

# PACK RATS'



**PACK RATS**

CLUB CALL: W3CCX

MT. AIRY VHF RADIO CLUB, INC.

# CHEESE BITS



MT. AIRY VHF RADIO CLUB, INC., PHILADELPHIA, PA.  
50.2, 145.2, 221.4, 432.03, 1296.03, Repeater - WR3ACD -222.98/224.58

ARNS

AFFILIATED CLUB: AMERICAN RADIO RELAY LEAGUE

MEETINGS: Third Thursday of each month at 8:00 P.M.  
Southampton Free Library, 947 E. Street Rd.  
Southampton, Pennsylvania, 18966

VOLUME XIX

APRIL 1977

NUMBER 4

## THE PRESIDENT'S PLATFORM

Spring has come. It is in the air. It has been marked on the calendar. It is a good time to get started on those outside projects; antennas, towers, ground rods; to repair the hard Winter damage. Tower raising parties are easy to arrange; just spread the word.

The Hamfest/Flea Market season has started. There are quite a few in the local area within several hours driving time. A golden opportunity to clean up the cellar and shack and to acquire some goodies.

Good news.. we will again have HAMARAMA on the first Sunday in October at our old stand, The Bucks County Drive-in Theater. An added new feature this year is the Mid-Atlantic States VHF Conference to be held at the Treadway Motor Lodge in Willow Grove, Pa. the day before, on Saturday that is.. a couple miles down the road from the theater site.

Bill Olsen, W3HQT, the June VHF QSO Party Chairman has already gotten planning under way. Let Bill know of your availability to operate, to log, to set-up, or to be generally available. Come out for a fun week-end at Hilltown and help us win again this year.

The program at the coming regular club meeting should be especially interesting. We are having a representative from a local transistor manufacturing company explain and demonstrate how they are made, how they work, the problems and the possible solution to your problems. Should be especially good, so invite your friends to come on along. See you there.

73, Lee, K3MXM

\*\*\*\*\*

## VISITORS AT THE MARCH 17TH MEETING

WA3PSB, Ron Simpson, Morrisville, Pa.

W3AYJ, Al Schnipper, Phila., Pa.

W3ILN, Fred Housler, Hatboro, Pa.

K3VFP, George Szymanski, Phila., Pa.

WB2JMA, Frank Bicking, Camden, N.J.

WA3VGT, Joe Frezza, Horsham, Pa.

K3CHN, Seymour Rosen, Phila., Pa.

\*\*\*\*\*

Are you home or mobile on week-days around 10 A.M. -- why not join the fun with the senior Pack-Rats on the 220 Mhz WR3ACD Repeater ... 222.98/224.58 Mhz.

Pack Rats CHEESE BITS is a publication of THE MT. AIRY VHF RADIO CLUB, INC. Philadelphia, Pa. and is published monthly.

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SWAP SHOP ITEMS - no charge.

DEADLINE FOR ARTICLES IS THE GENERAL MEMBERSHIP MEETING.

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TYPIST:

WA3TEM, Marsha Lissauer

\*\*\*\*\*

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Philadelphia, Pa. 19141  
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OFFICERS: 1976 - 1977

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K3IGX, Richard Boyle (2 years)  
K3JJZ, Elliott Weisman (2 years)  
W3HQT, William Olsen (1 year)  
W3YXF, Joseph Rushton (1 year)

\*\*\*\*\*

MONDAY NIGHT NETS:

145.2 MHZ 7:30 PM  
50.2 MHZ 8:30 PM  
221.4/224.58 MHZ 9:00 PM  
432.03 MHZ 9:30 PM  
1296.3 MHZ 10:00 PM

NET CONTROL

W2EIF  
W3CL  
K3GAS  
K3IUU  
W2EIF

FRIDAY NIGHT ATV NET:

439.25 MHZ 7:00 PM

NET CONTROL

WA3AXV

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\*\*\*\*\*

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CALENDAR OF COMING EVENTS  
Syllabus by Lee, K3MXM

