

PACK RATS'



PACK RATS

CLUB CALL: W3CCX

MT. AIRY VHF RADIO CLUB, INC.

# CHEESE BITS



MT. AIRY V.H.F. RADIO CLUB, INC., PHILA., PA.  
(50.2, 145.2, 221.4, 432.3 & 1296.3 MC)

AFFILIATED CLUB: AMERICAN RADIO RELAY LEAGUE

MEETINGS: THIRD WEDNESDAY OF EACH MONTH AT 8:00 P.M.

VOLUME IV

JUNE 1970

NUMBER 6

### OUR PREZ SEZ

About the V.H.F. QSO Party  
June 13 and 14

A weekend to contact as many 50 MC and up stations as possible.

The club participates by setting up in the field (Hilltown, Pa.) xmitters on 50, 144, 220, 432, 1296, 2300 MC. As you can imagine, this is a huge operation requiring great planning and preparation by the QSO Party Chairman and group leaders.

Antennas must be erected for all bands, the best of equipment set up, operating tables and shelter provided, transportation of the equipment, food, spares, sleeping cots, tools and a host of miscellany.

This all sounds like a lot of work. It is! So what's in it?

The possibility of working V.H.F. DX from an excellent location. A chance to see how the other guy sets up and operates a station. A chance to see the operation on bands you may not be on. How to set up an emergency portable station. A chance to observe the operation of gear you may not have. There are many other pluses, but best of all is the fellowship of mixing with a gung-ho bunch of club members in a common effort.

All hands are needed to help, especially Friday and Sunday evenings. Will you be there? If not, by all means work W3CCX/3 on as many bands as you can.

W3KKN, Ernie Kenas

P.S. Ghost Writers Hurry! Not much time left!

DEADLINE FOR ARTICLES IS THE GENERAL MEMBERSHIP MEETING.

EDITOR:

K3JJZ, ELLIOTT WEISMAN  
8533 ALGON AVENUE  
PHILADELPHIA, PA. 19152  
215 - PI 2-3525

TRUSTEE OF CLUB CALL: W3CCX

W3SAO, FRANCIS BRICK  
821 W. LINDLEY AVENUE  
PHILADELPHIA, PA. 19141  
215 - DA 4-7524

PUBLISHER AND SUBSCRIPTION MANAGER:

K3GAS, DOC CUTLER  
7815 NEW SECOND STREET  
PHILADELPHIA, PA. 19117  
215 - ME 5-1078

PRINTER:

WA2KOI, LLOYD SCHOENIG  
207 WOODLAWN AVENUE  
COLLINGS LAKE, N. J. 08094

AWARDS CHAIRMAN:

W3EIF, JOSEPH KILGORE  
#5 SUNNYBROOK COURT  
STRATFORD, N. J. 08084

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

MONDAY NIGHT NETS:

145.2 - 7:30 P.M.  
50.2 - 8:30 P.M.  
221.4 - 9:30 P.M.  
432.3 - 10:00 P.M.

OFFICERS - 1969-1970:

PRESIDENT: W3KKN, ERNIE KENAS  
VICE-PRES.: K3JJZ, ELLIOTT WEISMAN  
CORRES. SEC.: W3SAO, FRANCIS BRICK  
REC. SEC.: WA2KOI, LLOYD SCHOENIG

DIRECTORS:

K3HSS, CHARLES LUSTICK  
K3KTY, JOHN TATE  
W3CJU, DONALD HAMPTON  
W3CXU, JOHN ALLEN  
K3MXM, LEE COHEN  
K3CIV, RALPH HERSH  
(Ex-Officio)

PACK RATS' CHEESE BITS is a publication of the Mt. Airy V.H.F. Radio Club, Inc., Philadelphia, Pa., and is published monthly.

