

PACK RATS'



CHEESE

BITS



PACK RATS

CLUB CALL: W3CCX

MT. AIRY VHF RADIO CLUB, INC.

MT. AIRY V.H.F. RADIO CLUB, INC., PHILADELPHIA, PENNSYLVANIA (ARNS)

(50.2, 145.2, 221.4, 432.03 & 1296.3 Mhz) Repeater 222.98/224.58

AFFILIATED CLUB: AMERICAN RADIO RELAY LEAGUE

MEETINGS: Third Thursday of Each Month 8:00 P.M.

Southampton Free Library, 947 E. Street Road

Southampton, Pennsylvania

VOLUME XVIII

MAY 1976

NUMBER 5

The Prez Sez

The April meeting featured the second part of a talk by Walt, K3BPP, on integrated circuits. The meeting was rather sparsely attended because of the holidays, but the small group present seemed to enjoy themselves in the usual manner. Thanks to Walt for his fine presentation which we hope shed some light on the mysterious little critters with the short legs.

May is the month for our annual ARRL night. We set aside each year a meeting dedicated to publicizing and promoting our national organization. Invitations are sent to local clubs advising them of the subject of this rather special meeting. I wish I could tell you who or if we will have a speaker from Headquarters this year. However, as I write this, we have received no firm commitment or action on a request for such participation made last January. There will, however, be a program featuring local ARRL officials in the event that Headquarters chooses not to participate. Please check the coming events column on page 3 for the latest information. Also, at the May meeting the nominating committee will present its slate for the upcoming June election. Nominations will be open from the floor, however, please seek the consent of your potential candidate prior to nominating. This saves much time and some embarrassment.

June contest time is rapidly approaching and we need your help on the weekend of June 12 and 13. Hilltown, Pa. will once again be the sight of our portable operation. We will be operating on all bands from 50 MHz up thru 5.6 GHz. Bill, W3HQT, is the Chairman and needs a large effort from the membership to run this activity. Help will be needed on Friday to set up and again on late Sunday night and Monday to tear down, as well as for operation during the actual contest hours. Last year we finished in third place, very close behind the second place Club. A few more contacts or another section would have done it. Did you work W3CCX/3 last year? We need contacts from all members on all bands that you are capable of operating. This is the very least you can do!!

I hope everyone enjoyed the 20th Annual Banquet held on May 1st at the Buck Hotel. Thanks to John Tate, K3KTY, and his committee for once again doing a fine job. Twenty years is a long time and it is an especially long time to maintain the high level of enthusiasm, and excellence that has come to be the trademark of the Pack Rat organization. Keep on truckin!!

73, Ron, WA3AXV

* * * * *

NOTICE: There will be the unveiling of a Plaque for the late Paul R. Behrmann, K3WEU, at the Haym Salomon Memorial Park, Frazer, Pa. on May 9, 1976 at 1:00 P.M.

PACK RATS' CHEESE BITS IS A PUBLICATION OF THE MT. AIRY V.H.F. RADIO CLUB, INC. PHILADELPHIA, PA. AND IS PUBLISHED MONTHLY.

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WE OPERATE ON AN EXCHANGE BASIS WITH OTHER PUBLICATIONS AND ANYTHING THAT IS PRINTED IN CHEESE BITS MAY BE REPRINTED, UNLESS SO STATED, AS LONG AS THE PROPER CREDIT IS GIVEN.

SWAP SHOP ITEMS - NO CHARGE

DEADLINE FOR ARTICLES IS THE GENERAL MEMBERSHIP MEETING.

