500 watts, sometimes for more than an hour, so the shielding problem can be critical if not carefully considered.

After extensive reliability testing and functional testing on the MARS circuits, the system was modified slightly to include automatic CW identification and to operate on an HS computer as well as the HS9. The system is now compatible with amateur rules and regulations (MARS does not require CW identification), and is being marketed by DFD Systems for use on the amateur bands with Heath computers and the Heath Disk Operating System (HDOS).

The RTTY program provides full duplex (send-while-receive) capability, both Baudot and ASCII modes, at standard speeds up to 19,200 baud. In addition, a CW transmit-only mode is available, which allows the system to be used as a sophisticated memory keeper. Full ASR capabilities are provided using the system floppy disk as the storage medium. The system console is divided into three sections, with the received data being displayed on the upper part of the screen, transmit and command data on the lower half, and a real time display of actually transmitted information on the 25th line in reverse video (since the transmit buffer may be way ahead of what is actually being transmitted over the air at a given time, the 25th line always reflects, in a "times square" moving display fashion, the data that is actually being transmitted at that exact time). The "split screen bar", which is a solid line that separates the receive and transmit windows, also displays system status information and the time-of-day clock.

The size of the upper (receive) and lower (transmit and command) CRT screen windows can be changed by the system operator at any time, except when the system is in transmit mode. This feature allows the operator to tailor the size of the windows to meet changing conditions. For example, most of the CRT space could be allocated to receive while casually listening to signals on the band, or most of the CRT space could be allocated to transmit during periods of long transmissions, such as when sending pictures or MARS traffic runs. Each window automatically scrolls line information completely independent of the other. The receive window data can optionally be "packed" to use the entire 89-character CRT display line length when a maximum amount of received data is desired on the display.

System commands are brief, and indicative of the operation to be performed. As such, they are easily learned in a very short time. Provisions are made for automatic computer control of the station push-to-talk (PTT) line, and CW identification is automatic.

The system includes a time-of-day clock routine, complete with an alarm feature, to remind the operator of such things as approaching schedules and net times. The time-of-day clock is also used to provide an automatic disk log of all system start and stop times, and transmitter on and off times. In addition, operator entries may be keyed into the log, thus making it possible to do away with the manual log completely!

One very unique and interesting feature of the system is the dual-cursor scheme used to display the current status of the word correction buffer. Two cursors are used, one destructive block cursor which denotes the next position that will be occupied by the next character entered from the keyboard, and the flashing underline non-destructive cursor that lags behind the block cursor at a "word correction buffer length" number of characters. The "word correction buffer length" is specified by the operator, and can be changed at any time. This length is not only the distance at which the flashing underline cursor will lag the block cursor, but it is also the point to which backspacing will be allowed in case of a typing error. The automatic word wrap-around feature is also limited at this point. The word wrap-around feature will allow automatic wrap-around to the next line when the end of an input line is encountered. If the word being typed will not fit on the current line when the end of line is encountered, the system will automatically move the entire word to the beginning of the next line.

User acceptance of the system so far has been very enthusiastic. The software continues to be improved, and new releases are distributed to authorized customers for a minimal medium and handling charge. The latest release contains a picture copying and transmission mode that will allow the

transmission and reception of RTTY PIX with printer overlining (Previous software releases would not allow overlining on either transmitted or received data). Future releases will include additional features, identified and requested by system users, that will increase the utility and operating pleasure of the system.

As stated earlier, the original software was designed and developed primarily as a Navy Mars traffic handling system. The system is now available, completely redesigned and rewritten to include Amateur operation, from DFD Systems, 4805 N. 167th Street, Omaha, Ne. 68134. The system is delivered on a 5 1/4" diskette, and is priced at \$39.95. Each system is individually generated to include the Station call sign, so this information, along with the type of computer (H8 or H89) must be specified with the order.

Table 1 is a summary of the current system commands. Complete program documentation is provided with each system, as well as instructions for interfacing the computer system to radio station equipment.

The system has been a lot of fun to design and implement, and I am now thinking about converting it for use on other computers, specifically the new IBM microcomputer products. In the meantime, I hope the details of the evaluation and hardware selection tasks will benefit you in choosing equipment of this type in the future as you move into RTTY!

T A B L E ____ 1

Command	Function
B=nnn	Switches to ASCII and sets Baud Rate.
BVE	Closes down system and returns to HDOS.
CTRL-A	Shuts off alarm clock (tone on console speaker).
CTRL-B	Inserts a CW Identification into the message.
CTRL-C	Exits Pre-type or Transmit Modes. Use after RETURN.
CTRL-Z??	Emergency return to HDOS. NOT recommended for use.
CAT	List all disk files with the extension "TTY" or "PIX" on the system default disk drive.
C	Same as CAT.
CAT0	List all disk files with the extension "TTY" or "PIX" on SV0:.
C0	Same as CAT0.
CAT1	List all disk files with the extension "TTY" or "PIX" on SV1:.
C1	Same as CAT1.
CAT2	List all disk files with the extension "TTY" or "PIX" on SV2:.
C2	Same as CAT2.
CD	Closes receive disk file.
CH	Close hardcopy device.
CT	Cleares the Pre-Type Buffer for new data.
CWID	Turn on automatic CWID. NOCWID turns it off.
CW=nn	Enter CW Mode and set speed to nn words per minute.
D=filename	Opens disk file for writings received data.
D5	Sets Downshift upon receipt of a space (blank).
D1	Dismount the disk on SV1:.
D2	Dismount the disk on SV2:.
EVENP	Sets Even Parity for ASCII operation.
FB	Opens Blue buffer for loadins.
FR	Opens Red buffer for loadins.
FT	Opens Type Ahead Buffer for entry. CTRL-C Closes.
FW	Opens White Buffer for loadins.
Function Keys:	
f1=filename1.n2	Fills transmit buffer with (fname) disk file.
f2	Inserts date in transmit buffer.
f3	Inserts time of day in transmit buffer.
Blue Key	Inserts message loaded into Blue Buffer.
Red Key	Inserts message loaded into Red Buffer.
White Key	Inserts message loaded into White Buffer.
H=XX	Specify hardcopy device driver (LP: or AT:).
K=filename	Delete (Kill) the indicated disk file (fname).
L=nn	Sets line length. Use 73 for Baudot RTTY standard.
M=nnn@	Set CW output port to nnn@ (octal port no.).
M1	Mount a disk on SV1:.
M2	Mount a disk on SV2:.

