

PACK RATS'



CHEESE

BITS



CLUB CALL: W3CCX

MT. AIRY VHF RADIO CLUB, INC.

MT. AIRY VHF RADIO CLUB., "THE PACK RATS", PHILADELPHIA, PA.

NET FREQUENCIES: 50.125, 144.150, 222.125, 224.58/222.98, 432.110, 903.100, 1296.100 MHz

AFFILIATED CLUB: AMERICAN RADIO RELAY LEAGUE

W3CCX

ARNS

Meetings: Third Thursday of each month at 8:00 PM
Southampton Free Library, 947 E. Street Road
Southampton, Pennsylvania 18966

SCANNED TO PDF BY BERT, K3HUV, 2013

VOLUME XXXV

JANUARY 1993

NUMBER 1

THE PREZ SEZ

Happy New Year to all. 1993 promises to be a great year for the rats. Now is the time to make those new year resolutions. I am a little late in writing this because the band opened the night of December 15, 1992. And what an opening! Unfortunately by the time I was aware something was unusual, it was over in this area. I blamed this on fortune, in this case the "Wheel of Fortune" which occupied the TV from 7:00 to 7:30 PM. At 7:30 when the TV was returned to the master of the house, I noticed that channel 10 was experiencing interference. As we are on cable, I found this unusual and decided to turn on the ham equipment. By 7:35 I found that 2 meters through 432 was opened to Florida on Tropo. There was even a contact to Florida made on 1296 by W1RIL. But I was too late and the duct had passed this area. All I could do was listen to the people in New England have a great time.

So with all this excitement in late December we have a lot to look forward to in 1993. Maybe the band will open during the January contest! Don't forget that the date of the contest was changed to January 23 and 24 1993. See QST for details. You still have the opportunity to make the required two club meetings prior to the contest as it will fall after the regular club meeting and the directors meeting in January. If you can't make them still plan to get on the air and give out points. Your logs can be sent in as check logs. Let's dedicate this test to the memories of our two deceased members, W3CL and W3ZD, Harry and Dave. I want to also wish the competition up in Rochester, KD5RO and crew the best in 1993. They have done much to close the gap between our two clubs scores in Jan.

In the last regular club meeting we struggled with a unusually long business meeting. The quorum was not present on a recount so the issue failed to pass and has been given to the board for resolution. My first New Year resolution is to keep the monthly business section short.

So to all a Happy safe and successful new year in 1993.

73's

William T. Murphy

W0RSJ FN20JR

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DEADLINE FOR ARTICLES AND SWAP SHOP IS THE MONTHLY MEETING DATE. NON-COMMERCIAL SWAP SHOP ITEMS-FREE OF CHARGE.

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(609) 783-9478

TRUSTEE OF CLUB CALL - W3CCX

Ron Whitsel, WA3AXV
(215) 355-5730

PACKRAT 222 MHz REPEATER - W3CCX/RPTR

222.98/224.58 MHz, Churchville, PA

OFFICERS: 1991-1992

PRESIDENT: W4RSJ, Bill Murphy
VICE-PRES: WB3JYO, Paul Drexler
REC. SECR: WA3AQA, Walt Zumbach
TREASURER: WA3JUF, Dave Mascaro
COR. SECY: WA2GFP, Geoff Krauss
DIRECTORS: N3AOG, Dick Comley (1 YRS)
WA3NUF, Phil Miguelez (1 YRS)
N3EXA, Brian Taylor (2 YRS)
K3ESJ, Bill Jaxheimer (2 YRS)

MONDAY NIGHT NETS

TIME	FREQ.	NET CONTROL
7:30 PM	50.125 MHz	K3EOD
8:00 PM	144.150 MHz	W2EIF
8:30 PM	222.125 MHz	WB2YEH
8:30 PM	224.58R MHz	K3ACR
9:00 PM	432.110 MHz	WA3AXV
9:30 PM	1296.100 MHz	WA3NUF
10:00 PM	903.100 MHz	N3AOG

COMMITTEE CHAIRMEN

LADIES' NIGHT: WA3YUE 215-666-1558
JUNE CONTEST: N3CX 215-679-7293
HAMARAMA: K3EOD 215-742-3312
VHF CONFERENCE: KB3XG 215-270-3158



