

PACK RATS'



PACK RATS

CLUB CALL: W3CCX

MT. AIRY VHF RADIO CLUB, INC.

CHEESE BITS



MT. AIRY VHF RADIO CLUB, INC., PHILADELPHIA, PA.

ARNS

50.125, 144.150, 220.125, 432.110, 1296.110 MHz, W3CCX - Repeater 222.98/224.58 MHz

Affiliated Club: AMERICAN RADIO RELAY LEAGUE

Meetings: Third Thursday of each month at 8:00 P.M.

Southampton Free Library, 947 E. Street Road
Southampton, Pennsylvania 19866

VOLUME XXV

JUNE, 1983

NUMBER 6

THE PREZ SEZ

Congratulations are in order to all of the Pack-Rats; we have made it our 23rd consecutive January Contest win. Special thanks to all of our members and friends who made this achievement possible. Well, WA3AXV, the "King" rules again. Great job Ron!

Our congratulations to all of the other clubs in the club categories, and also to the many individual stations who made the contest one of the best ever.

Those of us who attended the annual Ladies Nite and Awards Banquet really were treated to an enjoyable evening. Doc, K3GAS put on another great show. All of the ladies seemed to enjoy themselves - lots of fun and laughs. The awards were super this year. Everybody was excited about receiving an award. Congratulations to Lee, K3MXM for being selected the "Pack-Rat of the year" - just our way of saying thank you Lee.

The regular meeting for May was quite interesting. Carol Smith, AJ2I from ARRL headquarters gave an outstanding and interesting talk on towers and matters pertaining to tower restrictions. Great job Carol. We enjoyed having you visit and share information on a topic which is very close to all of us. W3ABC, Hugh Turnbull, Atlantic Division Director, also gave an interesting talk on the subject of RFI, no-code licensing, and volunteer examinations. Thanks Hugh for visiting and sharing this valuable information.

Well, the Spring Sprints are over. Looks like they were a bang-up success. I am sure we will take a close look at the results. Maybe the shorter contest will be considered the rule rather than the exception! Don't know about those grid locators though; didn't know where anybody was. Great show, however. Let's try it again.

73, Bill, WA2DPU

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is given.

SWAP SHOP ITEMS - NO CHARGE

DEADLINE FOR ARTICLES IS THE GENERAL
MEMBERSHIP MEETING: THE THIRD THURSDAY
OF THE MONTH

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609-783-9478

CLUB HISTORIAN:

W3CL, HARRY B. STEIN

MONDAY NIGHT NETS NET CONTROL

7:30 PM - 50.125 MHZ	W3CL
8:00 PM - 144.150 MHZ	W2EIF
8:30 PM - 222.98/224.58	K3GAS
9:00 PM - 432.1 MHZ	K3IUV-WA2DPU
9:30 PM - 1296.025 MHZ	W3CXU

PACK RAT REPEATER 222.98/224.58 MHZ

LOCATED IN CHURCHVILLE, PA.

OFFICERS: 1982-1983

PRESIDENT: K3KTY, JOHN TATE
VICE-PRES: WA2DPU, BILL SMITH
COR. SECY: W3ZD, DAVE ZIMMERMAN
REC. SECY: W3NSI, LYN ROWLAND
TREASURER: K3GAS, DOC CUTLER
DIRECTORS: W3IIT, HARRY BROWN
WB2RVX, MIKE GALLO (2 yrs)
WB2VLA, DAVE POWER (2 yrs)
WA3JUF, DAVE MASCARO (1 yr)
WA3NUF, PHIL MIGUELEZ (1 yr)

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CALENDAR OF COMING EVENTS.
Syllabus by Lee, K3MXM

