

PACK RATS'



PACK RATS

CLUB CALL: W3CCX

MT. AIRY VHF RADIO CLUB, INC.

CHEESE BITS



MT. AIRY VHF RADIO CLUB., "THE PACK RATS", PHILADELPHIA, PA.
NET FREQUENCIES: 50.150, 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, K3IUV, 2013

VOLUME XXXVI

July 1994

Number 7

THE PREZ SEZ

Thanks to Bob Topper for a very interesting presentation on High Definition Television. It was interesting to get a glimpse of what's involved in this new technology. An immense amount of research and development has been invested in this technology in order to make it a viable consumer product. I believe we'll be seeing this product on the market very shortly. I suspect hams will be getting involved too, sooner or later.

Congratulations on our new slate of officers! We're very fortunate as a club to have so many talented individuals as members, some of whom are now serving as your new officers. It takes a diverse set of skills to efficiently run an organization like ours. Often, when most of us are lacking in a particular skill or experience there's usually someone else stepping forward to help get the job done. Let's try to do everything we can to support our new Board and it's activities for this year. Why not consider doing something new for the club? Why not consider being that person who steps forward when you see you can lend a hand? In order to avoid burn out we all need assistance and encouragement to accomplish our goals. Whether it be starting a club project, getting members on new bands, editing and assembling Cheesebits, or organizing the VHF conference, all these jobs go a lot more smoothly if people simply volunteer. Who knows, maybe you'll be able to suggest something or assist in a way that will make some new things happen!

I can say for myself that it's a privilege to serve The Rats in the capacity of President. While by no means an easy job, my first term as President has given me the opportunity to get to know many of our membership better, and to try a few new things as a club. I have a few ideas for new things to try but I'd rather hear from the membership. What goals should we be pursuing as a club this year? What can we do to help more members get on new bands? What can we do to help members improve the bands they already have? I'm looking forward to hearing from as many Rats as possible within the next few weeks.

This month we'll hold our first outdoor meeting of the year - the White Elephant sale at Gary's, WA2OMY's. Gary has been working on cleaning out his basement again so there's bound to be some good stuff of interest to the VHF'er. Seating will be limited so try to be at Gary's early. This is always a fun time at Gary's. Why not bring a friend along?

Cu on the bands!

73, Paul Drexler, WB3JYO

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

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Joe Kilgore, W2EIF
(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: 1993-1994


PRESIDENT: WB3JYO, Paul Drexler
VICE-PRES: WB2OMY, Gary Hitchner
REC. SECR: WA3AQA, Walter Zumbach
TREASURER: WA3JUF, Dave Mascaro
COR. SECR: N3AOG, Dick Comly
DIRECTORS: WA3AXV, Ron Whitsel (1 YRS)
WB2YEH, Bob Fisher (1 YRS)
N3ITT, Alan Sheppard (2 YRS)
WA3NUF, Phil Migulez (2 YRS)

MONDAY NIGHT NETS

<u>TIME</u>	<u>FREQ.</u>	<u>NET CONTROL</u>
7:30 PM	50.150 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 610-630-1875
JUNE CONTEST: WB3DNI 215-672-5289
HAMARAMA: WB3JYO 609-538-1687
VHF CONFERENCE: KB3XG 610-584-2489

THE AMERICAN RADIO RELAY LEAGUE**QST**

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Director, Atlantic Division


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Lynne D. Whitsel

209 Frog Hollow Road
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215 355-5730

- 3 **Annual Wilkes-Barre Murgas ARC K3YTL Hamfest** will be held on Rte 118 in Dallas, PA. TI on 146.61R and .52. VE Exams.
- 4 **Independence Day**
- 4 **Harrisburg Hamfest** at the Bressler Picnic Grounds, take exit 1 off I 283, follow PA 441 and signs. Admission: \$3. Talk-in on 146.76/R and .52.
- 7 **Arietids meteor shower peaks at 1444 UTC.**
- 9-10 **CQ Worldwide VHF QPX Contest.** See May CQ Magazine page 60 for rules or June QST page 118. Contest runs from 1800 UTC, 9 July to 2100 UTC on 10 July (27 hours). All bands from 50 MHz up.
- 10 **Maryland Hamfest,** Timonium, Md. at the Maryland State Fairgrounds, located on York Rd. adjacent to I-83 near I-695 Talk-in on 147.63/.03, 146.16/.76, and 146.52.
- 14 Packrat **Board of Directors meeting** will be held at the QTH of Al, N3ITT at 8:00 PM. All interested parties welcome. Call 215-847-5490 for directions.
- 16 **Red Rose Repeater Assn Hamfest** at Lancaster, Pa.
- 21 July meeting of the Packrats will be the **Annual White Elephants Sale** at Gary's Glen (WA2OMY's QTH) on Mt. Kirk Road in Eagleville, Pa. Starts promptly at 8:00 PM. Bring Chairs. For directions call 215-539-6409. See the enclosed map.
- 28-30 The 29th Annual **Central States VHF Conference** will be held in Memphis, Tennessee. at the Wilson World Hotel. For further information, contact Dave Meier, N4MW at 214-522-5003 or Fax at 214-521-0016.