THE AMERICAN RADIO RELAY LEAGUE

QST

HUGH A. TURNBULL, W3ABC
Director, Atlantic Division

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WILMINGTON, DEL. 19803

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Lynne D. Whitsel

209 Frog Hollow Road
Churchville, PA 18966
215 355-5730

Calendar of Coming Events-January 1993

- 1 New Years Day.
- 3 Predicted peak of the Quadrantids meteor shower at 1234 UTC.
- 14 Board of directors meeting at the QTH of Ernie, W3KKN. All interested parties welcome. Call 215-659-3485 for directions. Meeting starts at 8:00 P.M.
- 18 Martin Luther King Jr. Day.
- 21 Regular meeting of the Mt. Airy VHF Radio Club at the Southampton Free Library on Street Rd. in Southampton, Pa. All VHFers and would be VHFers and friends are welcome. Last meeting before THE CONTEST.
- 23-25 THE CONTEST. 46th Annual ARRL January VHF Sweepstakes. See Dec. QST page 124 for the rules.

The December Coastal Opening

On 12 Dec. 1992 there was a big coastal opening to Florida. At about 1900, I went to the shack to check out some antenna systems after the bad winds and rain we had the past few days. I was testing on 2 meters when W4AVV called me from FM04. We went up thru the bands to 432 MHz. Bill is always looking for openings from down there HI! When I signed with him on 432 I couldn't believe the stations in Florida calling me. First was WA4CHA/EL88, then WD4IXD/EL89, then KC4RPD/EL88 and NI4Z near Orlando. The east coast was having a big opening in December and it was exciting. There was KM4ID/EM93, K4KAE/FM02, W4KSV/FM07, WJ9B/FM06, K4AGV/EM96, and good old Bill, AA4TJ/FM08. About 1945, the duct started to move and the New England boys started to knock them out. Boy were they excited up there. Our old friends W1RIL and W1MBA had a blast. I even heard W1YHO in there. I never thought I'd work Fla. on 432. From my QTH I couldn't work anyone on the microwave band. The conditions here didn't favor it.

Listen for the weak ones and 73

Dave, N3CX

New Member

Voted to membership at the December meeting:

Dave Foster, WD5BRP
2120 Hillcrest Drive
Easton, Pa. 18042
215-253-7775 (H)
215-253-5903 (W)

TID BITS:

The calls of Packrats WB2YEH, WA3AQA, W3IIT, W0RSJ, and N3EVV showed up in the Sept. VHF Contest Wrapup in QST. W0RSJ and N3EVV were 1st and 2nd in the rover category for the Atlantic Division. W0RSJ was also 8th overall in the country for the rover category. WB2YEH was first in the SNJ section.

Packrats N3EVV and a multiop W0RSJ crew will also be roving in Jan.

TID BITS Contd:

Steve, KD2KQ, and Dave, KD5RO, of the Rochester VHF Group will be roving in Jan. Planned Grids are FN14, 24, 23, 22, 02, 03, 12 and 13.

Microwave Update 93 will be hosted at the Northwest Atlanta Hilton on 24-25 September. Jim, WA8NLC, and Rick, KK7B, are heading up the conference.

Health and Welfare

Al, K3EOD will be in the hospital starting 18 Dec.

Interesting Stuff from other Newsletters

Nov. terrestrial VHF+. Improvements to the Henry 200'X'A Series of VHF Amplifiers.

Dec. QEX. Zac Lau, KH6CP/1, describes his quest for a 1 dB NF on 10 GHz. He ended up with a 0.88 dB transverter without the switching relays.

Jan. CQ. Chuck, WB6IGP, in his column "Above & Beyond" continues his series on MMIC's and describes the construction of a noise head.

Sept./Nov NTMS Feed Point. Low Cost VHF-UHF RF Relay by John, K5ZMJ, Another Cheap 10 GHz IF and 3 Ft. Wire Grid Dish by Kent, WA5VJB.