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215 RA 5-1928

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WA3TEM, MARSHA STEIN

MONDAY NIGHT NETS: NET CONTROL

145.2	-	7:30 P.M.	W2EIF
50.2	-	8:30 P.M.	W3CL
221.4/224.58		9:00 P.M.	K3GAS
432.03	-	9:30 P.M.	K3IUUV
1296.3	-	10:00 P.M.	W3HMU

FRIDAY NIGHT ATV NET: NET CONTROL

439.250	-	7:00 P.M.	WA3AXV
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PACK RAT REPEATER - WR3ACD-CHURCHVILLE, PA.
222.98/224.58

OFFICERS: 1975 - 1976

PRESIDENT: WA3AXV, RON WHITSEL
VICE. PRES.: K3MXM, LEE COHEN
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REC. SEC.: WA3DJF, CARL MATTIACE
TREASURER: K3GAS, DOC CUTLER

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K3ACR, RICH PATTISON
W3HMU, TONY SOUSA
W3HQT, BILL OLSON
WA3JUF, DAVE MASCARO

DIRECTORS' MEETINGS ARE HELD ON THE SECOND WEDNESDAY OF EACH MONTH AT DESIGNATED LOCATIONS.

TRUSTEE OF CLUB CALLS: W3CCX - WR3ACD:


W3SAO, FRANCIS BRICK
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215 DA 4-7524

AWARDS CHAIRMAN:

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609 - 783-9478

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Ed Clark

CALENDAR OF COMING EVENTS

Syllabus by Lee, K3MXM

MAY

- 1 The Pack Rat Banquet: Saturday Nite - The Buck Hotel, Feasterville, Pa.
A very good meal (your choice) Music, Dancing, Prizes, Surprises. Crowning
of our very own QUEEN OF MAY
John Tate, K3KTY, Chairman, extra tickets still available
Phone: 215-673-8840
- 2 Delaware Valley Radio Association, Flea Market and Auction, Pennington Fire House,
Route 31, Ewing Township (Trenton), N.J.
- 2 First Trenton Computer Festival, Armstrong Hall, Trenton State College, Route 31,
Ewing Township (Trenton) N.J. Flea Market, Tail Gating, Exhibits, Technical Talks,
information, Dr. Alan Katz, 609-771-2487
- 2 5th Annual Potomac Area VHF Society Hamfest, Westminster, Maryland.
- 9 Sunday, MOTHER'S DAY
- 12 Board of Directors Meeting, QTH, Walt Bohlman, K3BPP, 101 E. Street, Doylestown, Pa.
If lost, call 348-8913 for directions. Directors and interested parties cordially
invited to attend and participate.
- 15/16 Eastern VHF/UHF Conference, Howard Johnson Motor Lodge, Burlington, Mass. Seminars,
Displays, Noise Measurements, Meeting Groups, Info, Rich Commo, K1LOG, 3 Pryor Road,
Natick, Mass. 01760. Special Guest Dinner Speaker - Carl Scheidler, W2AZL.
- 15 Armed Forces Day
- 16 Warminster Radio Club Hamfest, Wm. Tennent High School, off Street Road, Warminster,
Pa. Support our neighbor club, a very nice Hamfest and right in our back yard --
tables, prizes, food and all facilities available.
- 17 Victoria Day, Canada
- 20 General Club Meeting 8:00 P.M. ARRL NITE, Wm. Tynan, W3KMV of QST "The World Above
50 MHZ" will be the guest. Meet the speaker at the Buck Hotel, Feasterville, Pa.
at 6:00 P.M. Southampton Free Library, Street Road, Southampton, Pa. mtg. place.
Doc's Silent Auction, The Mario Raffle, Refreshments.
Open meeting to one and all....
- 21-23 Rochester Hamfest, Rochester, N.Y. a big two day affair and one of the better ones
along the East Coast.
- 23 Pottstown VHF Club Hamfest, Rt. 422 Drive-In Movie, Limerick, Pa. about 9 miles
West of Norristown, Pa.
- 23 Rockville, Maryland Hamfest, Perry High School, Rockville, Maryland
- 31 Memorial Day

KEEPING POSTED ON FUTURE EVENTS

- June 12-13 June VHF QSO Party, Hilltown, Pa. Bill Olsen, W3HQT, Chairman
- June 26-26 ARRL Field Day
- July 18 Lehigh Valley Hamfest, W3LOX, info.
- July 23, 23, 25 ATLANTIC DIVISION CONVENTION, Benjamin Franklin Hotel, Phila., Pa.
- August 15 Delmarva Hamfest, Wilmington, Delaware
- AUG. 8-PACK RAT PICNIC - FORT WASHINGTON STATE PARK, FLOURTOWN, PA.-- AUG. 8th.
- October 3 HAMARAMA 76