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ARRL BULLETINS

NR 271, May 2, 1970

The ARRL Board of Directors in annual meeting May 1 - 2 directed the filing of strong opposition to restrictive FCC proposals on V.H.F. repeaters. League will request rules permitting maximum privileges such as chain linking, code access optional rather than mandatory, crossband operation permitted, elimination of restrictive subbands. Highlights of the meeting will appear in June QST and full minutes in the July issue AR

NR 272, May 14, 1970

A group of amateur stations at various colleges calling itself the student informational network is operating on 75, 40 and 20 meter voice. Some stations in the network have said that their activity is with the approval of ARRL and FCC. This statement is totally false, repeat false. As indicated in the February 1969 QST editorial the league deplors the use of amateur radio for this kind of activity. At the same time, the league points out that the malicious interference which has occurred as a reaction to the student activities is patently illegal and equally undesirable. Nevertheless, the questions raised are purely regulatory, and thus the matter is entirely within the jurisdiction of FCC, which is monitoring the activity AR

JUNE CALENDAR OF EVENTS  
K3MXM, Lee Cohen

MAY  
24 June QSO Party planning and scheming at W3CXU, John Allen's QTH

JUNE  
7 HAMFEST, Casebeer Church Grove, Somerset, Pa.

7 HAMFEST, Penn Central, Winfield, Pa.

6-7 HAMFEST, Penna. Area, Franklin Institute, Philadelphia, Pa.  
Contact W3IRS

10 Board of Directors, QTH K3GAS, 8 p.m.

13-14 June QSO Party, Hilltown, Pa. - all kinds of help needed  
Contact W3CXU, John Allen

17 June Meeting, WOLJCC - elections, special events - visitors  
and friends always welcome

AUGUST  
9 PACK RAT PICNIC, Fort Washington Park, Flourtown, Pa.  
Check your picnic equipment NOW - W3ZD Chairman

11 months to go - 15th Anniversary Dinner - Buck Hotel - 1971

\* \* \* \* \*

432 AND UP

Activity and conditions of the UHF bands have been improving with the spring season. The club net on Monday evening at 22:00 serves as a focal point of interest on the 432 band. Regular call-ins to the net range from Connecticut (K1PXE) and Massachusetts (W1HCU) to Delaware (WA3BAO). Also heard and worked frequently on 432 are K4SUM, Joe, in Virginia and K3EAV/1 in Rhode Island who is back from his maritime trip.

The 432 converter club project conducted by K3UJD, Mario Fontana, has been very successful. Several new stations are now listening with their new converters, and many existing stations have improved their hearing ability due to Mario's efforts.

On 1296, W2JNG is worked regularly in N.N.J. by ye author and Lou, WB2IOE. Also worked by me in the last few weeks are WA2VTR and W2JBZ in Spring Valley, New York. Also had a one way contact with K4SUM (I heard him, but converter problems at his end limited it to one way). Both stations have only 5 watts out!

K2UYH now conducts a net on 432 on Sunday morning at 10:00. The first half hour is on phone. Then they switch to video. All are invited to call in.

So join the fun and get on 432 and/or 1296.

FROM THE BOOK RACK  
Paul R. Behrmann, K3WEU/AREA\*

DID YOU KNOW THAT DURING THE DEPRESSION:

Labor Unions speculated almost as wildly as banks.  
 A fifteen cent bid was made for a 32 story skyscraper in Minneapolis.  
 True Story magazine urged people to buy luxuries on credit.  
 The author Harold Robbins made over a million dollars flying food from the South to New York City.  
 Gangster Al Capone ran his own private breadline in Chicago.  
 A Pittsburgh father stole bread for his children and then hanged himself in shame.  
 One married couple lived for nearly a year in a cave in Central Park.  
 Loan sharks charged Chicago's payless teachers 42 percent interest.  
 More than 100,000 Americans applied for jobs in Russia.  
 Henry Ford called the Depression "a wholesome thing in general".  
 Some unemployed men, displaced as the head of the household, became sexually impotent.  
 800,000 marriages were postponed.  
 Some prostitutes offered to sell their bodies for ten cents.  
 A Texas Congressman believed the way to cure the depression was to deport all aliens.  
 The president of a textile firm said his workers should be able to live on six cents a day.  
 John Steinbeck's teeth rotted because he could not afford a dentist.  
 A girl who made aprons was paid twenty cents a day.  
 Two Maine fishermen earned less than two cents an hour for a day's work.  
 Strikers were thrown into barbed-wire concentration camps in Georgia.  
 Eric Sevareid bummed around the country on freight trains.  
 F.D.R. called Douglas MacArthur one of the two most dangerous men in the country.  
 Parched field mice crept into country schools to drink from ink bottles.  
 A wagon load of oats would not pay for a pair of shoes.  
 A Pennsylvania man suffocated his three small daughters rather than see them starve.  
 In Georgia, a blind negro refused all relief, harnessed himself to a plow like a mule and tilled the fields.  
 With starving men on the same block, a rich man spent \$250,000 on a debutante party for his step-daughter.  
 Striking migrant workers were tarred and feathered in California.  
 Richard M. Nixon accepted federal funds to get through college.