1992 CHEESEBITS INDEX

<u>Month</u>	<u>ARTICLE</u>
Jan	50 MHz Receive Mixer/Diplexer and Post Amp (part of Paul's series on the design and construction of a 50 MHz transverter) by Paul, WB3JYO.
Feb	Microwave Frequency Standard by Keith, KOKE. New Twist in Microwave Transverters by Kent, WA5VJB. Pin Diode IF Switch by Al, WB5LUA. The Other Samuel Morse by Robert, VE3SV.
March	902/903 MHz Yagi Match by Dave, N3CX
April	The Relationship of Sensitivity and Noise Figure by John, KB3XG.
May	DC/DC Converter for 24 v Relays by Jon, GW4LXO.
June	The Strength of Masts by Dick, N3AOG. 20 Watt 903 MHz Linear Amplifier by Dave, WA3JUF.
July	Andrew Coaxial Cable Information Modifications for the SHF Systems 540 MHz LO by Paul, WB3JYO.
Aug	High Level RX Mixer Modifications for the 903 MHz "No-tune" Xvtr by Dave, N3CX
Oct	3456 MHz Isolator/Circulator by Dave, WA3JUF. Known 144 MHz and higher Beacons by terrestrial VHF+.
Nov	A "Crunch-Proof" 144 Receive Converter". 144 MHz GaAsFET Preamplifier by Paul, G1WBZ.
Dec	Local Oscillator for the 144 MHz Transverter by Paul, WB3JYO. 2304 MHz Class A Linear Amplifier by Dave, WA3JUF. Plumbing Parts as 7/8 Inch Hardline Connectors by Kevin, WB9GKA.

SWAP SHOP

Send non commercial swap shop items to the editor.

For Sale: HP432A Wattmeter with cable (new color) \$125. Sierra 164B wattmeter (without elements) \$25. MaCom 432 amp (for parts), 8x16x1.75 heatsink, chip caps, transistors, N conn \$10. dB Products 4303 100 watt load and hybrid coupler \$40. Call Gary, WA2OMY at 215-539-6409.

Let's Build a High Performance 222 MHz Transverter

By Dave Hackford, N3CX

Part #1, LO/X2 Multiplier/LO Amp/Power Divider

Over the next few months, we will be putting together a High Performance 222 MHz linear Transverter for the low end of the band. This month we will be looking at the local oscillator/X2 multiplier and the LO amplifier/power divider.

The oscillator circuit is a well proven design is stable and has low phase noise (1). The X2 multiplier will get us up to 194 MHz ($194 + 28 \text{ MHz} = 222 \text{ MHz}$ for Tx and $222 - 194 = 28 \text{ MHz}$ for Rx, simple isn't it?). If all circuits are dup'd as shown, you just have to peak for output. Keep the leads short. The LO amplifier is a real beauty and you'll be able to get more than enough LO to drive the mixers. It's always great to have plenty of clean LO and you have a lot with this circuit. I measured over 250 milliwatts after the filter before the power divider (AH! plenty of LO!). The SD1520 device is running class C and is very stable.

The construction method used here is the dead bug method and at 222 MHz, this method is still usable (2). I used a piece of G10 circuit board to build the sides and ends for a box. It works great and is good for the pocketbook (3). The mixers used for Tx is a Mini-Circuits SRA-2CR at about \$10 and for Rx is a Mini-Circuits SRA-1H at about \$21 (4).

Next month we will cover the Rx mixer unit and the Tx mixer/low level RF stages. So, let's go!! Order those crystals and mixers and let's build!

73 for now and listen for the weak ones (5).

- (1) Ham Radio magazine, March 1984. VHF/UHF World, Joe Reisert, W1JR.
- (2) 1988 ARRL Handbook 144/220 Linear Transverter by WB3JYO.
- (3) For parts call for these catalogs: Mouser Electronics, 1-800-346-6873 and Digi-Key, 1-800-344-4539.
- (4) MLC Distributors, 1495 Alan Wood Rd., Conshohocken PA. 19428, 215-825-3177.
- (5) David T. Hackford, N3CX, Box 138, Rd #2, Pennsburg, PA. 18073, Phone Wk 215-483-2030.