NEW PRODUCTS OF INTEREST TO HAMS

By Lynn, W3NSI

1. SSB Transmitter/ Receiver Units 6 & 2 Meters: Icom is now importing two very interesting SSB T/R units for VHF use. A sample of both the IC 202 for 2 meters and IC 502 for 6 meters were borrowed from Trevoise (Hamtronics) Electronics for study and evaluation. Results on both sets were very good. A wattmeter test showed 2 1/2 watts out on 2 meters and 3 watts out on 6 meters. Both units operate on internal "C" cells (9 pcs) and so life when transmitting at the 20% rate should be at least several hours. In operation, with a portable TV set 3 feet away, no TVI was noted on any channel. Both radios include Microphone, earphone, 2 spare phone plugs, and a DC plug for external power. Units can be used either SSB or CW, and a key jack is on the front panel. It was noted that AM can be copied at zero beat if the signal is strong enough. Coax fitting at the back of both sets are used for external antennas, in which case the whips are pushed down into the cases. The 6 meter unit uses a free running oscillator covering the first Mhz of the band. Transmitter and receiver are locked together. The 2 meter unit (IC 202) uses a VXO to tune the first 400 Khz of the 144 band in two segments. Two other channels are available for any other 200 Khz sections of the band. (first 2 Mhz) The units are well done and it was noted that the 200 Khz on 2 meters required 3 dial revolutions while the 6 meter 1 Mhz section needed 12 dial revolutions to cover. The dial lamps, which would be needed when operating without other lights at night, can be switched on and off. The units used Texas Instrument ICs, while the rest of the parts appear to be Japanese. Radios are very stable, in fact during one QSO that lasted over an hour, no drift was noted from a "cold" start. If the station contacted drifts, there is an RIT control to adjust the receiver only on both ICOM rigs. The only thing wrong will no doubt be taken care of before this is in print -- the instruction books are in Japanese! Price \$250 and \$260 for 6 M and 2 M. Suite 307, 3331 Towlewood Drive, Dallas, Texas 75234 or visit Pres at Trevoise.

NOTE: Our Secretary Harry Brown, WA3NGK reminds us: when renewing your membership to the ARRL help build the Club treasury. Let Doc, K3GAS, send in the payment and the Club gets \$1.00.

Add to your membership directory: Home phone No. for Dick Subin, K2EVW, 609-641-3987.

In memorium: James Spry, W3KXH died April 7, 1976. Our heartfelt sympathy to his family.

AN INVITATION TO FIELD DAY OPERATION

By Ric, WA3UDS

Any members of the Pack Rats interested in participating in a QRP Field Day Operation at the Churchville Elementary School are asked to contact WA3UDS, 355-1980. We plan phone and CW operation on 10-80 Meters and at least FM on 50, 144, and 220 Mhz. Maximum output power will be 5 watts. Under the class FD rules, the power source must be either batteries or natural power. We need interested operators, equipment and especially batteries. The dates are June 26-27.

OFFICIAL BULLETIN NR 583 FROM ARRL HEADQUARTERS NEWINGTON CT APRIL 1 1976 TO ALL RADIO AMATEURS
BT: If you have a lively curiosity and a real interest in doing something satisfying with your amateur radio, you'll find the ARRL National Traffic System a fascinating way to go. The day-time portion of NTS functions primarily on phone and is in particular need of stations to perform liaison functions on 40, 20 and 75 meters. A listing of both daytime and evening NTS region managers appears in the April QST Public Service Column. Both evening and daytime NTS would welcome your participation. Check with your SCM or ARRL Headquarters for further details. AR
OFFICIAL BULLETIN NR 584 FROM ARRL HEADQUARTERS NEWINGTON CT APRIL 8 1976 TO ALL RADIO AMATEURS
BT: Because of a normal seasonal reduction in solar panel illumination it has become necessary to reduce the operating schedule of the AMSAT-OSCAR 6 satellite. The transponder will be on for two-way communications on all south to north, ascending node passes on GMT Mondays, Thursdays and Saturdays as well as for all north to south, descending node passes on GMT Sundays. A sheet describing Oscar 6 and 7 schedules for Field Day weekend, June 26-27, 1976 is now available upon request from ARRL Headquarters. AR