JUNE

- 2 Teleconference Radio Net via Nation Wide Repeat Chain. Mr. Joe Reisert, W1JR will talk and discuss "Antennas and Antenna Systems; Where is the State of the Art Going?". You can listen in, read the mail and talk with Joe via your local repeater. Here in the Philadelphia Area it will be on 147.66/.06. This is the second of these Teleconferences following a very successful number One with Vic Clarke.
- 4 Ridley Park School District ARC Hamfest - Ridley Jr. High School, Ridley Park, Pa.
- 5 Manassas Virginia Hamfest
- 5 Tri-County ARC Hamfest, Stirling, N.J.
- 6 "D" Day - 1944
- 8 Good Material for a Trivia Quiz - Vacuum Cleaner Patented 1869
- 9 Board of Directors Meeting - QTH, Harry B. Stein, W3CL, 2087 Parkdale Avenue, Glenside, Pa. 19038. Directors and concerned members always welcome to participate.
- 11 Minicomputer Show and Fleamarket - Meadowlands Hilton Hotel, Exit 16W, New Jersey Turnpike, N.J.
- 11-12 June VHF QSO Party - Although the club is not participating as W3CCX this year, your own on the air time and contacts are welcome and needed by the many other stations in this contest. A few hours time can help you find those needed sections and states.
- 12 Jersey Shore Hamfest - Deal, N.J.
- 14 Flag Day - Fly your flag with pride and honor.
- 16 General Club Meeting - Southampton Free Library, Subject: Election of Officers. An open meeting to all - bring your friends. The Mario Raffle, Frankie's Silent Auction, Free Refreshments.
- 17-18-19 Summer Smirk Party Contest
- 18 W2QW Hamfest - Columbia Park, Dunellen, N.J.
- 19 Father's Day - Don't forget to leave those catalogues open to the right page....
- 18-19 If you are traveling through the South at this time - visit the Atlanta Hamfest - one of the bigger ones in the Southeast...
- 19 Wilkes-Barre Hamfest - New spot, Kingston Armory, Kingston, Pa.
- 21 First Day of Summer
- 25-26 ARRL Field Day - the biggie of all contests, all bands, visit some of the sites of the area Ham Clubs. An exciting and interesting time can be had..
- Overheard at the Ladies Nite Banquet: "Nope - I don't eat Natural Foods - at my age, I need all the preservatives I can get!"

NEW PRODUCTS OF INTEREST TO HAMS

By Lyn, W3NSI

1. HT for 220 MHz: Santec now has available a 220 rig with the same features as the 440 and 144 units. The ST 220 UP is about the size of the Icom IC3A but has a number of extra advantages over the Icom unit. First, the tone pad controls the frequency, which can then be read on a six digit LCD. This same readout is also a 24 hour clock, even when the HT is off. Three power levels are available, 2.5-1-.1 watt output, switch selected. It is possible to set up 10 frequencies in the memory and scan these frequencies or scan a section of the band. The tone pad is also used for autopatch operation. The extra features certainly seem to be worth the extra \$90 cost over the Icom HT. Price \$329 - Encomm Inc., 2000 Ave. G-Suite 800, Plano, Texas 75074
2. POWER CHECK METERS: The Welz Co. is producing an extensive line of VHF and UHF antenna switching and test equipment. The TP 05X can be plugged into the antenna connector on an HT and will read the output in watts up to a maximum of 5 watts. Frequency range is 50-500 MHz. A bigger brother the TP 25A features an extra dummy load in series with the meter to read up to 25 watts over the same frequency range. Price \$21 (\$40 for the TP25A) Same QSH as #1.
3. T/R FOR 1296: Icom is starting to advertise a new rig for 1296 MHz. This is an FM radio covering 1260-1300 MHz and has most of the features of the IC-25 and IC45 mobile rigs for 144 and 440 MHz. A four digit readout is used to indicate frequency and tuning rates of 10/20 KHz and 1 MHz are available. Six memories are used to store most active channels, and repeater offsets are programmable. It is possible to scan just the memories or the entire 40 MHz. This is the first complete 1296 rig for ham use. Price _____, 3331 Towerwood Drive, Suite 307, Dallas, Texas 75234.

* * *

UHF/VHF REPORT

By Joe, W2EIF

Activity on all bands remains low. The Spring sprints on 220 and 432 produced about the same results here. Same number of contacts 50 and 10 or 11 grid squares on each band. 220 was surprizing in that VE3CRU was worked for the first VE3 that I have worked on that band other than on aurora.

432 was fair and contacts could be made to NC and Boston quite easily but not too much elsewhere.

The 1296 contest was slow as could be expected with conditions up and down quite rapidly. Only 10 contacts on that band!!

The six meter contest for Sat. nite 6 to 12 sounds like trouble! As a suggestion maybe it would be better to hold it Sat. afternoon 1 to 7 PM, and maybe some of that daytime Es would show up. Good hunting.