ELECTION RESULTS

The annual election of officers held at the June meeting resulted in the following fine list to lead the club into the 1994-1995 year. Ron, WA3AXV, and Bob, WB2YEH, continue with the second year of their 2 year term.

<u>Office</u>	<u>94-95 Officer</u>
President	Paul , WA3JYO
Vice Pres.	Gary , WA2OMY
Rec. Sec.	Walt, WA3AQA
Cor. Sec.	Dick, N3AOG
Treas.	Dave, WA3JUF
Directors:	Al, N3ITT
	Phil, WA3NUF

SWAP SHOP

(send all ads to the editor)

For Sale: Tektronix 535A Oscilloscope with a Type CA Plug-In and a 547 with a 1A1 Dual trace Plug-In. Both need some work, \$ 25.00 or OBO. Call Harry, W3IIT at 610-584-4846.

For Sale: Kenwood TM3530, 222 MHz FM mpbile transceiver with CTSS encoder, like new, \$300.00. Kenwood TM-731A, 144/440 MHz dual band FM transceiver with CTSS decoder and encoder, manuals, and box, \$500.00. Call Bruce, WA3YUE at 610-630-1875.

Wanted: 100 to 125 ft. length of 1/2 or 7/8 inch hardline with N connectors. Call Bill, K3MFI at 215-968-2504.

ADDRESS & PHONE NUMBER CHANGE

Phi, WA3NUF, 215-830-5508 (W)

Chuck, WA3IAC
3446 Shelmire Ave, Philadelphia, Pa. 19136
215-335-0637 (H), 215-674-5100(W)

From: Mark Beckwith, WA6OTU - Chairman, CAC - wa6otu@caltech.edu
To: All CAC members, K8CH, W3EP, and for General Release
Date: May 18, 1994

On Wednesday, May 18, 1994 the Contest Advisory Committee of the American Radio Relay League voted to recommend that ~~some~~ changes to the rules of the Rover Category in the League's January, June, and September VHF competitions, as proposed by Emil Pocock, W3EP, be adopted.

The votes are not all in as of this writing. It was decided that as soon as a majority (9) was reached, a statement would be put out, and it must be noted that the votes against this proposal stand presently at 5 with two votes outstanding. Because of the delicate nature of this problem, and as directed in the ARRL's instructions to Advisory Committees, the opponents to this recommendation will submit a rebuttal at the same time as the recommendation is submitted, which is scheduled for June 15th. The biggest question left to answer is exactly how much would the proposed changes reduce the incentive of Rovers to cover as many grids as they do presently. There have been compelling arguments that fewer rare grids will wind up getting put on as a result of W3EP's proposal.

This event marks the culmination of months of effort by many individual hams. In terms of letters per unit time, this issue has generated the most correspondence of any issue ever before the Contest Advisory Committee. Because the issue centered around VHF and UHF Contesting, the CAC, which has traditionally been made up mostly of HF-oriented contesting experts, was not fully prepared to deal with it. This issue has served to stretch the Advisory Committee structure beyond any prior limits. The handling of this issue has brought to light shortcomings in our procedures never before addressed.

There have been many criticisms of the CAC regarding this issue, and I wish to personally assure every VHFer who has raised an eyebrow over this to rest in the knowledge that important lessons have been learned in virtually every corner of the operation of the CAC.

The Contest Advisory Committee wishes to express its thanks to the 40 amateurs and clubs who took the time to express their thoughts in the form of 32 letters and 8 postcards, making up over 100 pages of comments to read and digest, in addition to the mass of internal correspondence about this matter. We especially thank everyone for their patience.