VHF/UHF REPORT

By Jo, W2EIF

There is little to report with respect to six and two meters except for the two aurora openings which occurred in late March and early April. The first of the auroras started near Midnite of Thursday March 25 and lasted till the early morning hours of Friday. The second opening occurred Wednesday evening March 31 with signal noted sporadically from 7 PM on. The at 11:30 p.m. things began to pop. The opening lasted till 6 AM according to WA1FFQ. K2RTH reported working all the zero states on 2 meters except Colorado. He and others worked WØEMS in Nebraska. The aurora extended to the deep South as Georgia and Alabama were worked. WA2CJK/4 in Portsmouth, Va. (near Norfolk) also worked WØEMS for a new state.

Needless to say although I was on Wednesday evening on 2 meters until 10 P.M., I did not hear any aurora and went to bed missing the whole show. I also missed the one on March 25.

Jack, W2AXU says that a recurrence of the March 25 event is predicted for April 22 on so for you who would like to try aurora keep a sharp ear to the 6 and 2 meter bands from April 22 to 30.

Thursday nites has produced 1296 contacts between myself, K1PXE, W2OMS and WA3JUF. The Monday nite 1296 Pack Rat net now has four people signing in at 10 P.M.!

Band openings on six should start about the second week in May. Good Luck!!

VHF SPACE NET CONTEST

SALUTING

USA...APOLLO II... APOLLO/SOYUS

JULY 3/4, 10/11, 17/18, 24/25, 1976

OPERATING TIME..6 P.M. SATURDAY TO 9 P.M. SUNDAY, EACH WEEKEND

RULES

1. Each contact counts as TWO POINTS. The same station can be reworked on different VHF/UHF bands and modes for additional TWO POINTS.
 2. All worked stations CAN BE REWORKED again during the balance of the month's weekends for additional TWO POINTS. (Same as Rule 1.)
 3. EACH DIFFERENT ZIP CODE counts as 1 MULTIPLIER.
 4. Any contacts out of the USA will use post office town or city in lieu of a Zip Code. These will count as a MULTIPLIER.
 5. REPEATER CONTACTS ARE NOT VALID, EXCEPT FOR SATELITE OR MOON BOUNCE.
 6. SCORING..ADD ALL TWO POINT CONTACTS, and MULTIPLY by the TOTAL of DIFFERENT ZIP CODES and POST OFFICE LOCATIONS.
 7. TROPHY PLAQUES will be awarded for 1st, and 2nd place in EACH POWER.
CLASS I, 100 to 1000 WATT input CLASS III, 5 to 25 WATT input
CLASS II, 25 to 100 WATT input CLASS IV, 1 to 5 WATT input.
- In addition TROPHY PLAQUES will be awarded for CLUB PARTICIPATION. Club Entries will indicate the total combined score of its member stations. These will be submitted by a Club Official.
8. LOGS.. MAILING DEADLINE, AUGUST 21, 1976. Enclose SASE for complete results.
 9. Space Net CERTIFICATE will be awarded to high schorer in each section. To be eligible, a minimum of THREE STATIONS must submit scores from each Section.
 10. BICENTENNIAL AMATEUR CALLS ARE ALSO VALID FOR USE IN SCORING

.....

VHF SPACE NET

TRIPLE ANNIVERSARY ROUND/UP

K4AWS

VHF SPACE CENTER

P.O. 15

Sumterville, FL 33585

* * * * *

Congratulations to our typist, Marsha, WA3TEM, on her recent engagement to Fred Lissauer of Clark Summit, Pa. Wedding bells on June 27, 1976.