The above facts have been culled from A NATION IN TORMENT: The Great American Depression, 1929-1939 by Edward Robb Ellis, publisher Coward-McCann, Inc.

\* Amateur Radio Editors Association

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220 ACTIVITY

The club intercom frequency of 221.4 MC continues to be the spot for nightly QSOs and questions and answers. Our Monday night net garners about 15 stations. Why not plan on getting on this band. I will be glad to help you.

LADIES NIGHT

The 14th Annual Ladies Night was held at the Buck Hotel May 2, 1970. We had 64 delightful and delighted people present. The roast beef dinner started off what was considered by all to be our best affair yet. Our thanks to Stan Smith, K3IPM, for the many excellent door prizes. Ernie (W3KKN) and Bert (W3TNP) and his XYL really deserve a big vote of appreciation, as they individually chose and wrapped gifts for all the ladies present.

George VanDyke, W3HK, was his usual witty self (he is half way there) as master of ceremonies and his unique way of introducing the XYLs and YLs could not be topped.

Personally, I have never worked on an affair in which so many contributed to its success. We are already working for next year's great 15th Anniversary Dinner. Any comments or suggestions would be appreciated.

And now I am off to play with my slinky toy! (Do you think Ernie had an ulterior motive here?)

K3KTY, John Tate

\* \* \* \* \*

2 METER REPORT  
APRIL 1970

The 2 meter net activity dropped slightly with the advent of DST, which is as can be expected. We can't blame anyone for wanting to get outside after a long winter and get the gardening, lawn mowing and other outside work under way. The net is still averaging about 18 sign-ins, which is good. Conditions up and down the coast have been fair. Held a net at 144.11 recently with W1JSM, New Hampshire; W1JTU, Connecticut; K2RTH, New York; K2AZL, New Jersey; and myself W2EIF, South New Jersey. There has been no aurora openings of note during this period. I am still maintaining the nightly schedule with W8DGF in Cleveland, Ohio. This schedule has been going on since January, every night at 9 p.m. at 144.11 MHz. So far we have failed to communicate only once, and even so there is always evidence to know that the signal is there even when not understandable. Once in a while VE3CWT in Toronto and K2CEH in Buffalo get in on the act.

W2EIF, Jo Kilgore

\* \* \* \* \*

MEMBERSHIP

Applied for Membership

K3OPC, John A. Carson  
8715 Old Line Road  
Philadelphia, Pa.  
IV 2-7170

WA3IDQ, Walt S. Kenworthy  
119 Davis Street  
Philadelphia, Pa.  
IV 3-4966

Telephone Change: K3ZSG - 215 - 272-5527

Dropped from Membership

K3MSV, Jules Bernoff, Philadelphia, Pa.  
K3GAY, Don Lalier, Allentown, Pa.

WA3EHD, Jim Antonacci, Roslyn, Pa.  
K3JJO, Wally Newell, Willow Grove, Pa.

MATCHING DEVICES  
W2EIF, Jo Kilgore

Matching devices for VHF/UHF antenna systems are usually employed at the antenna end of the transmission line because the transmitter is usually designed with a pi network tank circuit to feed 50 ohm loads (standard 52 ohm coaxial cables).