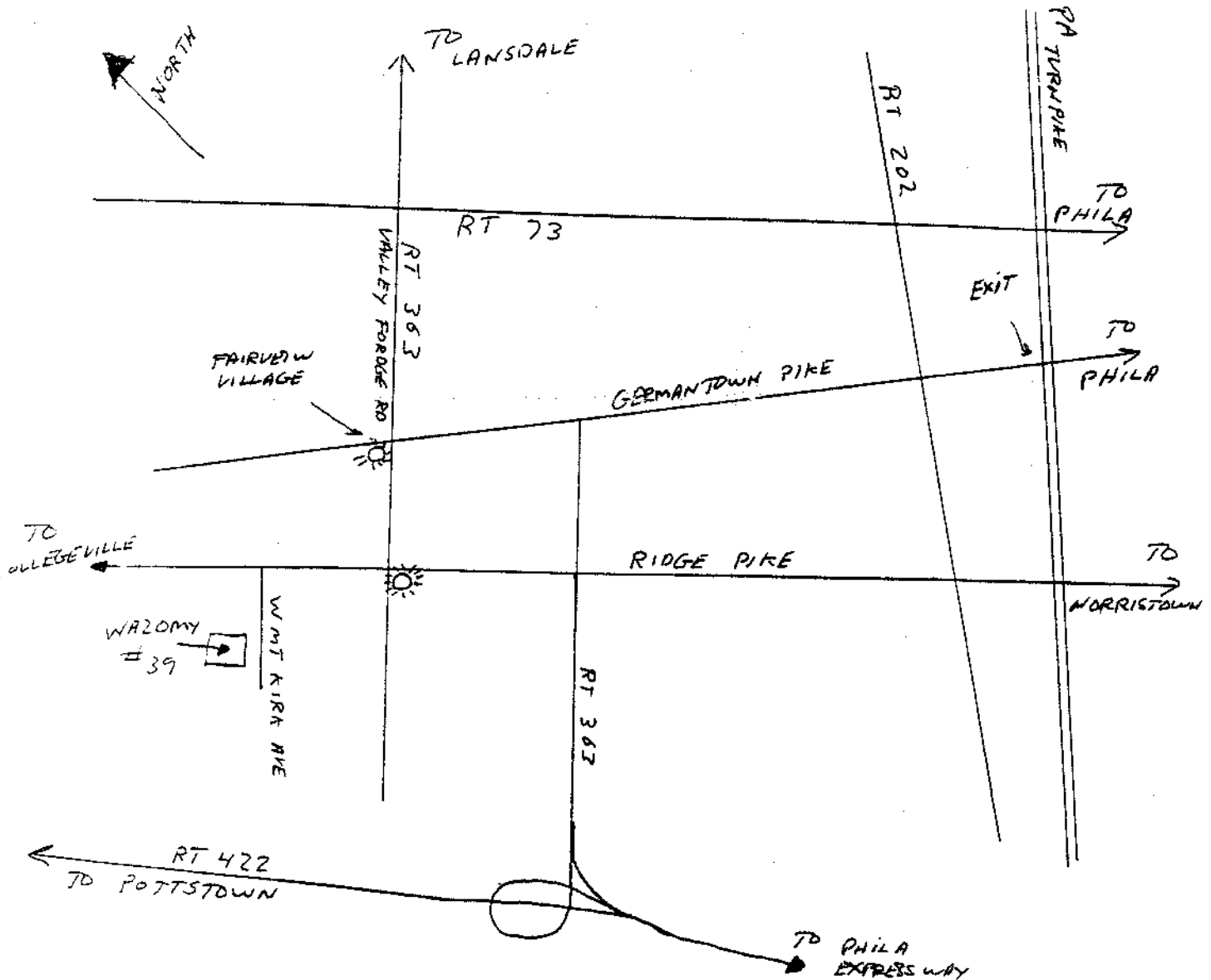
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JULY AUCTION AT THE OTH OF WA2OMY

By: Gary, WA2OMY

It is time once again for the annual Pack Rat "White Elephant Sale". Pull out the items which you have been skinning your shins on under your operating table, and bring them to the July meeting. The participants last year appeared more than pleased with the variety of material available. Word has it that the experienced Pack Rat auctioneer will again be available for service. Plenty of refreshments will be available.

A note on parking: Parking WILL BE permitted on the lot adjacent to WA2OMY, as long as it is limited to streetside. Please pull "nose-in" enough to clear the street (At a right angle to the street). This way there should be plenty of parking. Again the driveway should be kept clear for the loading and unloading of usable items. SEE EVERYBODY ON THE 21ST!



TID BITS

The April/May issue of the NTMS "Feedpoint" had a great many interesting articles: KLM Echo 70 Mods by Kent, WA5VJB, An Inverter for 400 HZ Power by Paul, N1BWT, HEMT has broken through a barrier of 2.0 dB of NF for 24 GHz by Toshihiko, JE1AAH, A Simple 5 Band CW Transceiver (for 2.3, 3.4, 5.7, 10.3, and 24.2 GHz) by Rick Campbell, Shielding No-Tune Printed Filters by Rick Campbell, and Subharmonic IF Receivers by Rick Campbell

Jimmy, W6JKV is planning on operation from KG4 from July 7 to 14.