APRIL

- 1 April Fools' Day - be extra wary and don't say we didn't warn you!
- 3 Palm Sunday  
Passover
- 3 Calvert Hall Hamfest, Towson, Md. Info. Bro. G. Malseed, W3WVC, 8102 LaSalle Rd.  
Towson, Md. 21204. Talk-in .. 146.07/.67 - 147.63/.03
- 8 Good Friday
- 9 Civil War ended- 1865
- 10 Easter Sunday
- 14 Board of Directors meet at the QTH of John Tate, K3KTY, 520 Larkspur St., Phila., Pa.  
If lost phone 673-8840. Directors be there- interested parties invited.
- 21 Regular meeting - Southampton Free Library, Street Rd., Southampton, Pa. at 8 P.M.  
Illustrated talk and demo on transistors and IC's - design and manufacture.  
Speaker: Mr. James Benjamin, Solid State Scientific Co., Montgomeryville, Pa.  
The Mario Raffle - Frankies Silent Auction - Refreshments. Meeting open to all.
- 29 to May 1 - Dayton Hamvention - Dayton Hara Arena and Exhibition Center.
- 30 PACK-RAT BANQUET AND LADIES NITE - Buck Hotel, Feasterville, Pa. 7 P.M.  
Live danceable music - Awards - Prizes - Surprises - Fine food - \$12.50 per person.  
John Tate, K3KTY - Chairman.

OTHER DATES WORTH REMEMBERING AND LOGGING

MAY

- 1 Delaware Valley Radio Association Flea Market and Auction - Villa Victoria Academy,  
Rte 29, West Trenton, N.J. Talk-in 146.07/.67 and 146.52 Mhz.
- 7 Potomac Area Hamfest, Frying Pan Park, Herndon, Va.
- 7,8 Third Annual Eastern VHF/UHF Conference, University of New Hampshire, Durham, N.H.
- 13,15 West Coast VHF Conference, Santa Barbara, Cal. Contact K6YNB for details.
- 15 Warminster ARC HAM-MART Flea market and Auction, Wm. Tennent HS, Warminster, Pa.
- 19 ARRL NITE with the Pack-Rats at the regular meeting - Southampton Free Library.
- 20 Rochester New York Hamfest
- 30 Memorial Day - "Movin ON '77" - Giant CB Fair - Pocono International Raceway.

JUNE

- 3,5 '77 ARRL NATIONAL CONVENTION - Info. Scarborough ARC, VE3WE, PO Box 1011 - Station "C",  
Scarborough, Ontario, M1H 2Z4
- 11,12 ARRL VHF QSO PARTY - Club will be at Hilltown, Pa. Bill Olsen, W3HQT - Chairman.

## NEW PRODUCTS OF INTEREST TO HAMS

by Lyn, W3NSI

1. TWO METER H/T: Hygain is selling their new FM H/T # 3806. The unit covers 6 channels with 146.52 Mhz supplied. The power section is separately sealed and the speaker grill is designed to keep out rain. Unlike most H/T units, the controls are on the side rather than on top. This allows a bit more spread so you are able to get your fingers on the knob. A built-in antenna collapses into the case, however, it is possible to use a "rubber ducky". Jacks are provided for external power, antenna, and earphone. Price \$189. Hygain Electronics, 8601 NE Hwy Six, Lincoln, NE 68505.

2. FREQUENCY DEVIATION METER: CHM Products Inc. has a very interesting FM Deviation Meter on the market. At \$85, it is a much better value than another unit selling for \$145 at the present. (ECM Corp.). Three ranges of deviation are provided:- 10,20, and 100 Khz. which should cover anyones needs. Battery is included in the price and provision is made for battery resting. Unit is crystal controlled, so if it is used on 2 meters one could expect to use a common frequency such as 146.52 Mhz normally supplied with most rigs. For the 220 Mhz band that frequency would probably be 223.5 Mhz. P.O. Box 6193, San Bernardino, Cal. 92412.