SWAP SHOP Contd

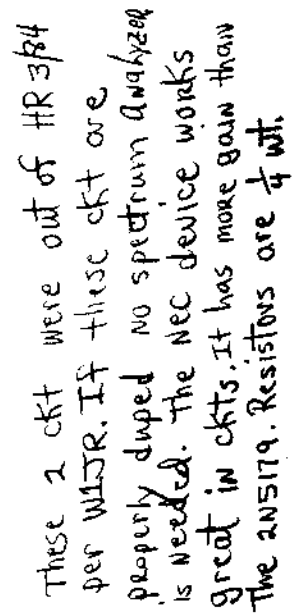
Wanted: FXR #30010267 120v. Antenna Relay with N conn., Phelps Dodge FX1250NM or NF connectors for 0.5" smooth hardline. Call Bill, W3VIR, at 215-357-6549.

For Sale: Henry Tempo 2002 2M 2KW Amp, \$750. IC-502A 6M SSB/CW Portable, \$225. 4 Way 2M Power Divider, \$25. 2 ea. 5/8 222 Mobile Antennas, \$5 ea. Call Marty, WB2GEZ, at 609-758-8865.

COMMERCIAL AD

LOOP YAGIS: 902 MHz 33 element \$89 kit, \$109 assembled and tested. 1296 MHz 45 element, \$89 kit, \$109 assembled and tested. 1296 MHz 55 element "Soooper Looper" \$99 kit, \$124 assembled and tested. 2304 MHz 45 element \$75 kit, \$89 assembled and tested. Also available: element and hardware kits for the above. 2 and 4-way power dividers. Discount on complete arrays. Solid State Linear Power Amps, 13 VDC: 1296 - 8W in 35W out \$315, 1W in 20W out \$265, 4W in 70W out \$695. GaAs FET Preamps: 903 MHz .8dB NF \$90, 1296 MHz .8 dB, 2304 MHz 1 dB max NF \$140. SHF SYSTEMS No-tune Transverter kits, w/144 MHz IF now available for 903 through 3456 MHz. Write or call for complete catalog. DOWN EAST MICROWAVE, Bill Olson, W3HQT, Box 2301 RR-1, Troy, Maine. For information and orders telephone (207) 948-3741.

11/92

multiplier

Q2 = NE 73432 2NS179

J_1 = Female SNC

Xtal-97mltz 5th OT.