The discussion here will deal with matching devices to be used at the antenna end of the feed line. These matching devices are usually some combination of 1/4 wave length and 1/2 wave length line sections.

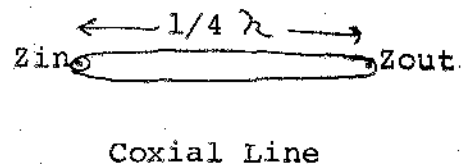
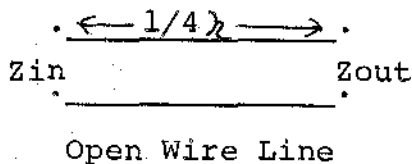
The first device discussed is the 1/4 $\lambda$  transformer. This unique device has the ability of being able to match any impedance by varying the impedance of the 1/4 wave length section.

The formula for the 1/4 $\lambda$  transformer is:

$$Z_0 = \sqrt{Z_{in} \times Z_{out}} \quad (1)$$

where  $Z_0$  = characteristic line impedance  
 $Z_{in}$  = input impedance  
 $Z_{out}$  = output impedance

The 1/4 $\lambda$  section will look like this:



The actual length of the section has to be modified by the velocity factor  $V$  which for open wire lines is 0.975% and for polyethylene coaxial 0.57%.

How do we use this? Here is an example. Suppose I have a 300 ohm balanced impedance which I shall call  $Z_{in}$ , and I want to transform the 300  $\Omega$  to 1200  $\Omega$  balanced. Using the formula (1) above I calculate  $Z_0$  from:

$$Z_0 = \sqrt{300 \times 1200} = \sqrt{360000} = 600$$

This means that if I connect a 600 ohm open wire line section, 1/4 wave length long to the 300 ohm load, the load looking into the open end of the 1/4  $\lambda$  section will be 1200 ohms.

The length of the open wire 1/4 wave length section can be calculated from the formula:

$$\frac{2950}{f \text{ MHz}} \times V \text{ inches} \quad (2)$$

For example, if I am concerned with 50.5 MHz and using open wire line, substituting in the formula (2) above gives:

$$\frac{2950}{50.5} \times .975 = 57 \text{ inches}$$

NOMINATIONS FOR OFFICERS 1970-1971

PRESIDENT: K3JJZ, Elliott Weisman  
 VICE-PRESIDENT: W3CXU, John Allen  
 TREASURER: K3GAS, Doc Cutler  
 RECORDING SECRETARY: WA3BIV, Carl Barish  
 CORRESPONDING SECRETARY: W3SAO, Frank Brick  
 DIRECTORS: K3ZPN, Lloyd Schoenig  
 WA3LNH, Chuck Benavides  
 K3UJD, Mario Fontana  
 K3EPB, Howard Fretz  
 K3EOD, Allan Boblitt  
 K3OBY, Jim Bowman

Election is June 17. Nominations from the floor will be taken up to and including election night.

Nominating Committee  
 K3IUUV, Bert Soltoff  
 W3HKZ, Ed Kushner

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MATCHING DEVICES (Continued)

If I use coax cable the length is:

$$\frac{2950}{50.5} \times .67 = 39.25 \text{ inches}$$

However, this line section would not be used with the same impedance (300Ω) as the open wire section. The coaxial 1/4λ section could be used as follows:

Suppose I have a 52Ω load and want to make it look like 100 ohms, using formula (1) -

$$Z_0 = \sqrt{Z_{in} \times Z_{out}} = \sqrt{52 \times 100} = \sqrt{5200} = 72 \text{ ohms}$$

Fortunately, RG 11/4 fits the bill. So if I connect 39.25 inches of RG 11/4 cable to my 52Ω 6 meter beam, the impedance looking into the open end of the cable is 100 ohms. This is an extremely useful tool when stacking beams.

TO BE CONTINUED NEXT MONTH

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DOES YOUR WIFE LIKE TO BE CALLED A BLOCKHEAD?