7/31 - 8/1 ROANOKE DIVISION CONVENTION &
HAMFEST, NORFOLK, VIRGINIA

ARRL Roanoke Division Director, Phil Wicker, W3ACY, and the ARRL Board of Directors has approved TRCI's application to hold the 1976 Roanoke Division Convention in conjunction with its Hamfest. The event is now known as the "1976 ARRL ROANOKE DIVISION CONVENTION AND HAMFEST". The two day event will use the facilities of SCOPE's entire exhibition hall, Holiday Inn SCOPE and Norfolk's new waterfront Omni-Internation Hotel. This will provide a total indoor and air conditioned 200 car tailgate flea market area, 16,000 sq. ft. of formal exhibitors' area and numerous large meeting rooms for the various forums and convention agenda items. 800 hotel rooms are being held for advance registration at Holiday Inn SCOPE and the Omni which may be reserved through the Holidex system by calling 800-238-5400 toll free. Be sure to mention the event when making your reservations to obtain the special convention reduced rates. Further details will appear in the various Ham magazines starting in May. Tickets are \$2.50 in advance (available now and \$4.50 at the door). For further details contact TRCI at P.O. Box 9371, Norfolk, Va. 23505.

- - -
K3MXM TID BITS

South Jersey Radio Association will celebrate its 60th Year party this coming June. Plans are under way to use a special call for a 10 day period with WS2JRA. This will be used during the period of the June QSO Party. Be on the lookout...

In reading many of the other club newspapers a common problem exists all over the country. Rip-offs. It doesn't seem to matter whether the set is a CB or Ham, it is a radio set that can be stolen and sold. All sorts of suggestions and ideas are forthcoming. Number one, the insurance companies are being very tight about paying out losses even with special riders. One suggestion made was to get your equipment covered under MARINE insurance. Other thoughts; replace your call tag license plates the next time around. Also, the antenna is the sure pointing finger so many have suggested using magnetic mounts which can be taken inside when parking. Also ANTENNA SPECIALISTS have an antenna which looks very similar to the Broadcast antenna. Write them for info and costs. Ed Tilton has an article in November 1975 QST about mobile and portable antenna, and some of these ideas may be adopted.

Those of you that spend the summer or weekends in Stone Harbor, N.J. will be interested to know that there is now a new radio club and repeater in the area. The club is called SHARK (Stone Harbor Amateur Radio Klub) and the repeater frequencies are 146.61/.01. For further information contact Harry G. Frey, K3MDG, 201 Buttonwood Way, Glenside, Pa. 19038.

FROM LERC: Licensed low-power transmitters are being phased out of the 11 meter Citizens Radio Service band. Manufacturers have until 18 March 1977 to discontinue manufacture of the 27 Mhz equipment on 26.96 - 27.23 and will be illegal after March 1983. A new band has been established for unlicensed low power AM or NBFM transmitters; four 20 Khz channels are established on 48.83, 49.87 and 49.89 Mhz. Isn't it nice the FCC has established this market for old 6 meter equipment. We can look forward to having the same type of visitor on 6 meters as we have on 10 meters...

Radio Magazine popularity was surveyed at SAROC and the following percentages are what was indicated for magazine readership. QST - 84%, HAM RADIO 57%, 73 - 37%, CQ - 34%, World Radio - 34%.

New types of fishing lures are introduced each year and the fisherman continue to bite...

SWAP SHOP CONTINUED FROM PAGE 8

National receiver 15 to 300 Kc, \$20; Heath wireless intercom 2 each #GD-51, \$15; Lafayette stereo amplifier #LA-240, \$20; Rek-O-Kut Turntable Rondine stereo w/pickering arm and cartridge \$25.

CONTACT: Ed Kushner, W3HKZ, Phone 215-825-0775

JUNE 12-13 VHF QSO PARTY


W3HQT, Bill Olsen, chairman of the June VHF QSO Party activities announces the following:

Band captains have been selected... 6 Mtrs. WA3AXV; 2 Mtrs. W3HQT; 220 Mhz. WA3JUF; 432 Mhz. WA3NGK; 1296/2300 and above - K3BPP. W3HMU will be in charge of the 432 Mhz. EME station.

MT. AIRY V.H.F. RADIO CLUB, INC.