EDITORS NOTE: The 50 MHz sprint on the 21st was fairly active with an opening most of the evening to Florida and South. Activity to the Northeast of the Phila. area seemed sparse -- prime time on TV programing is down this time of the year and with DST many viewers are busy with outdoor activities ----so perhaps Sat. evening sprint isn't so bad.

W2EIF had a power failure due to storm activity so got started late - worked 57 in 24 grids, W3CL operated less than three hours worked 52 in 20 grids. KS2T reported 68 in 25 grids. N3BHS - QRP worked 19 in 12 grids including C6ADV in the Carribbean. N3BBI reported working over 100 in 30 some odd grids - his second contact was VP2MO also a number in grid EN. An opening from one land to the West Coast was reported. K3KTY in FN10 was heard batting away. WA2DPU was hunting for DX!

W2EIF reported an aurora opening up to 432 during the afternoon of May 22nd. Another aurora during the early evening encom passing 6 & 12 on May 23rd.

VISITORS - MAY 19, 1983 MEETING

AJ2I - Carol Smith, Hartford, CT.
3ABC - Hugh Turnbull, College Park, MD.
AA2Z - Mark Wilson, East Hampton, CT.
KA3CHV - Michael Roth, Doylestown, Pa.
K3IFH - Ed Guscini, Phila., Pa.
K3GM - Leon Lapkiewicz, Phila., Pa.
K3KDF & Judy - Bud Smyth, Phila., Pa.

Ex-K3PBA - Whitey Metzger, Huntingdon Valley, Pa.
W3CZM - Bob Welsh - Langhorne, Pa.
KA2NYF - Janet, Deptford, N.J.
WB2ONA - Warren, E. Brunswick, N.J.
N3ADI - Mike, (Roxboro) Phila., Pa.
WB3JHX - Mike McLaughlin, Phila., Pa.
W2NM - Mel Sulzburg, Gloucester Co., N.J.

* * *

NOMINATIONS

The Nominating Committee presents the following slate:

President - WA2DPU, Bill Smith
Vice-President - WB2VLA, Dave Power
Cor. Secretary - W0RSJ, Bill Murphy
Rec. Secretary - W3NSI, Lyn Rowland
Board of Directors: WA3AAJ, Jim Ward
WA2OMY, Gary Hitchner
WA3YUE, Bruce Loss
Treas. - K3GAS, Doc Cutler

Nominations remain open and may be made from the floor before the election at the June 16, 1983 regular meeting.

* * *

UHF CONTEST ANNOUNCEMENT

August 6 and 7 is the date for the 1983 ARRL UHF Contest. This will be the Club "Field Day" effort for this year. The Club has decided to go out for this more specialized contest mainly because it better reflects the Club's main interest: Concentration on the higher frequency bands. The Contest runs from 3:00 P.M. Saturday until 3:00 Sunday which allows for daylight breakdown. W3CCX will operate all bands from 220 MHz to 10 GHz. Tentative band captains are as follows:

Open	-	220
Open	-	432
WA3AXV	-	1296
WA3JUF	-	2304
W3HQT	-	3456, 5760
WA3NUF	-	10250

A number of new sites are being considered and the final determination will be made by the second week in June. We are trying to find a better "Microwave" site, but will fall back on Hilltown if nothing better comes up. Please mark the date on your calendar and plan to help in whatever way you can. The first organizational meeting is scheduled for early June and will be announced on the nets. See you in August.

73, Bill, W3HQT

SWAP SHOP

FOR SALE: Comaire 6 mtr. tuner, Maverick 6 mtr. filter; Chuscraft 6 mtr vertical (new); 6 & 2 Finco beam w/rotor (to be taken down); CDR Ham M rotor & control box; Kenwood SP230 speaker; Quement SWB2 pwr-swr meter; R50 low pass filter; B&W low pass filter; Skytec spkr; Heath mobile speaker; Marathon 1/4HP electric motor; Poloroid Land camera - make offer, all in good cond. Smith Corona electric portable typewriter \$125.