That term, XYL, so dearly loved by assorted lids, must have some basis for having crept into radioese. Research has turned up a clue. Encyclopedia of English, edited by Arthur Zeigler, lists some of the root-words of our language. Near the tail-end of the list is xyl, from the Greek xyle, meaning wood. Maybe, it's better for your wife to believe you're calling her a blockhead than an ex-young lady. No woman delights in being told she's no longer young and no longer a lady!

Conducted By: W3ZRR, Ray Whitehead  
7329 Shelborne St.  
Phila., Pa. 19111  
215 - RA 2-4786

The next DIRECTORS' MEETING will be held on Wednesday, June 10, at the QTH of K3GAS, Doc Cutler, 7815 New Second Street, Elkins Park, Pa. (635-1078).

FOR SALE

- Model TR4 transceiver with MS4 speaker and Turner 454C microphone. New condition. \$550  
Pick up only.  
CONTACT: K3FYS, Mollie Silverstein  
132 E. Colonial Street  
Philadelphia, Pa. 19120

The next REGULAR MEETING will be held on Wednesday, June 17, at the West Oak Lane Jewish Community Center, Sedgewick and Thouron Streets at 8 p.m. TOPIC: Election of officers and to be announced.

\* \* \* \* \*

FOR SALE

- Johnson Ranger Viking II  
- Johnson Electronic TR Switch  
- TX 62 and matching VFO  
- Ameco 2M conv, preamp, and power supply Best Offer  
CONTACT: WA3CND, Howard Candy  
4013 Benson Street  
Philadelphia, Pa. 19136  
MA 4-6812

VISITORS AT THE MAY MEETING

WA3NVO, Paul, Kensington, Pa.  
WA3KPP, John, Foxchase, Pa.  
WA2MMS/3, Ron, North Phila., Pa.  
W3UXF, Joe, Doylestown, Pa.  
WA3AXV, Ron, Churchville, Pa.  
WA3MRP, Ed, Philadelphia, Pa.  
WA3IDQ, Walt, Roxboro, Pa.  
K30PC, John, Roxboro, Pa.  
W3CTT, Carl, Mt. Airy, Pa.

\* \* \* \* \*

FOR SALE:

Estate of W3MVF  
- Ameco TX62 with D104 mike  
Nuvistor converter with power supply  
ARC 5 VFO with power supply  
Dowkey relay \$140  
- SX43 with speaker 45  
- 6M homebrew xmtr and modulator built in power supply  
6M homebrew converter with power supply  
6M ARC 5 VFO  
Turner T2 mike 75  
- 6M SSB exciter home brew with power supply  
Pair 6146 linear amplifier  
Homebrew VFO with power supply 65  
- Power supply with 5 position transfer 5  
- Venus 6M SSB transceiver  
Apollo linear amplifier  
Clegg SSB booster  
Turner SSB mike 425  
CONTACT: K3GAS, Doc Cutler  
7815 New Second Street  
Philadelphia, Pa. 19117  
215 - 635-1078

DID YOU KNOW

K3GAS, Doc Cutler, has a big file of schematics for older TVs, auto radios, receivers, phonos, etc. By the time CHEESE BITS goes to press we will have welcomed home K3MXM, Lee Cohen, from Albert Einstein Medical Center. August 9 is the date for the Pack Rat picnic. Don't miss this one!

\* \* \* \* \*

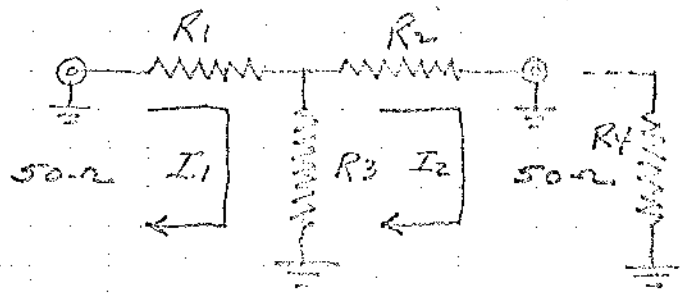
COURTING RULES FOR AMATEURS

If she wants a date - METER  
If she's too fat - CONDENSER  
If she's hungry - FEEDER  
If she's an angel - TRANSFORMER  
If she's cold - INSULATOR  
If she's bored - EXCITER  
If she wants to marry - RESISTOR  
If she's a devil - CONVERTER  
If you have two girls - ALTERNATOR  
If she's tired - TAKE HER OHM.