ADS

<p>NE 7-8329</p> <p>GEORGE S. VAN DYKE, JR., P.E. CONSULTING ENGINEER</p> <p>W3HK</p> <p>4607 CONVENT LANE PHILA., PA. 19114</p>	 <p>AMERICAN RADIO RELAY LEAGUE HARRY A. McCONAGHY, W3SW/W3EPC DIRECTOR, ATLANTIC DIVISION</p> <p>8708 FENWAY DRIVE - POTOMAC BETHESDA, MARYLAND, 20034</p>
<p>609-429-0087</p> <p>BRADDOCK ASSOCIATES MANUFACTURERS' REPRESENTATIVE</p> <p>EDWARD BRADDOCK MEMBER: I.E.E.E. W2BAY</p> <p>POST OFFICE BOX 305 HADDONFIELD, N. J. 08033</p>	<p>1215-127-8052</p> <p>W3CL</p> <p>HARRY B. STEIN ASSOCIATES COMMUNICATIONS CONSULTANTS</p> <p>HARRY B. STEIN</p> <p>2067 PARKDALE AVE. GLENSIDE, PA. 19038</p>
<p>(609) 424-4258</p> <p>GREENTREE PRESS Business cards - Envelopes QSL cards - Tickets - etc -</p> <p>1980 GREENTREE ROAD CHERRY HILL, N. J. 08003</p>	<p>A request from your AD Manager</p> <p>PATRONIZE OUR ADVERTISERS Tell them you saw their ad in CHEESEBITS. Leave your QSL card with them. CHEESEBITS is one of the best read local radio club papers. Circulation - 300</p> <p>73 magazine for radio amateurs</p> <p>1 year - \$10 2 years - \$17 3 years - \$20</p> <p>PETERBOROUGH, NEW HAMPSHIRE 03458</p>

SWAP SHOP

FOR SALE: Collins 62S-1 6 and 2 meter transverter-
Like new. Make offer.

CONTACT: Jack Power, W2AXU, 102 Upper Ferry Rd.
Trenton, N.J. 08628. Phone: 609-882-8811

FOR SALE: Swan 260 (latest) Cygnet with EV mike.
Hustler antenna - 20-40-75 whips - 3 finals \$275.

CONTACT: Chaires Hackenyos, W3CQA
Phone: 215-PI 5-5909 After June 9th.

FOR SALE: Full size metal office desks. Assorted
sweep signal generators. Model 19 teletype.

CONTACT: Dave Zimmerman, W3ZD, 520 Centennial Rd.
Warminster, Pa. 18974. Phone: 215-675-4539

FOR SALE: Tempo CL 220, original carton, manual,
xtals on simplex (223.5) Pack-Rat & Trevoise Repeaters.
Like New. \$175.00

CONTACT: Russell Bainbridge, Jr. WA3OAE
6 Vestry Ln., Levittown, Pa. 19054
Phone: 215-943-3644

FOR SALE: Seneca 6 & 2 xmtr - 120 watts. Good
condition. \$55.00

CONTACT: Thomas Marino, W3GQX, 2104 Robbins Ave.
Phila., Pa. 19149. Call anytime after
8:30 a.m. Phone: 215-PI 4-0491

FOR SALE: D104 Mike with G stand-push-to-talk
lockbar. Plus waters speech compressor model 359
(compreamp) Ready to operate \$25.00

CONTACT: Herman Klein, K3GOZ, 2600 Welsh Rd. Apt. 39
Phila., Pa. 19152, Phone: 215-HO 4-6555

WANTED: 8 Mhz xtal for Pack-Rat net
freq. 145.2 Mhz. 3 or 4 element light-
weight triband beam-light duty antenna
rotor for same.