CONTACT: W3GVR, Sparks Zuger Mayer
90 H. Hilltop Drive
Churchville, Pa. 18966

FOR SALE: Homebrew 4 - 811A-linear amp. w/self contained pwr sply - 80 thru 10 mtrs - Grid & plate meters; Jack for relay control; 125V D.C. internal sply for change-over relay; ant. change-over relay from Heath SB200 - \$100; Heathkit SB300 rcvr \$150.

CONTACT: W3CZM, Bob Welsh
Phone: 215-757-7764

FOR SALE: Drake 2-C rcvr & 2 - CS spkr console - mint condx w/manual \$190. Tymeter 24 hr. digital clock \$6. Drake R-4B, T-4XB, AC-4, MS-4 w/all manuals, cables, filters, NB, extra tubes, cover-craft dust covers, all mint condx. \$625. Recently serviced by R.L. Drake, must sell soon.

CONTACT: W3SRO, Bob Wilderman
19 Glen Road
Lansdale, Pa. 19446
Phone: 215-822-7474

FOR SALE: Wilson 2202 SM H/T 220 MHz lw 10--2w hi; 6 chan. installed inc. 223.5 223.42 simplex, 224.58, 224.74, 224.72, 224.62 Rpt chanl. Unit complete w/rubber duck ant. Spkr/Mic unit--leather case--nicads drop-in charger - book. Good condx. \$145. Leece-Neville 75 amp.alternator. #4400AA-new unit, never installed. Could be used to replace low power car unit or coupled to gas engine for portable power supply. \$15.

CONTACT: Lyn, W3NSI
Phone: Phila: 742-7695
N.J. 201-255-5998

FOR SALE: KLM 14 element 2 mtr. beam with KLM balun \$25. KLM 8 ele. 6 mtr. beam (18ft) w/KLM balun \$35. KDK 2 mtr. FM w/Ces TT mike, 3 memories - 10 watts \$150.

CONTACT: Don, WB3CDE
Phone: 215-847-5065

FOR SALE: Collins 32S-3 W/PS (we); Collins 51J3 (R388) (0.5 to 30.5 Mhz) RCA AR-8516 (80 Khz to 30 Mhz) Heath HO-13 ham scan; 250Hz filter for TS830S (455 Khz)

CONTACT: Gus, K3GYS
Phone: 609-767-3628

FOR SALE: 6 mtr. Halo & bumper mount - make offer; Miller coils & coil forms; stereo reel to reel tape decks; reel to reel tapes.

CONTACT: Doc, K3GAS
Phone: 215-635-1078

FOR SALE: Heath 2 mtr. MDL 2036, P/S HWA 2036-3, Micoder II VGC - \$150. Heath 6 mtr MDL-HX30 trans/exciter, CW, AM, SSB (5watts) plus 2 mtr transverter (QST) EC \$115.

CONTACT: K3HSS, Charlie
Phone: 215-342-4398

* * *

COMMERCIAL AD

June 3-4

Friday 6:00 P.M. - 9:00 P.M.
Saturday 8:00 A.M. - 4:00 P.M.
Relocation sale at "KB3M'S". I can't take it all with me. 6 meter AM & FM radios. Low band receivers, tubes, test equipment (tube type) 6 meter and 450 MC antennas. Parts, chassis, cabinets, panel fronts, connectors, audio and power transformers, relays, small rack cabinets, arm chair desks, steel desk with command module top, office furniture and equipment. Joe Frezza, 1725 County Line Road, Warrington, Pa. 18976. Corner of County Line Road and Rte. 611.

* * *

* * *

APPLICATION FOR MEMBERSHIP

AA2Z, Mark J. Wilson
229 Marlborough Road
East Hampton, CT. 06424
203-666-1541

TID BITS

Sunwatcher, Jack Power, W2AXU, reports the monthly Sunspot No. for April 1983 = 79.7.
moothed No. for October 1982 = 95.2.

Congratulations to Dona & Greg Adams (KD6KD) on the recent addition to their family - baby girl Lindley.

We learned recently that W3HKZ, Ed Kushner, associated with Channel 10 of Phila., received an Emmy Award for technical direction of the Phila. Eagles Play-Off game of January 1981 at the Vets Stadium. Good show Ed!!

A number of Pack-Rats attended an FB meeting of the Delaware Valley Radio Association on May 11, 1983 in Ewing, N.J. Dr. Yardley Beers, WØJF of Boulder, Colorado presented a slide show - "Fifty Years of DX". He also demonstrated homebrew 2300 MHz gear; a very enjoyable evening.