# POWER DIVIDERS OR ATTENUATORS

## "T" ATTENUATOR



ATTEN. IN D.B.	RESISTOR VALUES - OHMS R1 - R2	R3
3.0	8.55	141.9
6.0	16.61	66.9
10.0	25.97	35.14
14.0	33.37	20.78
20.0	40.91	10.1

USE NEAREST VALUE

POWER RATING OF R1, R2 AND R3 CAN BE MADE UP BY SERIESING AND PARALLELING RESISTORS TO MAKE THE RESISTOR VALUE AND POWER RATING. FROM EXAM. AT RIGHT, R1 = 52 W, R2 = 5 W, R3 = 33 W. FOR SSB SERVICE 50% OF THESE RATINGS IS SATISFACTORY -

EXAMPLE -  
 R1 = 25 W = 26 Ω  
 2 - 75 Ω 2 W IN SERIES  
 5 OF ABOVE IN PARALLEL  
 PLUS 2 - 100 Ω 2 W IN SERIES  
 THEN IN PARALLEL WITH ABOVE

$\frac{75\Omega}{\text{|||||}} \quad \frac{75\Omega}{\text{|||||}} = 150\Omega$   
 $\frac{100\Omega}{\text{|||||}} \quad \frac{100\Omega}{\text{|||||}} = 200\Omega$

5 PARALLELED = 30 Ω  
 200 Ω PARALLELED WITH 30 Ω  
26.2 Ω

SAME PROCEDURE FOR R2 & R3

### POWER RATING OF RESISTORS

ASSUME 100 WATT FROM EXCITER  
 LINEAR REQUIRES 10 WATTS  
 ATTENUATION REQUIRED 10 DB  
 RATIO 10:1

$$P = EI \text{ OR } P = \frac{E^2}{R} \text{ OR } P = I^2 R$$

POWER RATING OF R2 - DETERMINE I2 - KNOWING R4 = 50 Ω & PWR RATING = 10 WATTS. THEN

$$I_2 = \sqrt{\frac{P}{R}} = \sqrt{\frac{10}{50}} = .447 \text{ AMPS.}$$

$$\therefore P_{R2} = (I_2)^2 \times R_2 = .447^2 \times 26 = \underline{5.2 W}$$

POWER RATING OF R3 - DETERMINE VOLTAGE DROP ACROSS R3

$$E = I_2 \times (R_2 + R_4) = .447 \times 76 = \underline{33.97 V}$$

$$I_{R3} = \frac{E R_3}{R R_3} = \frac{33.97}{35} = \underline{.971 \text{ AMPS}}$$