3. KLM 2700 2 METER T/R: This new rig covers 144-148 Mhz using both VFO and built-in synthesizer. Frequency read-out is on a 5 digit LED (synthesizer only). Transmitter is rated at 10 watts out from one end of the band to the other. The 2700 covers AM, FM, CW and upper and lower SSB. Power supply is built in as is a 100 Khz calibrator. Unit is built with OSCAR operation in mind; in fact an OSCAR receiver is built in along with provisions (space and terminals) for for 50 Mhz and 432 Mhz converters. Size 5 x 15 x 12 in. deep. Price - \$799.

\* \* \* \*

## VHF/UHF REPORT

by Jo, W2EIF

The activity on 50 Mhz is extremely low. W3HMU reports that WA9DOT (Wisc) is on most mornings and can be worked using CW. Sunday mornings seems to be the best time with respect to activity. 144/145 Mhz still shows more activity than 50 Mhz and contacts can be had most any nite on SSB with more activity being noted around 145.2 Mhz. There is still some AM activity with stations being copied at 145.3 Mhz and 145.4 Mhz. The Monday nite 2 meter Pack-Rat AM Net at 145.2 Mhz which starts at 7:30 PM still draws 25 to 30 participants.

Tuesday evenings at 8 PM a group meets at 144.2 Mhz (SSB) before going to 1296 Mhz for contacts. Successful 1296 contacts have been made over 100-150 mile paths along the East coast.

Wednesday nite is still 432 nite, and quite a few stations can be contacted during the evening using AM, CW, and SSB. A surprising number of stations are using SSB, good antennas and higher power. It has gotten to the point that one must have VFO, VXO or Transceive because most operators expect replies on their frequency.

Information received from the SWOT group in Texas indicates that there have been a number of good openings on 2 meters in the Southern part of the country. No openings have been observed in this area and no Aurora conditions worthy of note.

\* \* \* \*

## NET NEWS NOW

Word from Pack-Rat Tony, K4AWS in Sumterville, Fla. that he has reactivated the famous SPACE NET on Friday evening, March 4th at 8 PM on 50.2 Mhz. He reports over 100 check-ins with interest shown on the new ARRL 6 Meter "600 Club" Award. They say they will check in on Fridays. The local Sentinal Star newspaper has been interviewing Tony resulting in good publicity for Ham Radio. The Space Net 8th Anniversary Contest (Apollo II) is scheduled for July 16,17-197 from 6 PM to 9 PM local time. Details in later issue of Cheese-Bits.

The Warminster ARC Net has also been reactivated on Wednesday evenings at 8 PM on 50.5 Mhz (except the 1st Wednesday of each month). Harold, WA3ICO is net control from station WA3DFU.

# Spring Has Sprung

Pack Rats

Ladies Night

April 30, 1977



Tickets:  
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John Tate  
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THE SCM's PAGE  
by Geo. Van Dyke, W3HK

The following was taken from the minutes of a meeting of the JAMAICA AMATEUR RADIO ASSOC.

" The meeting was adjourned at 9.10 p.m., and turned over to WAIUAT/6y5, a member of ITU, a U.N., activity with Pierre participating in the training function run by the ITU for developing countries. Pierre's lecture on the ITU organization and the upcoming WARC '79 conference was a real eye opener and he left no doubt that we all have much much work to do if we are to retain our Amateur Bands, or extend them in 1979.

Pierre pointed out clearly the many problems facing the delegates to WARC '79, particularly, those from countries supporting amateur activities in holding a strong line with the many countries which don't want amateur radio at all! There are several of these.