VISITORS AT THE JUNE MEETING

Bob Topper, HDTV Expert, Hatboro, Pa.
W3KOC, Bill Nicholson, Willow Grove, Pa.
WA3RTL, Ben Kelsall, Unionville, Pa.
N3FVS, Jason Gorodetzer, Holland, Pa.

DUES ARE DUE

As of June 16, the following members dues had not yet been received by the treasurer:

WA3AAJ
W3HMU
WB8ZAR
K3JJZ

K3GYS
W3VIR
KF6AJ

KS2T
WU3C
WA3IWT

N3BBI
W2HX
WB2GEZ

PRELIMINARY SCORES-JUNE VHF OSO PARTY

Call:	W2SZ/1	N2WK	W3CCX	W3ZZ	K1TR	WA2TEO
Score:	884,918	859,680	443,460	426,000	?	216,000
Grid:	FN31	FN03	FN21	FN00	FN20	FN31
Band						
50	395/70	293/92	293/52	390/106	438/86	202/55
144	594/52	428/64	513/54	433/57	749/50	344/41
222	159/52	180/47	126/31	94/33	137/35	82/29
432	284/40	221/47	224/37	171/39	261/38	124/35
903	58/21	77/32	38/17	22/16		21/15
1296	91/24	86/29	55/18	38/16	?	31/14
2304	53/17	46/23	21/9	8/6		5/3
3456	41/10	17/14	8/3			
5760	30/7	9/7	5/3			
10 GHz	41/7	16/3	5/3			
24 GHz	19/7	6/2	1/1			
144 GHz	1/1					

CHEESEBITS SUBSCRIPTIONS

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Street Address: _____
Town: _____ State: _____ ZIP: _____

Subscription Rate: \$10.00 per year (USA), \$12.00 (Canada), \$15.00 (Worldwide)

July 94

Send to: SUBSCRIPTION/ADVERTISING MANAGER:

Bob Fischer, WB2YEH
7258 Walnut Avenue
Pennsauken, NJ 08110

MORE PIPE CAP MANIA

By: John, KB3XG

I needed a band pass filter to reduce the noise bandwidth of my 3456 MHz receiver lineup. I tried the beg borrow or steal method with no success. Bill W3HQT gave me a copy of a 5760 MHz transverter article which used pipe cap filters on the mixers. I scaled the dimensions for a 3456 version and it just so happens that a 1 1/2" pipe cap works fine.

I used a 2" square piece of 0.063" G-10 fiberglass board, 2 pieces of 0.085" semi-rigid with SMA's, a 1 1/2" 10-32 brass screw, and 2 brass nuts. The probe spacing = $\lambda/4$ (0.854" @ 3456 MHz) and the probe length = $\lambda/8$ (0.427" @ 3456 MHz).

The semi-rigid shield should protrude 1/16" into the cavity side. Solder the coax on both sides of the PC board for mechanical strength. Measure the length of the probes after completing the soldering process. The heat may cause the teflon to walk out of the copper jacket. Drill a hole in the top of the pipe cap and solder the brass nut to the cap. Use the other nut as a jam nut to assure a good electrical contact to the pipe cap.

Secure the pipe cap to the PC board using 2 small C-clamps. Connect your DownEast no-tune or equivalent to the filter. Move the pipe cap around to minimize the filter loss. Simultaneously re-tweak the tuning screw to find the optimum spot for the shell and screw. Tighten the C-clamps and solder the pipe cap to the PC board.

I can't believe this thing works as well as it does. I got about 1 dB loss at 3456 MHz with a 3 dB bandwidth of about 50 MHz. The filter dropped off rapidly below 3.4 GHz, but flat topped above 3.4 GHz. There was another peak at 7 GHz where the probes are 1/4 waves. This works fine for us since we are trying to reject our LO signal. WA3NUF sez that shortening the probes will increase the loss but sharpen the filter skirts. Feel free to experiment at your own expense. The pipe caps are 2 bucks a piece, so you don't have to feel bad about scraping a cap or two.