HC-18 holder

C. = small trimmer / mouse* 24 AA072

C₂, C₅ = Small trimmer

C3, C4 = small trimmer/mouse # pt 24AA072

$L_1 = 8T \#24$ close wind, .1 inch ID

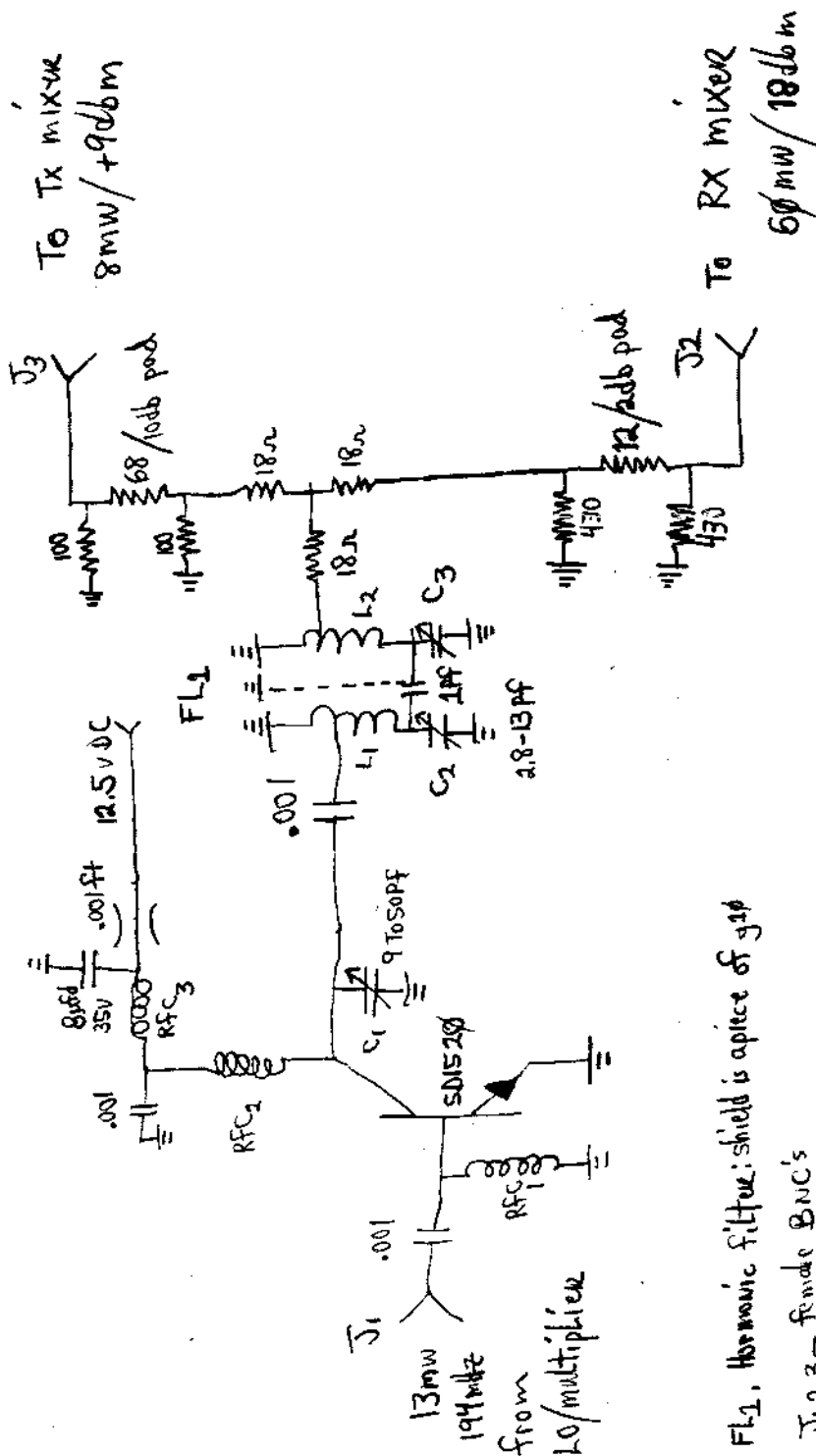
$$L_2 = .39 \mu\text{H} \text{ molded choke}$$

L3 = 10 T. #24 close wind, 1 inch ID, enameled wire

L4, L5 = 4T, #24 spaced wire dia., .1 inch ID

11/92

(194 kHz) LO Amp. - Filter & power splitter



FL1, Harmonic filter: shield is a piece of gld

J1,2,3 - female BNC's

RFL1,2,3 = 4T #24/.1" ID-spaced 1 wire

L1, L2 = 5T #18Tind, .25" ID spaced one wire dia. Toped 1T from gnd end.

C1 - 9 to 50PF / mouse Pt # 24AA074

C2, C3 - 3 to 13PF / mouse Pt # 24AA071

Notes: The SD1520P has mucho gain at 194, 20db gain and 250 plus mW out of filter. Varies with voltage & very stable. Make leads short and solder emitter leads so transistor is tight against board, a dab of heat sink compound under transistor is good. ALL spurious are more than 50db down very clean LO.

DAVE HUCKFORD: N3CX



VHF/UHF CENTURY CLUB AWARD RULES

1. (a) The VHF/UHF Century Club Award (VUCC) is awarded for contact with a minimum number of "Maidenhead" 2 degree X 1 degree grid square locators per band as indicated below. Grid squares are designated by a combination of two letters and two numbers. More information on grid squares can be found in January 1983 QST, pp. 49-51 (reprint available on request). The ARRL World Grid Locator Atlas and the ARRL Grid Locator for North America (see latest QST for prices and ordering information). The VUCC certificate and endorsements are available to ARRL members in Canada, the U.S. and possessions, and Puerto Rico, and other amateurs worldwide.

(b) The minimum number of squares needed to initially qualify for each individual band award is as follows: 50 MHz -- 100; 144 -- 100; Satellite -- 100; 220 MHz -- 50; 432 MHz -- 50; 902 MHz -- 25; 1296 MHz -- 25; 2.3 GHz -- 10; 3.4 GHz -- 5; 5.7 GHz -- 5; 10 GHz -- 5; and Laser -- 5. Certificates for 220 and 432 MHz are designed as Half Century, 902 and 1296 MHz as Quarter Century, and those above SHE Awards.