Again, it was pointed out that it is the responsibility of every holder of an Amateur License to rigidly adhere to all the operating rules laid down in the regulations and avoid at all times, any action or activity associated with amateur radio which can in any way be criticized. 6Y5LA thanked Pierre for his very fine lecture."  
- - -

Editors note: It is interesting to point out that at the March 12th meeting of the Delaware Valley Chapter, QCWA, ARRL President Harry Dannals, W2HD presented a very excellent speech elaborating on the above theme.

\* \* \* \*

PACK-RAT VHF CONTEST LAMENT  
(Delayed Crying Towel)- by Geo. W3HK

WHY IS IT THAT:

1. Everybody has to use the same frequency at the same time.
2. After working a DX station, the guy calls CQ right on top of him.
3. Everybody knows where the new station is and they all call at once.
4. Everybody has to cram into the lower 5 Khz of each band.
5. Phone stations have to work on top of CW stations.
6. Somestations call CQ, then move off the frequency before they listen.
7. Some stations use splatter modulation.
8. Everybody works somebody at least twice during the contest.
9. The guys with the calls with letters that all sound alike; talk the fastest.
10. The ball point runs out of ink in the middle of a contact.
11. The log sheets keep falling on the floor.
12. You are deaf after the contest.
13. You remember the guy who steps on a new section, but forget the one that helps you get a new one.
14. DX always shows up 180° away from where your beam is pointed.
15. You hear that the band was open when you were away from the operating position.  
on & on & on .... ..

OFFICIAL BULLETIN NR 634 FROM ARRL HEADQUARTERS NEWINGTON CT MARCH 3 1977 TO ALL RADIO AMATEURS BT

Senator Barry Goldwater, K7UGA, on March 2 introduced a bill, S-864, requiring that measures to prevent radio frequency interference be incorporated in the manufacture of consumer electronics products. The bill is similiar to the bill Goldwater introduced last year. See page 39 of March 1976 QST for a discussion of last years' bill. Amateurs who support such RFI legislation should send a personal letter to their Senators in Washington, DC, outlining the need for protective filtering and shielding in consumer electronic equipment. Similiar legislation is expected to be introduced in the House of Representatives shortly. AR

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CONTACT: Bob Welsh, W3CZM

2632 Brownsville Rd.  
Langhorne, Pa. 19047  
Phone: 215-757-7764

FOR SALE: Heath HX10 Xmtr. SSB, CW, FSK & AM; VOX also - \$90. Penwood 24hr. clock, \$3. Sola 450VA Multitap constant vltg. xformr, 115V Input - 32 VAC Max. Sec. Use-14V, 22 Amp. DC Sply. - \$15. Superior 1KVA Pwrstat, 40 VAC Input, 0-40 VAC out at 25 Amps. - \$15.

CONTACT: Jim Beaver, W3AHZ  
1015 Edge Hill Rd, Roslyn, Pa. 19001  
Phone: 215-886-8180

FOR SALE: Clegg 22'er AM Xcvr and HA5 VFO Hallicrafters 80 thru 2. Both for \$75.

nece 2 & 6 Xmtr. \$40. Manuals for all.  
CONTACT: John Wolf, W3IMU  
965 Buck Rd., Holland, Pa. 18966  
Phone: 215- 968-4122

FOR SALE: Swan 250C, w/117XC - \$315., Clegg Mark II 22'er AM - \$95., Regency Monitoradio Model MR-33D, 30-50 Mhz FM - \$65. Heath Pwr Converter MP-10, 6/12 VDC to 117 VAC - \$20. Vanguard 407 144-146 Mhz converter w/Vanguard in-line pre-amp - \$65. Collins R-390A Rcvr (#97) - \$495. Keyer KY-7/FRT (converts Audio to Xmtr keying - \$45.

CONTACT: Rich Subin, K2EVW, 711 Shore Rd.  
Northfield, N.J. 08225

Phone: 609-646-7400 or 609-646-7388

FOR SALE: From the estate of W3SAO. National 183D Rcvr with converters for 2,6, & 220. 100 Watt AM professionally homebrewed Xmtrs for 2,6, & 220 with stable VFO's. microphones, Pwr Splys, in 6 ft. cabinet rack. Schematic diagrams. Beam Ant. for all 3 bands, cables, rotator and tower. Complete station a bargain at \$195.