$$\therefore P_{R3} = (.971)^2 \times 35 = \underline{33.01 \text{ WATTS}}$$

POWER RATING OF R1 -

$$I_1 + I_2 = .447 + .971 = 1.418 \text{ AMP.}$$

$$\therefore P_{R1} = (1.418)^2 \times 26 = \underline{52.28 W}$$

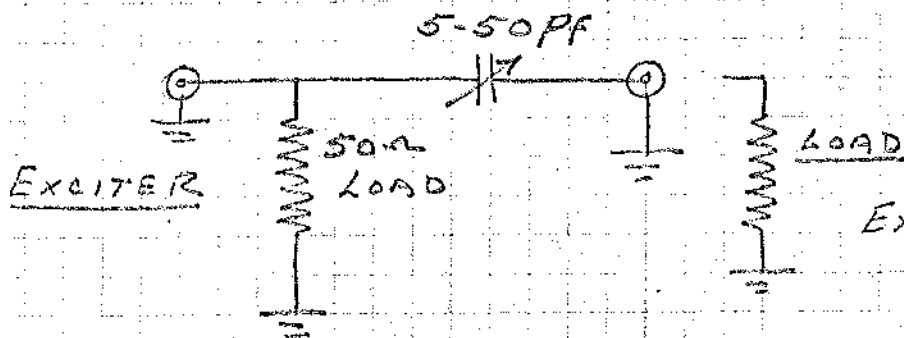
RESISTORS SHOULD DISSIPATE 90 WATTS - 100 W - 10 W - ADD POWER RATING R1, R2 & R3

$$52.28 W + 5.2 + 33.01 = \underline{90.49 W}$$

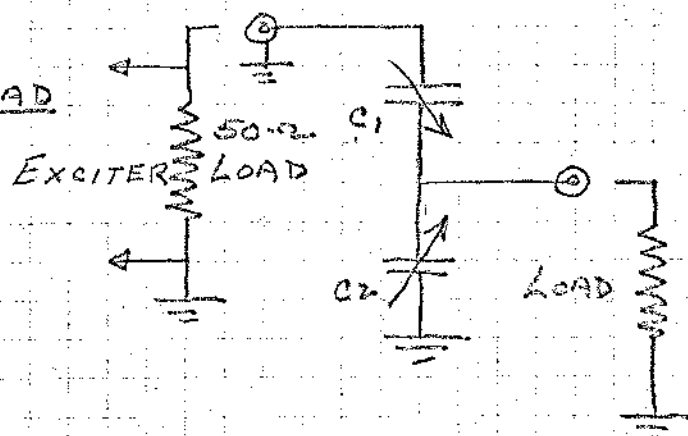
THESE ATTENUATORS CAN BE ENCLOSED IN A MINI-BOX OF SUITABLE SIZE, ALLOW VENTILATION.

John B. Powers  
3/7/90 W2AXU

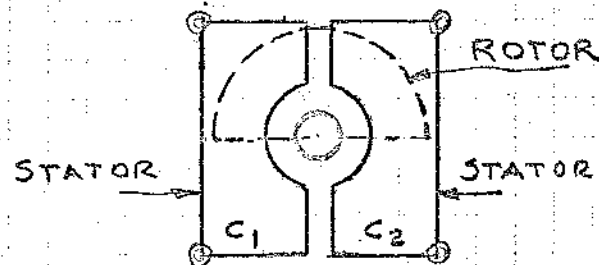
# POWER DIVIDERS OR ATTENUATORS - CONTINUED



THIS TYPE ATTENUATOR IS SUITABLE FOR HIGH POWER AND LOW POWER. THE POWER FROM THE EXCITER WILL DETERMINE THE 50 OHM LOAD POWER RATING. FOR POWERS OF 10-20 WATTS THE 50 OHM LOAD CAN BE MADE OF PARALLELED 2 WATT RESISTORS HEAT SINKED. FOR HIGHER POWERS, A HEATHKIT ANTENNA WOULD BE SUITABLE. THE REACTANCE OF THE CAPACITOR VALUE WILL DETERMINE THE RF VOLTAGE APPLIED TO THE LOAD. THIS WILL VARY WITH FREQUENCY - ONE VALUE FOR 50 MHz AND A LESSER VALUE FOR 144 MHz ETC. THE CAPACITOR VOLTAGE RATING WILL DEPEND UPON THE POWER TO BE DELIVERED. IN MOST CASES, A CERAMIC TRIMMER WILL SUFFICE. AIR SPACED VARIABLES WILL HANDLE VOLTAGES UP TO SEVERAL THOUSANDS OF VOLTS, BUT REMEMBER ITS PEAK VOLTS.