2. Only those contacts dated January 1, 1983, and later are creditable for VUCC purposes.

3. Individual band awards are endorsable in the following increments:

(a) 50 and 144 MHz and Satellite -- 25 credits; (b) 220 and 432 MHz -- 10 credits; (c) 902 MHz and above -- 5 credits.

4. (a) Separate bands are considered as separate awards. (b) No crossband contacts permitted except for Satellite award. (c) No contacts through active "repeater" or satellite devices, or any other power relay methods are permitted for nonsatellite awards. (d) Contacts with aeronautical mobiles (in the air) do NOT count. (e) Stations who claim to operate from more than one grid square simultaneously (such as form the intersection of 4 grid squares) must be physically present in more than one square to give multiple square credit with a single contact. This requires the operator to know precisely where the intersection line are located and placing the station exactly on the boundary to meet this test. To achieve this precision work required either curfew markers permanently in place, or the precision work of a professional surveyor. Operators of such stations should be prepared to provide some evidence of meeting this test if called upon to do so. Multiple QSL cards are not required.

5. There are no specialty endorsements such as "CW only" etc.

6. For VUCC awards on 50 through 1296 MHz and Satellite, all contacts must be made from a location or locations within the same grid square or locations in different grid squares no more than 50 miles apart. For SHF awards, contacts must be made from a single location, defined as within a 300-meter diameter circle.

7. APPLICATION PROCEDURE (please follow carefully):

(a) Confirmations (QSLs) and application forms (MSD-259 and MSD-260) must be submitted to an approved VHF Awards Manager for certification. ARRL Special Service Clubs appoint VHF Managers whose names are on file at Hq. If you do not know of an Awards Manager in your area, Hq. will give you the name of the closest manager. DO NOT SEND cards to Hq.

(b) For the convenience of the Awards Manager in checking cards, applicants may indicate in pencil (pencil only) the grid square locator on the address side of the cards that DO NOT clearly indicate the grid locator. The applicant affirms that he/she has accurately determined the proper locator from the address information given on the card by signing the affirmation statement on the application.

(c) Cards must be sorted by: (1) Alphabetical by field; (2) Numerical from 00 to 99 with in that field.

(d) Where it is necessary to mail cards for certification, postage equal to the amount needed to send them will be included for return of cards along with a separate self-addressed mailing label. In addition, U.S. and Canadian applicants will enclose \$1.00 U.S. for any initial application to cover postage and packaging of the certificate. For endorsements, enclose an S.A.S.E with appropriate postage for the weight of your summary sheets. When mailing cards, REGISTERED or CERTIFIED mail is recommended.

(e) Enclosed with the initial VUCC certificate from Hq. will be a photocopy of the original list of grid squares for which the applicant has received credit (MSD-259). When applying for endorsement, the applicant will indicate in RED on that photocopy those ne grid squares for which credit is sought, and submit cards for certification to an Awards Manager. A new updated photocopy listing will be returned with the endorsement sticker. Thus, a current list of grid squares worked is always in the hands of the VUCC award holder, available to the VHF manager during certification, and a permanent historical record always maintained at Hq. Reminder: for initial application, enclosed \$1.00 and for endorsements, enclose an S.A.S.E with appropriate postage for the weight of your summary sheets. For endorsement applications, it is only necessary to submit those MSD-259s that indicate new grid squares worked since the previous submission (indicated in RED).

8. DISQUALIFICATION. Altered/forged confirmations or fraudulent applications submitted may result in disqualification of the applicant from VUCC participation by action of the ARRL Awards Committee. The applicant affirms he/she has abided by all the rules of membership in the VUCC and agrees to be bound the decisions of the ARRL Awards Committee.

9. Decisions of the ARRL Awards Committee regarding interpretation of the rules here printed or later amended shall be final.

10. Operating Ethics: Fair play and good sportsmanship in operating are required of all VUCC members.

MSD-261(392)

ARRL VUCC AWARD APPLICATION



1. Please PRINT. 2. Use separate application for EACH band.

Call: _____

Name: _____

(Print exactly as you want it on certificate)

List any ex-calls used on
any cards submitted:

Address: _____

(number and street)

(City, State/Country, ZIP/PC)

FOR RETURN POSTAGE

Money/Stamps enclosed

\$ _____

Include \$1 for certificate or S.A.S.E.
(with appropriate postage for the
weight of your summary sheets)
for endorsement.