CONTACT: Doc Cutler, K3GAS, 7815 New Second St.  
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FOR SALE: IV camera with Vidicon w/ control unit and remote focus & turret control. Need work - \$20. R-11 Rcvr, 190-550 Khz. ARC-5 Type - \$5. Many articles on conversion of this unit.

CONTACT: Doc Cutler, K3GAS - 215- ME5-1078



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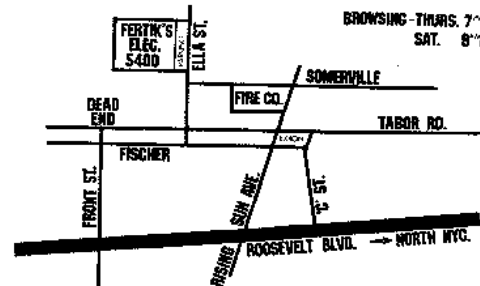


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—Guru Maharaj Ji

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SWAP SHOP ( Continued from page 7 )

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CONTACT: Ron Whitsel, WA3AXV  
209 Frog Hollow Rd.  
Churchville, Pa. 18966  
Phone: 215-355-5730 after 6 PM.

FOR SALE: NC 270 Rcvr, 80-6 Mtrs.  
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CONTACT: Henry Doberstein -  
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Phone: 215-DE3-7494 week days  
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WANTED: Manual for AIL Model 74 Noise Figure Meter including 70 Mhz IF Amplifier and diode noise source.

CONTACT: Harry Brown, W311T  
3012 Potshop Rd. Norristown, Pa. 19403  
Phone: 215-584-4846

FOR SALE: NC 300 Rcvr 160-10 Mtrs. with matching 6 and 2 Mtr. converters in a cabinet. Cables incld. Heath Seneca Xmtr. Ameco TX.62 Xmtr. Manuals for all. Mint condition. Loads of electronic parts and vacuum tubes. All for \$ 350.

CONTACT: Chas. Jacobs, K3PMU, 8720 Ditman St.  
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FOR SALE: TV Camera, RCA TK201 with control unit, Wollensak 25Mm lens, and remote focus. ExCond. \$125

Teletype Model 15 Page Printer - \$75.  
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Teletype Model 14 Tape Reader - \$15

(Package deal.. above teletype gear with Power Supply - \$125) Regulated Pwr Sply, Philco 300 Volt: 1 Amp. - \$12. TV Sync Generator, Rck Mtd., Raytheon- \$15. Instructograph code machine with set of 10 tapes - \$25.

CONTACT: Bert Soltoff, K31UV, 961 Warfield Lane,  
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\* \* \*

TID BITS

We have heard from a number of Pack-Rats and their friends not seen for a long time as follows WA3DJF, Carl Mattiace, K3ZCY, Ed Barbacow, George Korn, K3GFF, Frank Hormann, K3ATL, Bill Pierce, John Hannes, K3IUZ, and Seymour Rosen, K3CHN.

If you are around the shack any morning from 9 A.M. on, don't forget to check-in with the "COFFEE-POT NET". Norb, WA3RXO is net control par excellence.

Income Tax Tip - All members of MARS (Air Force, Army, Navy) can deduct related expenses.

The February 1st count of Amateur Licenses attests to the success of widespread training activities sponsored by the ARRL, clubs and others throughout the country. A new high of 293,655 amateur operators has been reached and 38,365 of these hold Novice licenses.

Answer to Lee's quickie quiz which appears on another page in the paper.....  
Yellow House; W4, Trio, Halo, Fish...Blue House; W9, Yaseu, J-Beam, Dog  
Red House; W2, Homebrew, Quad, Cat...Ivory House; W8, Heathkit, Multibeam, Tortoise  
Green House; W3, KW, Dipole, Parrot.....