CONTACT: Dick Subin, K2EWW, 711 Shore
Rd. Northfield, N.J. 08225. Phone:
609-646-7388 (office) 609-641-3987 (Home)

FOR SALE: Military microwave mixer
xtal test set #390, \$10; Kay Electric
DC-500Mhz attenuator 6 steps to 35 Db-
50 ohms BNC's \$15; Heath LP-1 Linearity
pattern Gen modified color bars, video
& RF out \$15; Video Distribution Amp HB
rack mount, w/sync mix and 4 outputs \$15
Spectrum analyzer HB 455 KC, \$20; 2 meter
cavity Dielectric prod adj. .5 to 3 db
\$35; Heath 3" scope modified to 3.5 Mhz
and attenuators \$35; Heath ACVM #AV2 \$10
Motorola calibrator #S1315A \$300; Knight
RF Z Bridge, \$5; Heath calibrator VC2
\$5; Heath Antenna impedance meter \$10;
Data Engineering new 4 tone encoder \$15;
Data Engineering new decoder \$15; Bruno
RF Microwave power bridge \$10; RCA 10
watt PA audio amplifier \$15; Nems-Clarke
multi-coupler for receivers #PM-406A @
230 Mhz \$20; Navy receiver 220 to 410 Mh
110 AC input \$25; CONTINUED ON PAGE 6



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RTTY ANTHOLOGY (PART 2)

By Ralph Alexander, WA3FOF

- Early Teleprinters and Codes -

In 1849, the same year as the great gold rush to California, a crude teleprinter was developed and used on a line between Philadelphia and New York. The system was fraught with problems which were mostly of a mechanical nature. This was because each machine was made one at a time by craftsmen who had many problems in building these machines. The main problem was the lack of standardization, something that is now done world wide. Something as simple as breaking a screw in a casting was somewhat of a major disaster, because in most cases the casting would have to be re-melted and re-cast or thrown away. Almost everything was produced in this very slow and backward manner. About the only industry that had moved ahead in its production methods was the makers of instruments of destruction. The gun and ammunition industries were the only ones who moved ahead in their production methods. Why? There was such a demand for guns and ammunition that there was no way that the makers could keep up with the demand until they discovered how to mass produce these items in high quantities. Thru the Civil War and up until about 1900, this is how things were made.

When Henry Ford "discovered" mass production and made the first mass produced cars, his cars came off the assembly line for about \$550. He undercut his competition that were making cars with a price figure of about 10 to 12,000 dollars. (Remember, this was before something called inflation.)

As we know Morse's original code was made up of clicks for dot, dashes, and in some letters spaces. This is the same code used on American land line telegraph operated by railroads. Later International Morse was developed with only dots and dashes that is used today on amateur and commercial radio.

For a machine a new code had to be developed using a new system. For example, a human can understand the difference between two "E"s sent together and the letter "I", but a machine would have a lot of problems making the distinction. So this new code was developed on the basis that all the letters would have the same length and the system had to work on the same parameters as the existing telegraph system: two conductors, 120VDC. — — — — — 0.060 A, or 60 ma. This code took the form of a complex, compressed binary, made up of five informational segments or levels with each level having two possible conditions, on or off, which in RTTY language translates to Mark or Space.

This allowed for a maximum of 32 possible characters. With the English language having only 26 letters this was a distinct advantage; as opposed to say the Chinese alphabet which has over 600 characters. So from a technological standpoint, our short alphabet was a great advantage.

By making the machine with an upper case and a lower case, it was possible to make the machine with double the total amount of characters and functions. The system was set up in the following manner. The lower case would consist of the 26 letters of the alphabet in capitals and some machine functions. The upper case was needed for numerals, punctuations, and machine functions like the signal bell. Functions common to both cases are carriage return, line feed, figures shift, letters shift, space bar, and blank key. Most people do not understand why there is a blank key on the keyboard. It is used in some machines to lock out the keyboard of all machines during transmissions. But to make it work, the blank key must be pushed twice in succession.

With the passage of time another new code has been developed called ASCII, the American Standard Code for Information Interchange. This is pronounced ASKI2. This code is straight binary code with 7 levels with an 8th level for a parity bit.

There are two main reasons for this new 8 level code. The old International Code #2 (known as Baudot or the standard 5 level RTTY code) was too restrictive in that it only had room for a maximum of 64 possible combinations, but in fact the number was slightly less than that. ASCII permits 256 possible combinations. Also, the older 5 level machines could only run a maximum speed of 60-100 WPM and these newer computers could operate much faster.