Return my cards via:

- ☐ Registered
☐ Certified ■ U.S. only
☐ United Parcel Service
☐ First-class mail

Membership control number (from your QST wrapper) : _____

☐ Initial application (check one) ☐ Endorsement
BAND (check one only): ☐ 50 ☐ 144 ☐ 220 ☐ 432 ☐ 902 ☐ 1296
☐ 2.3 ☐ 3.4 ☐ 5.7 ☐ 10 ☐ 24 ☐ 47 ☐ Laser ☐ Satellite

INITIAL applicants: _____

Number of grid squares claimed.

ENDORSEMENTS

_____	+	_____	=	_____
Number		Number additional		NEW TOTAL
previously credited		in this application		

The undersigned affirms he/she has read, understood, and abided by the rules of the VUCC (MSD-261).

Signature _____ Date _____ 19 ____

*****VHF AWARDS MANAGER VERIFICATION*****

Grid square credits claimed on this application have been verified as correct and true.

TOTAL number of grid squares credited = _____

_____	_____	V-_____	_____
(signature)	(call)	(Mgr. 4-digit code #)	(date)

*****DIRECTIONS TO APPLICANT*****

1. Fill out this application and MSD-259. Read the VUCC Rules (MSD-261) carefully.
2. Enclose postage sufficient for return of cards (if mailed), and return address label.
3. For initial applicants, enclose \$1.00 U.S. for mailing certificate (W/VEs only).
4. For endorsement, enclose S.A.S.E. with appropriate postage for the weight of your summary sheets.
5. Sort QSLs alphabetically by field, and numerically within the field, from 00 to 99.
6. Forward cards to nearest VHF Awards Manager (see attached information). DO NOT SEND CARDS TO ARRL HQ.

Field:
(first 2 letters
of locator)

--	--



Field:
(first 2 letters
of locator)

--	--

SQ	Callsign	SQ	Callsign
00		50	
01		51	
02		52	
03		53	
04		54	
05		55	
06		56	
07		57	
08		58	
09		59	
10		60	
11		61	
12		62	
13		63	
14		64	
15		65	
16		66	
17		67	
18		68	
19		69	
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31		81	
32		82	
33		83	
34		84	
35		85	
36		86	
37		87	
38		88	
39		89	
40		90	
41		91	
42		92	
43		93	
44		94	
45		95	
46		96	
47		97	
48		98	
49		99	

ARRL VUCC AWARD CALLSIGN:

☐ 50 ☐ 144 ☐ 220 ☐ 432 ☐ 902 ☐ 1296 ☐ 2.3 ☐ 3.4
☐ 5.7 ☐ 10 ☐ 24 ☐ 47 ☐ Laser ☐ Satellite

DIRECTIONS: This side of tally sheet good for two fields. 1. Enter your callsign and check band. 2. Enter two-letter field. 3. Enter callsign of stations worked in appropriate grid square. 4. Total grid squares for each field.

SQ	Callsign	SQ	Callsign
00		50	
01		51	
02		52	
03		53	
04		54	
05		55	
06		56	
07		57	
08		58	
09		59	
10		60	
11		61	
12		62	
13		63	
14		64	
15		65	
16		66	
17		67	
18		68	
19		69	
20		70	
21		71	
22		72	
23		73	
24		74	
25		75	
26		76	
27		77	
28		78	
29		79	
30		80	
31		81	
32		82	
33		83	
34		84	
35		85	
36		86	
37		87	
38		88	
39		89	
40		90	
41		91	
42		92	
43		93	
44		94	
45		95	
46		96	
47		97	
48		98	
49		99	

TOTAL number of grid squares
worked in this field =

TOTAL number of grid squares
worked in this field =

DOWN EAST MICROWAVE

MICROWAVE ANTENNAS AND COMPONENTS

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W3HQT

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CRAIG HENDERSON
N8DJ8

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Mrs. 10-5



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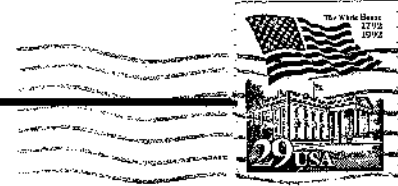


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