Anyone interested in a booklet on the Metric System can send away for it free of charge. Write to:- Metric A.S.M.E., 345 East 47th St., New York, N.Y.

Congratulations are in order to Ron Whitsel, WA3AXV for the FB presentation at the March 17th meeting on the design of low voltage power supplies.

LEE's Quickie Quiz and other jottings

So many of you enjoyed the last quickie quiz, so here is another one. Lets see how you do.

1. There are five Hams living in a row of houses.
2. The W2 lives in a red house.
3. The W8 keeps a tortoise.
4. A KW rig is used in the green house.
5. The W9 runs a Yaesu rig.
6. Facing the row, the green house is immediately to the right of the ivory one.
7. The Ham with a Quad has a cat.
8. The Halo is on the Yellow house.
9. A home brew rig is in the first house.
10. The W4 lives in the first house.
11. The Ham with the J-beam lives next door to the chap who keeps tropical fish.
12. The halo is on the house next to the house with the dog.
13. The Ham with the Heathkit uses a mutiband vertical.
14. The W3 uses a dipole.
15. The W4 lives next door to the blue house.

Questions:- Who owns the Trio Rig? Who keeps a parrot?

Do you think you are confused,... .. consider poor Columbus- he did'nt know where he was going; when he got there, he did'nt know where he was, and when he got back home; he did'nt know where he had been. IFFR Pilots

Dead batteries no longer have to be thrown away. General Electric has introduced a low cost recharge battery system with a mini charger that plugs into a wall socket and recharges batteries in 14 hours. G.E.'s own nickel-cadmium batteries can be renewed 1,000 times or more. Charger BC-3 sells for \$5.98

The Long Wave Club has a monthly bulletin for LF (540 Khz and down) enthusiasts appropriately named "LOWDOWN". It is offered free for 12 legal sized SASE sent to H. John Clements, 9010 Tobias #258, Panorama City, Cal. 91402. de SARA SLIP

\* \* \* \*

JUNE 11, 12 VHF QSO PARTY PLANS

Bill Olsen, W3HQT, the June VHF QSO Party Chairman has made selections of band team captains for this annual event at Hilltown, Pa.

6 Meters - WA3AXV      2 Meters - W3CXU/K2EVW      220 Mhz. - WA3JUF/W2EIF  
432 Mhz. - W3HMO/K3IUV      1296/2304 Mhz. - K3BPP      2 Meter FM - WA3NFV/WA3ZRE

The set-up of equipment and antenna systems starts on Friday June 10th so keep that date free and come on out and give the gang a helping hand.

\* \* \* \*

2 Meter FMers continue to become a more and more serious problem for OSCAR. Satellite users are urged to listen for simplex operations between 145.80 and 146.0 and drop those they hear a note and ask them to move down the band. de HR report....

Our now famous Moonbounce Expedition group made another fine presentation on March 15th to the Mid-Atlantic VHF Radio Club at the G.E. Space Center located in Valley Forge, Pa.

RTTY ANTHOLOGY (PART 10)  
by Ralph Alexander, WA3FOF  
THE MODEL 15 KEYBOARD

The primary purpose of the keyboard is to take mechanical motion in the form of the downward movement of the key tops and convert this into the corresponding character of Baudot Code. To understand how this is done it is best to look at the underneath side of the machine. Observe the bottom of the keyboard. There are a series of key levers running from the front of the machine to the back where they all pivot from a single shaft at the rear of the machine. A short distance forward there is a small notch cut into the bottom of each of the key levers. Resting in this notch is one end of a hairpin spring. The other end of the spring is secured in a hole on a bar that runs across the bottom of the unit. This fixed bar has holes for all of the springs. It should be noted that some of the springs are a little heavier than others. The heavier springs are connected to function keys since it was determined that these keys require more tension than a standard character key.