<u>Freq.</u>	<u>Loss</u>
<u>GHz</u>	<u>dB</u>
2.0	-54
2.5	-43
3.0	-31
3.42	-4.4
3.45	-1.1
3.48	-4.0
4.0	-20
4.5	-22
5.0	-27

A 144 MHz SD1273 LINEAR AMPLIFIER

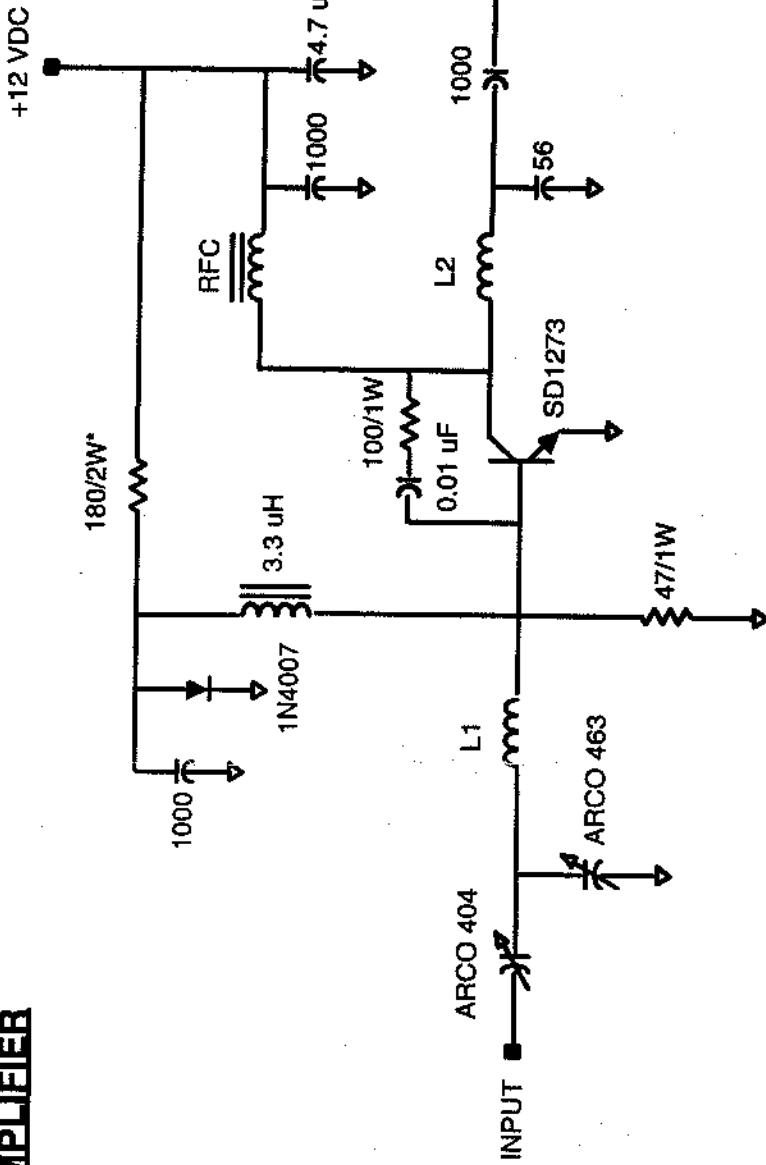
By Paul, WB3JYO

The Thomson SD1273 transistor was chosen for the next 2 amplifier stages in the 144 MHz transmit converter. While this particular transistor is rated for nearly 10 watts class AB, it's emitter balasting allows it to be biased class A for good linearity. The circuit shown provides 15 dB gain at 144 MHz, a compression point of nearly 1 watt, and intermod products better than 40 dB down when operated at the required power levels. The Thomson SD1273 is one of the few available VHF transistors that meets the bill.

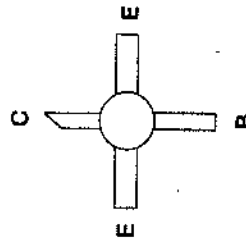
The diode bias scheme used here is simple but adequate for this transistor. Feedback is used to improve the input match and aid in stability. Construction is straightforward; use point to point construction on double sided circuit board, keeping all lead lengths to a minimum. The entire circuit board may be mounted onto a small enclosure, forming a lid. Mount the transistor and attach the heatsink before installing any other components. Use a small amount of thermal grease between the transistor stud and the heatsink. Wherever an RF ground is required drill a small hole and solder a small gauge buss wire to the opposite side ground. Use this technique under the transistor emitter leads and capacitor grounds.

Once the circuit is completed, apply 12 VDC using a current limited power supply and a milliammeter in series with the supply. Adjust the value of the 180 ohm resistor until approximately 150 mA of current is noted; if more current is needed simply add a larger resistor in parallel with the 180 ohm resistor, if less current is needed use the next size larger resistor or add resistance in series. With the transistor biased properly apply a low level 144 MHz CW signal and tune both input capacitors for maximum power as indicated on a power meter.