N=PPP....	Write data (PPP...) to system log.
NOSVNC	Disables the automatic diddle.
NODS	Sets No Downshift from figures on receipt of a space.
NOP	Sets no parity checks for ASCII operation.
NOSTIK	Sets no STIK parity for ASCII operation.
OH	Open hardcopy printer device.
ODDP	Sets Odd Parity for ASCII operation.
PA	Prints currently set alarm clocks.
PACK	Packs received data into full 80 column lines.
PIX	Enters Picture mode. NOPIX exits Picture mode.
P=nnnQ	Sets the Port Address to specified octal value.
PT	Prints the type-ahead buffer contents.
RA=HH:MM	Resets or cancels the specified alarm.
RH	Turn on receive hardcopy print. NORH turns it off.
R1	Reset the disk on SV1:.
R2	Reset the disk on SV2:.
S=nn	Switches to Baudot operation and sets speed in WPM.
SA=HH:MM	Set alarm for time entered. Up to ten alarms.
SF=nn	Set screen receive/transmit split line.
STIK	Sets STIK parity for ASCII operation.
SVNC	Sets automatic synchronous idle. NOSVNC resets SVNC.
1SB	Sets 1 Stop Bit for ASCII operation.
2SB	Sets 2 Stop Bits for ASCII operation.
TH	Turn on transmit hardcopy. NOTH turns it off.
TX	Enters the transmit mode starting with data in the type ahead buffer first out.
T	Same as TX.
TXF	Enters the fast, break-in transmit mode preserving data in the type ahead buffer for later transmission.
TF	Same as TXF.
TX=fname,n1,n2	Enters transmit mode and sends the specified disk file. Useful for CQ's, contests, etc.
T=fname,n1,n2	Same as TX=fname,n1,n2.
U=n	Designates the default disk drive unit (0, 1, or 2).
UNPACK	Unpacks the received screen and displays as received.
W=nn	Sets the error correct buffer line length.
WRAP	Set operator input automatic CR/LF wrap on. NOWRAP turns it off.
X=fname	Switch output disk file to (fname).



A note from your outgoing Secretary. I've enjoyed working with you members of the club and find you are a great bunch. I find my new custom made desk set and stick pin, presented to me by President Jim Wilson, WBØJPN, handy in the former case and very attractive in the latter.

Ellen Morrissey
WBØHWF

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F. Hilton Norton, WB0HPP
Robert A. Conley, WB0LYU

40/00 Repeater

Jon. J. Penner, WB0GQT
Amy Hohensee, WB0UQI
David B. Hamilton, N0CLW
William A. Leatherwood,
WA0ZUR
Robert C. Lockwood, WA0DHU
F. Hilton Norton, WB0HPP
Robert A. Conley, WB0LYU

HAM HUM Postage

David B. Hamilton, N0CLW

NOVICE THEORY CLASS SCHEDULE

Jan. 7	Electron Theory & OHMS LAW
Jan. 14	DC Circuits with OHMS LAW
Jan. 21	Alternating Current
Jan. 28	Reactance & Inductance
Feb. 4	Review
Feb. 11	Vacuum Tubes
Feb. 18	Solid State Devices
Feb. 25	Transformers & Power Supplies
March 4	Amplifiers
March 11	Review
March 28	Oscillators
March 25	Receivers
April 1	Transmitters
April 8	Antenna's & Transmission Lines
April 15	Propagation & Review

Good Luck & Good Hamming

HAM HUM SWAP

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

- FOR SALE: Midland 13-510 2 meter transceiver.
Ron WAØMQM, 556-4914
- FOR SALE: Entire base station ranging from Yeaseu FT 101EE, Ten-Tek keyer, filter, 444 mike meter etc.—to tower, mini quad, rotor, dipole—\$1200.00 for everything.
Don Skomal WBØYGK, Bus. 571-6003 Res. 553-8664
- FOR SALE: Hallicrafters HT-46 XMTR and SX146 RCVR. 10 through 80 meters Excellent condition, original cartons and manuals. \$295.00 for both.
Dick MRSNY, Days 391-2312 Evenings 779-4737

ADVANCE AND EXTRA CLASS SCHEDULE

Date	Subject	Instructor
Jan. 4	DC Circuits	(
Jan. 11	AC Circuits	(
Jan. 18	AC Circuits	(
Jan. 25	Transistors	(
		Bob Lockwood WAØDHU
Feb. 1	Power Supplies	(
Feb. 8	AM-FM Transmitter	(
Feb. 15	SSB Techniques	(
Feb. 22	Digital Techniques	(
March 1	RTTY Techniques	Dick Jugel KØDG
March 8	Slow Skan Techniques	Jay McAleer WAØLLQ
March 15	Fast Skan Techniques	Frank Wolczak WAØIWF
March 22	Repeaters	Brian Zdan WAØAJI
March 29	Propagation	Frank Bruner KØSST
April 6	Antenna and Transmission Lines	Vern Wirka WBØQQM
April 13	REVIEW	Bob Lockwood WAØDHU