Just ahead of the notches there is the first of a series of three combs which act to keep the key levers in vertical alignment. Ahead of the first comb is the universal bar. The bar moves each time a key lever is pressed and its movement is transmitted to the top side of the machine. More about this later. There is another comb and just ahead of it are five code bars which look like saw blades with irregular teeth. Each tooth on one side has a 90° cut; a 45° cut on the other side. When a key lever comes down against the 90° side, nothing happens. However, when a key lever comes down on the 45° side the code bar is moved. This movement is also transmitted to the top side of the keyboard by an extension on the code bar. Just ahead of the five code bars is the final comb or the front comb which is on the outside of the bottom enclosure of the keyboard.

On the top side of the keyboard the fiber driven gear on the keyboard main shaft overhangs the rear of the keyboard. This fiber gear mates with a portion of the main shaft of the typing unit. This is the way mechanical power is supplied to the keyboard. Forward of the fiber gear there is a support for the main shaft of the keyboard with an oil cup and just ahead of this is the clutch. The clutch is released for one revolution each time a key lever or SPACE is pressed. The clutch is released by the universal bar linkage arising from the bottom of the machine. The only time it will be held open for repetition is for the character SPACE that has additional linkage to hold the clutch in release. This is automatic spacing by holding the SPACE bar down.

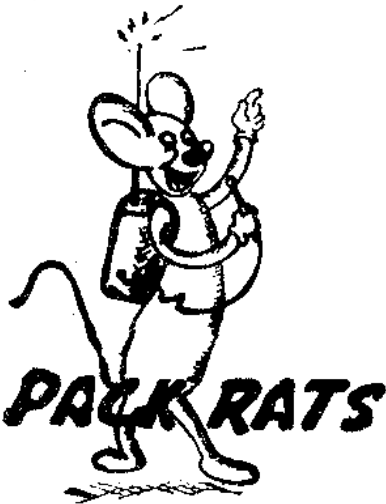
The five code bars have extensions coming up from the bottom to the top of the machine at the right of the main shaft. These extensions have small protrusions on their tops. After a character has been started by a key, the locking wedge arm is lowered by a cam follower next to the clutch; coming down and locking the five code bar extensions into either MARK or SPACE positions. Looking from the front of the machine it should be noted if the protrusion is on the left of the locking wedge, that segment will be a SPACE. If the protrusion is on the right hand side of the locking wedge, it will be a MARK. On the left hand side of each code bar extension there is a small metal arm which is connected to the other side of the transmitting system where it is shaped like a "question mark". This "question mark" covers the transmitting contacts. The six sets of transmitting relay contacts contain carbon contact points. The rear set of contacts are normally closed. Normally the loop current passes through these contacts except when there is a transmission of a character. When a key top is pressed causing the transmission of a character a sequence follows:

First the universal bar is activated; then the key lever goes a little further down. The code bars move into place and their extensions are locked into place by the cam follower on the locking wedge on top of the machine. The main shaft then starts to rotate and the first set of contacts is opened. Nothing else happens for the SPACE START pulse period of 22 milliseconds. The six cams on the keyboard main shaft rotate and depending on how the five remaining code bar extensions are set; the "question mark" extensions forces each set of contacts either into a closed position or permits them to remain open in 22 millisecond sequences. At the end of the rotation, the first set of contacts is again closed for the start of the 31 millisecond stop segment. This sequence has produced an electrical series Baudot Code that came from a mechanical parallel Baudot Code for a character. The clutch system is now disengaged and the machine is ready for the next character. More about this keyboard and the Model 19 keyboard in the next installment.

\* \* \* \*

What have you done for your hobby lately. If the answer is "not much" or "nothing", then try to find a way to demonstrate Amateur Radio to a CBER or SWL.

Cheese Bits  
 2087 Parkdale Ave.  
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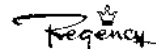
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