144 MHz SD1273 LINEAR AMPLIFIER



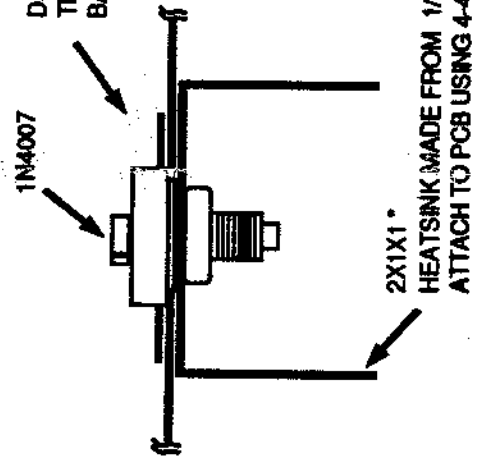
THOMPSON_SD1273



NOTE

- L1 2 turns #20 AWG, 0.125" ID
 - L2 3 turns
 - RFC 10 turns #26 AWG enameled on 100 ohm/1W
- Mount diode on transistor cap as shown.
 * Adjust value to obtain proper Icq quiescent current.

DRILL CLEARANCE HOLE
 THRU PCB TO ALLOW TRANSISTOR
 BASE TO FIRMLY CONTACT HEATSINK



GAIN=15 dB @ 144 MHz
 Icq=150 mA
 P1dB=+39 dBm
 STABLE INTO 10:1 VSWR
 IMD=-40 dBc @ +32 dBm
 WB3JYO 6-94

JUNE OSO PARTY REPORT

By: Pat, WB3DNI

I want to thank all who participated in the Pack Rat effort for this years June VHF QSO Party. The operators included WB3JYO, N3OZO, K2UYH, K3ESJ, K3MFI, K3UA, N3EVV, N3EXA, N2GSA, N3ITT, N3NGE, W3GAD, WA3AXY, WA1YHO, WB2YEH, WA3JUF, WA3NUF, WA3YUE, and myself, WB3DNI. Other personel seen assisting in setup and supplying moral support were W3KKN, N3AOG, KA3MGB, KB3IB, W3IIT and I am sure that there were others whom I have missed. The food crew did a super job and special thanks go out to N3OZO, and N3ITT for the extra work that went into preparation and cleanup after the event. A total of 30 separate Rats were worked during the contest with 102 separate contcts.

The effort got under way Wednesday when Paul, WB3JYO, got the first truck and went down to Rick, WC2K's, to pick up the equipment that we usualy get from him. The other truck was rented on Thursday and all the loading was completed. I should mention that most of the equipment is transported in peoples cars, so there is a lot of loading and unloading that we never hear about.

We arrived on the Camel Back mountain at about noon on Friday and began the task of setting up the 9 towers and all the equipment. I don't know of any station that was not on the air at the start of the event. Extra equipment was set up in anticipation of some EME activity on 2 meters. N3AOG drove up special with the 8' mobile dish setup for 10 GHz EME. Unfortunately none of the contacts were established, but we have learned a lot for next year. We will be out listening for sun noise with every reflecting device we come across!

When the event was over, most of the crew just went to bed. I think we were a little on the tired side!. Monday tear down was acomplished in good time (aided by rumors of big winds, rain and the "L" word coming up from the south. (I'll have to try that again next year!). The score was down from last year. I think this reflects a lower activity level this year.

<u>Band</u>	<u>OSO</u>	<u>X pt</u>	<u>= OSO pts</u>	<u>X Grids</u>	<u>= Points</u>
50	293	1	293	52	15,236
144	513	1	513	54	27,702
222	126	2	252	31	7,812
432	224	2	448	17	16,576
903	38	3	114	17	1,938
1296	55	3	165	18	2,970
2304	21	4	84	9	756
5760	5	4	20	3	60
10368	5	4	20	3	60
24000	<u>1</u>	4	<u>4</u>	<u>1</u>	<u>4</u>
Totals	1,289		1,945	228	443,460

Again thanks to all and we're looking forward to next year. (I must be ill!).

GARY's TEST EQUIPMENT CORNER- More on Power Meters

By Gary, WA2OMY

Reprinted in this issue is some excellent material found published in the North Texas Microwave Society newsletter "Feedpoint". Some additional points are mentioned with regard to the shock handling and thermistor operation in the HP 478power sensor head. Refer to the article in April 1994 Cheesebits while reading the information here

A 144 MHz 2N3866 LINEAR AMPLIFIER

By Paul, WB3JYO

A 2N3866 amplifier stage follows the bandpass filter in the 144 MHz transmit converter. The schematic was presented in last month's Cheesebits. An inexpensive 2N3866 was chosen since it is commonly available and has excellent linearity at the required power level. When driven as required, the intermod products out of this stage are better than 50 dB down. The amplifier has a 9 dB gain and is stable into a 10:1 VSWR.