ASCII is used mostly by computers. Today computers operate so fast that the output printing is stored on magnetic tape or other temporary memory (buffers). The printer takes from memory as fast as it can print using printing speeds of 100 WPM or even 1000 WPM by printing an entire line with one strike on a device called a line printer.

Shown here is a copy of the following codes: Original Morse, International Morse, International Code #2 and ASCII. (See next Page.)

INTERNATIONAL
MORSE

BAUD DOT
FIVE LEVEL

1 2 3 4 5

ASCII
EIGHT LEVEL

8 7 6 5 4 3 2 1

LAND LINE
MORSE CODE

A	•—	A	-						
B	—•••	B	?						
C	—•—•	C	:						
D	—•—•	D	\$						
E	•—	E	3						
F	•—•—	F	!						
G	—•—•	G	&						
H	••••	H	STOP						
I	••	I	8						
J	•—•—	J	'						
K	—•—•	K	(
L	•—••	L)						
M	—•—	M	.						
N	—•—	N	,						
O	—•—	O	9						
P	•—•—	P	Ø						
Q	—•—•	Q	1						
R	•—•—	R	4						
S	••••	S	BELL						
T	—•—	T	5						
U	••—•	U	7						
V	•••—	V	;						
W	•—•—	W	2						
X	—•—•	X	/						
Y	—•—•	Y	6						
Z	—•—•	Z	"						
1	•—•—	CAR RET							
2	•—•—	L. F.							
3	•••—	FIGS.							
4	•••—	LETS.							
5	•••—	SPACE							
6	•••—	BLANK							
7	•—•—								
8	•—•—								
9	•—•—								
Ø	•—•—								
.	•—•—								
,	•—•—								
?	•—•—								
/	•—•—								
—	•—•—								

@																			NULL
! A a																			SOR
" B b																			STX
# C c																			ETX
\$ D d																			EOT
% E e																			ENQ
& F f																			ACK
' G g																			BELL
(H h																			BS
) I i																			HT
* J j																			LF
+ K k																			VT
, L l																			FF
- M m																			CR
. N n																			SO
/ O o																			SI
0 P p																			ILE
1 Q q																			DC1
2 R r																			DC2
3 S s																			DC3
4 T t																			DC4
5 U u																			NAK
6 V v																			SYN
7 W w																			ETB
8 X x																			CAN
9 Y y																			EM
: Z z																			SUB
; [\]																			ESC
< ^ _																			FS
= ~																			GS
> ^ ~																			RS
? -																			US

A	•—
B	—•••
C	••—•
D	—•—•
E	•—
F	•—•—
G	—•—•
H	••••
I	••
J	•—•—
K	—•—•
L	•—••
M	—•—
N	—•—
O	•—•—
P	•—•—
Q	—•—•
R	•—•—
S	••••
T	—•—
U	••—•
V	•••—
W	•—•—
X	—•—•
Y	—•—•
Z	—•—•
1	•—•—
2	•—•—
3	•••—
4	•••—
5	•••—
6	•••—
7	•—•—
8	•—•—
9	•—•—
Ø	•—•—
.	•—•—
,	•—•—
?	•—•—
/	•—•—

BLACKED OUT SQUARES INDICATE A MARK CONDITION OR CURRENT PULSE
OPEN SQUARES INDICATE A SPACE CONDITION OR A NO CURRENT PULSE

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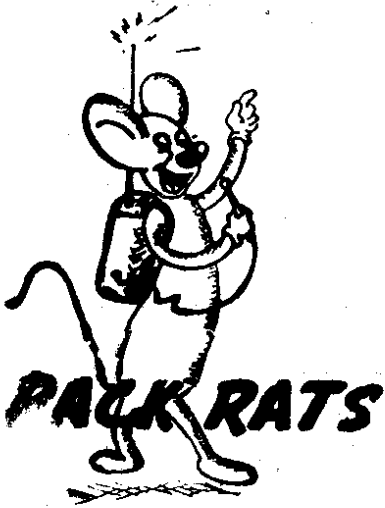
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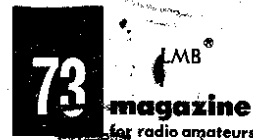
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