WB2ONA, Warren of E. Brunswick, N.J. attended the May 21st meeting and gave a summary of the events at the N.E. VHF Conference held the week-end of May 14, 1983. Our banquet/Ladies Nite was held on the evening of May 14th also so Pack-Rats were unable to attend from this area - conflicting dates always present a problem.

Mike, N3ADI gave a pep talk on Pa. Tower Bill #49 and stressed we all send letters to our local Pa. House Reps. His talk at the ARRL Nite dove-tailed with the info. presented by Carol Smith of the ARRL.

Al, K3EOD reports that health problems with himself and family have kept him from attending meetings. He hopes that things will clear up in the near future.

Thanks to Bruce, WA3YUE for his procurement of the Pack-Rat coffee mugs.

Congratulations to Dave and Barbara Mascaro (WA3JUF) on their recent marriage.

* * *

KEEPING SCORE WITH YOUR PERSONAL COMPUTER

By WA3HIT - Paul J. Rilling

The purpose of the following program is to help you keep score (your score) for the January Contest. It uses (of course) your personal computer.

It will print out (1) the number of contacts you make per band, (2) points per band (shown in ()), (3) total sections plus 10, (4) total number of contacts, (5) total number of points and of course the (6) score.

Keep in mind that this program was developed on the Sinclair ZX 81. You may want to make minor modifications for your own machine. How the program works. Let us say that you worked all bands from 6 to 2300, and you made the following:

6 150 contacts	432	25 contacts
2 115 contacts	1215	8 contacts
220 75 contacts	2300	2 contacts

First you choose the band you wish to correct or update or enter new information. Then enter the number of contacts made on that band so far. Then, enter the number of total sections worked from all bands. Carefully read the REM instructions on line 2310 through 2360. repeat this procedure for all the bands you have worked.

Fig. 1 shows you what the scoreboard will look like when all the above information is entered. Let us say that you have worked 5 sections.

(CONTINUED ON PAGE 8)

KEEPING SCORE WITH YOUR PERSONAL COMPUTER
CONTINUED

WA3HIT JAN. VHF SS SCOREBOARD

SELECT DESIRED BAND:

BAND CONTACTS SECTIONS SCORE

6	150	(300)
2	115	(230)
220	75	(300)
432	25	(100)
1215	8	(64)
2300	2	(32)

TOTAL 375 (1026)5 + 10 = 15 15390

The first column of numbers is the contacts made. The numbers in () are the points. Your computer will multiply the points by the sections you worked plus 10. This gives you the score.

If you only work some bands, the scoreboard will print out only those bands.

Well, good luck and 73

WA3HIT

NOTE: If anyone wants the program print-out, please get in touch.

* * *

ARRL NITE REPORT

Our ARRL Nite was a gala affair with a large turnout enjoying presentations by Carol Smith, AJ2I (Happenings Editor - QST) & Hugh Turnbull, W3ABC, Atlantic Division Director. Carol Smith spoke about the burgeoning tower ordinances springing up all over the U.S. & gave timely suggestions in combating these problems. W3ABC brought us up to date on League problems, no code licensing for one, and RFI information. He also presented our 23rd Jan. VHF SS Gavel to Phil, WA3NUF our Contest Chairman. Mark Wilson, AA2Z (ARRL Contests) presented Jan. VHF SS Certificates to the Pack-Rat winners. The hi-scorer plaque was presented to Ron, WA3AXV making him "King" again.

* * *

BANQUET NITE
REPORT

The best turnout in recent years helped to make our banquet/ladies nite an fb affair. Presentations of coffee mugs (with a neat Pack-Rat imprint) to January VHF SS participants was a surprise to many and well received. Non participants may buy a mug for \$2.50 - Jan. VHF SS high scorers as well as "Homebrew" winners received plaques. K3MXX, Lee Cohen was overwhelmed when he was presented the "Pack-Rat of The Year" award. All of these events were expertly handled by our MC & Prez WA2DPU, Bill Smith. John Tate, K3KTY, who served a shortened term as President, made the invocation.