As with all stages, a point-to-point "dead bug" construction technique is recommended. Care must be taken to keep all lead lengths to a reasonable minimum. All resistors are 1/4 watt. Remember to keep the 2N3866 away from ground since the case is the collector. Use a small push-on type heatsink such as the Digi-Key heatsink listed. Wind the transformer as shown in the pictorial - wire size is not critical. The 2N3866 stage may be housed along with the mixer/MMIC/filter combination, or housed perhaps along with the following transmit stage. For those who want to experiment, a number of VHF transistors will probably work in this circuit with minimal modification necessary. Compression point and linearity will have to be checked, however.

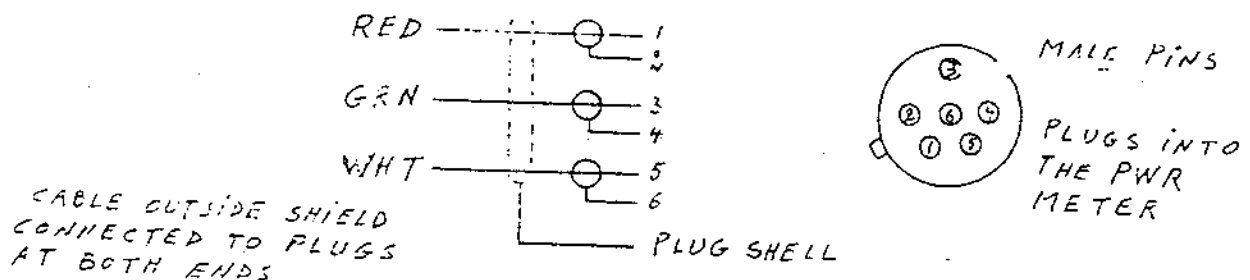
Notes for hp 432 and hp 478 by N5GO

432

- Refer to "Application Note 64" for Microwave Measurements.
- Before calibrating the instrument let it warm up for 10 minutes.
- RANGE switch on COARSE ZERO position shows the thermistor unbalance. Adjust COARSE ZERO for a reading of 0, then press down FINE ZERO switch for a particular range.
- Set CALIBRATION FACTOR according to the chart on the thermistor.
- Set MOUNT RESISTANCE to match the resistance of the thermistor, that is 200 ohms for a 478A and 100 ohms for a 486A.
- DO NOT APPLY ANY POWER into the thermistor mount when the RANGE switch is on COARSE ZERO or while depressing the FINE ZERO switch.
- RECORDER output is 1.00 volt ($Z=1000$ ohms) for full meter deflection. Normal cable length is 5'6". longer cables require the modification of some resistors inside the 432. (See manual)
- Sources of errors:
 - SWR, RF losses, mismatch, and instrumentation.
 - CALIBRATION FACTOR compensates for thermistor VSWR and RF losses when no tuner is used to match the impedances.
 - EFFECTIVE EFFICIENCY compensates for thermistor mount RF losses when a tuner is being used in the measuring system.
 - CALIBRATION FACTOR does not compensate for VSWR of the source.
- The rechargeable battery (Option 001) is not available in the 432B 432B draws 8 watts whereas the 432A is only 1.5 watts.
- The boards A1 and A2 are the same in a 432A and a 432B.
- Don't exceed 10 mW normally, but NEVER EXCEED 30 mW average.
- DON'T EVER DROP a thermistor mount. Mechanical shocks will destroy the match between thermistors and increase susceptibility to drift.
- When using the instrument on micro-watt positions make sure that the mount and the equipment connected to it are at the same temperature or some drift will result.
- Make sure the 432 is set on 200 ohms if a 478A is connected to it. If set on 100 ohms the thermistor will probably suffer some damage.
- Internal adjustments and calibration are best achieved using hp 8477.

478A

- The two COMPENSATION thermistors are connected in series and have a resistance of 200 ohms total. The DETECTION thermistors are the same way. Their total resistance is also 200 ohms and since the RF signal is fed in the middle, the input resistance is 50 ohms.
- The DETECTION thermistors are in the input cavity.
- The COMPENSATION thermistors are installed just outside the input cavity, thus not exposed to the incoming RF. they sense the ambient temperature. - C1 offers high impedance to DC/10 kHz BIAS but is a short for RF.
- Input capacitor C2 blocks any DC but passes the RF.
- The BIAS in a 432 is DC, unlike the 431 where BIAS is DC and 10 kHz.