THE ABOVE IS A CAPACITIVE DIVIDER. THE CAPACITOR USED IS A DIFFERENTIAL CAPACITOR - ONE HAVING TWO STATORS AND A COMMON ROTOR. THUS:-



THE RF VOLTAGE DIVISION DEPENDS UPON THE REACTANCE OF EACH SECTION OF THE CAPACITOR. THE VALUE OF THE CAPACITANCE FOR RF VOLTAGE DIVISION DEPENDS UPON THE FREQUENCY. THE ATTENUATOR BEING VARIABLE, THE RF VOLTAGE TO THE LOAD CAN BE ADJUSTED TO ANY VALUE. A LARGE VALUE AT C1 AND A SMALL VALUE AT C2, GIVES A LARGER VOLTAGE AT THE LOAD.

John B. Power W2AXU  
3/7/70

NEW PRODUCTS OF INTEREST TO HAMS

- DowKey** - This company has just introduced a series of vacuum relays, the most interesting of which is the model 310 SPDT. This unit can be had with N, BNC, or TNC connections. However, the power rating of 3KW would apply only to the N type fittings. Available with 6, 12 or 100 V DC or 110 Vac coils.

A SP8T remote coaxial relay is also available with BNC or TNC fittings. It can be ordered with the same voltages as the #310.
- Rotron Inc.** - This company now has a line of fans developed for use with their BATAc unit, which allows use of the 110 Vac fan on 12 Vdc. The Sprite 3" fan could be of use to a mobile ham who wants cooling for the rig but wants to avoid the hash from a DC unit. The fan and Batac unit must be ordered as a set, since the Batac will not run the standard Sprite unit.
- Bud Metal Products Division** - A line of cast aluminum boxes have been introduced by Bud to serve the needs of the home constructor for metal boxes that have better shielding and are more rugged than the standard units. The CU 124, 234, 247, and 347 are \$1.40, \$2.30, \$3.70, and \$4.00. These should be just the thing for TVI filters, converters, or dummy loads.

73  
W3NSI, Lyn Rowland

<p><b>morton d. mazer</b> WA3EP5 REAL ESTATE 1609 E. WADSWORTH AVENUE PHILADELPHIA, PENNA. 19102</p>	<p>MECHANICAL ELECTRONIC DEVICES BUD 4046 REPERFORATOR 8014 W/AUTOMATIC WINDER \$55 RECEIVER LOG TX-27 400-510712..... \$30 TRANSMITTER TDS-1 1/2/MODULATOR..... \$30 COMPUTER TAPE TRANSPORT W/B CHAR. HEAD \$20 4000: SILICON RECTIFIER 1 AMP..... \$3.95 SILICON BRIDGE UP TO 500:1 AMP. 3/4 \$3 CARBON LINE 1/PUSH TO TALK SWITCH..... \$1 PANEL METERS 3/19 MULTIMETERS \$3.50 &amp; \$4.15 TRANSFORMER FILAMENT 12V-5A..... 2/15 TEST EQUIP. POWER SUPPLIES, WIRE 1/20FT FERTIK'S ELECTRONICS STROTHOGA BAT 9-577</p>	<p>K3AKM LEF A. COHEN CLAYTON L. HANBY &amp; SON 4227-77 HEDGE CREEK PHILADELPHIA, PA. 19124</p>
<p>LOcust 7-7130 TRANSPORT EQUIPMENT COMPANY "Everything for the Truck" JOHN A. TATE HOME PHONE OR 9-8840 22 S 2217 RACE STREET PHILADELPHIA, PA. 19103</p>	<p>FLORIAN G 2425 - 87 G &amp; G Metal Products STEEL FABRICATION - FORMING AND STAMPING SPOT WELDING - ARC WELDING 1708-18 GILLINGHAM STREET PHILADELPHIA 24, PA.</p>	<p>DEF. SCHAFFEL W3ATE MASS ELECTRONICS DISTRIBUTORS DISTRIBUTORS OF INDUSTRIAL ELECTRONIC PARTS &amp; EQUIPMENT TELEVISION PRODUCTS 2502 TOWNSHIP LINE ROAD WEST OF LANSDOWNE AVE GREXEL HILL, PA. 19026</p>
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