We were surprised to see Syl Einhorn, W3ISV and his XYL Dot after so many years. Helen (Mother Rat) XYL of departed W3SAO joined the head-table group as well as Muriel Boyle, XYL of K3IGX, who was a visitor from Arizona----Dick remained back home! It was nice to see the Gene Bonds (Jr. & Sr.) who never fail to join our affairs. Many thanks to Doc, K3GAS who again did a fine job as Chairman of the affair.

* * *

NOTE: Band opened again on evening of May 24th!! 6 mtrs that is...

THE OSCILLATOR DESCRIBED HAS BEEN USED BY MANY PACKRATS AND FRIENDS IN THE DESIGN OF LOCAL OSCILLATOR CHAINS. THESE ARE USED TO PROVIDE INJECTION FREQUENCIES FOR CONVERTERS AND TRANSVERTERS FOR THE BANDS 144 THRU 2304 MHz.

THE DESIGN WAS FIRST INTRODUCED BY K3MWV. IT WAS CONTRIBUTED TO WA3AXV, W3HQT, AND WA3JUF. THE DESIGN ASSUMES THAT CRYSTALS OF GOOD QUALITY AND ACTIVITY WILL BE USED. WHEN ORDERING CRYSTALS, PARTICULARLY THOSE FOR UHF USE, SPECIFY PLUS OR MINUS 0.001 PERCENT TOLERANCE. ATTEMPTS TO PULL A CRYSTAL IS NOT RECOMMENDED. TO DO SO MAY RESULT IN INSTABILITY AND POOR STARTING.

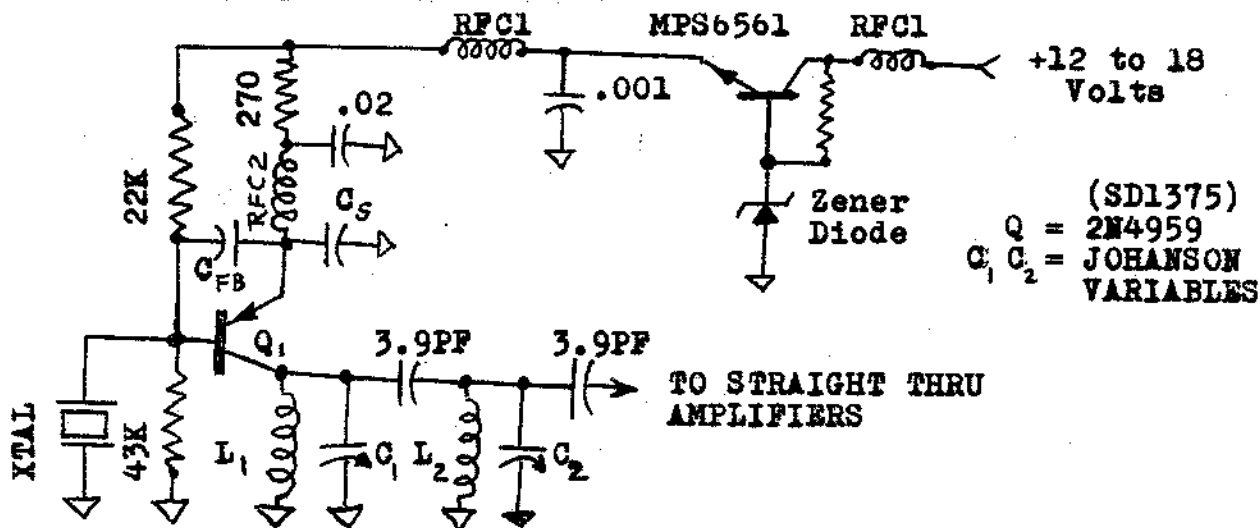
DAVE WA3JUF ADDS THE FOLLOWING:

1. MULTIPLYING IS DONE IN THE OSCILLATOR COLLECTOR CIRCUIT. THEN STRAIGHT THRU 2N4959 AND A 2N3866 STAGE ARE USED TO PRODUCE THE REQUIRED L.O. POWER.
2. L₁ C₁ AND L₂ C₂ CAN BE CHANGED TO THE FUNDAMENTAL FREQUENCY IF DESIRED AND MULTIPLIER STAGES ADDED INSTEAD OF STRAIGHT THRU AMPLIFIERS.
3. NO TEMPERATURE COMPENSATION IS SHOWN, BUT MAY BE DESIRABLE IF THE EQUIPMENT IS GOING TO BE USED WHERE THE AMBIENT TEMPERATURE IS EXPECTED TO VARY TO ANY EXTENT.
4. REFERENCE TO THE USE OF FREQUENCY MULTIPLIER STAGES IN 2 ABOVE. ONE SHOULD BE AWARE THAT THE USE OF MULTIPLIER STAGES CAN PRODUCE SOME STRONG HARMONICS WHICH CAN LEAD TO RECEPTION OF SPURIOUS SIGNALS AND POSSIBLE INTERFERENCE IN CATV EQUIPMENT.

OUR THANKS TO DAVE, WA3JUF, FOR HIS EFFORT IN DEVELOPING THIS INFORMATION ^{AND} FOR HIS PERMITTING THE PACKRATS AND FRIENDS TO USE IT.

W2EIF

2N4959 OSCILLATORS FOR LOCAL OSCILLATOR CHAINS 144 TO 2304 MHZ.
 INFORMATION COMPILED BY DAVE MASCARO, WA3JUF, 1981.
 SCHEMATIC:



USED ON BAND	CRYSTAL FREQ MHZ	COLLECTOR TUNES (TIMES) CRYSTAL	L ₁ C ₁ & L ₂ C ₂ TUNES LO CHAIN FREQ	C _S PF	C _{FB} PF	L ₁ & L ₂			C ₁ C ₂ PF	RFC 1 μ h	RFC 2 μ h
						TURNS	# WIRE	WOUND ON			
144	38.66667	X3	116.000	39	47	5	22	1/8ID	15	1.8	1.0
220	76.000	FUND	76.000	15	50	10	26	C ₁ C ₂	20	1.8	.33
220	77.600	FUND	77.600	15	50	10	26	C ₁ C ₂	20	1.8	.33
220	64.000	X3	192.000	18	68	4	22	1/8ID	15	.82	1.0
432	67.33333	X6	404.000	62	18	4	22	1/8ID	15	1.0	1.0
1296	105.65833	X4	422.6666	18	18	2	24	C ₁ C ₂	10	.22	.22
1296	96.0000	X4	384.0000	27	15	4	24	C ₁ C ₂	10	.22	.22
1296	70.4444	X6	422.6666	39	18	2	24	C ₁ C ₂	10	.22	.33
2304	90.0000	X6	540.0000	27	12	1	22	C ₁ C ₂	10	.22	.22
2304	89.9875	X6	539.925	27	12	1	22	C ₁ C ₂	10	.22	.22

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CLUB REPEATER - 223.04/224.64 Mhz

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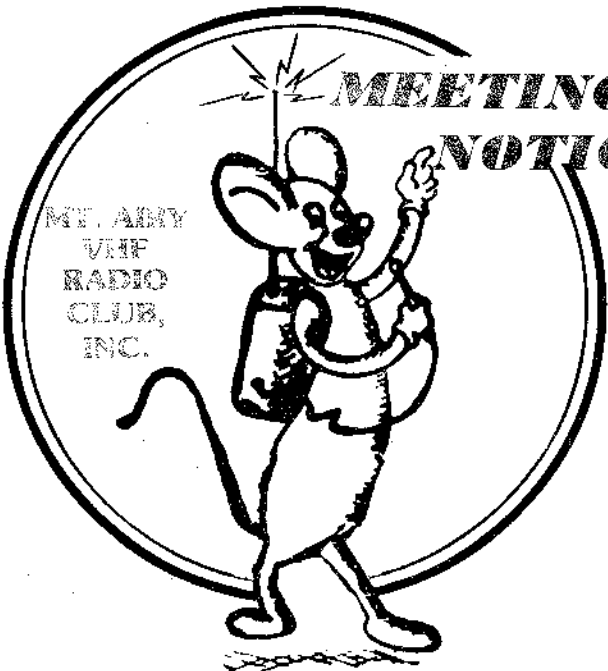
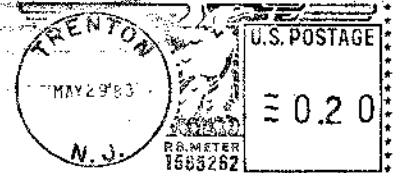
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