From the Dec 93/Jan 94 issue of NTMS "Feedpoint"

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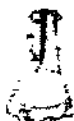
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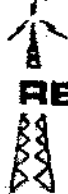
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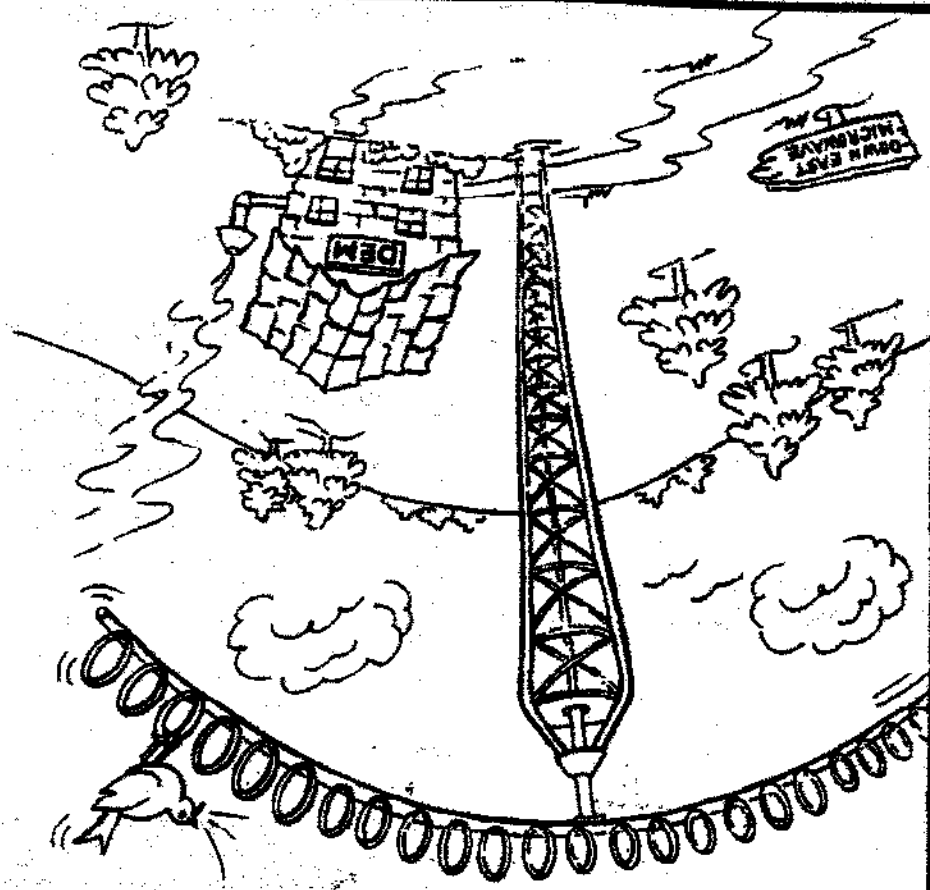
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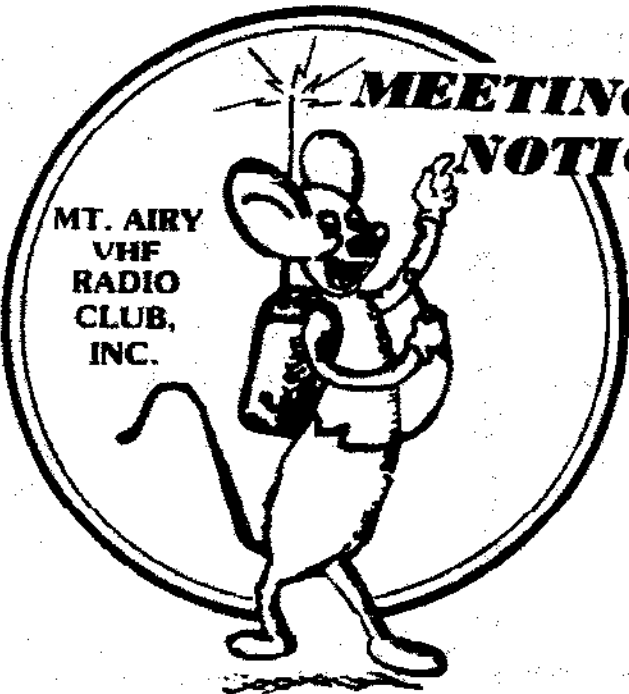
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