

# W4CA LOG



*Amateur Radio News in  
The Roanoke Valley*

W4CA LOG  
P.O. Box 2002  
ROANOKE, VA.



FIRST CLASS MAIL  
Address Correction  
Requested

Van Wimmer  
Route 4, Box 428 F  
Salem, Va. 24153



CLUB ACTIVITIES - - - - By Richard Genter K4BKX

NOTICE - - NO SECOND MEETING IN DECEMBER !!!!

Dec. 12 - - - - - Quiz on Lesson 1

- - - - - Lesson 2 "Magnetism"

AMECO - Amateur Radio Theory Course  
Instructor: Bob Anderson K4UMK

NOTICE -- Since the first two lessons are relatively easy it is not too late to take part in this course. Only a radio appetizer has been served, and the "meat" is yet to come --- Sooo you bring your friends and join the fun.

\* \* \* \* \*

NOTICE -- By membership agreement last regular meeting, it was decided that our 1970 Ham Fest will be a Virginia State ARRL Convention. Further details will be announced later.

\* \* \* \* \*

WANTED

To Buy - - - - - Antenna Rotator, Ham "M" or equal

To Sell - - - - - EICO CW Transmitter (90W) \$50.00

WA4BIX 389-2806

\* \* \* \* \*

To Buy - - - - - One piece of aluminum 12" x 12" x 1/4" - no holes, round or square.

WA4KSR P.C.Sharr 389-5506

W4CA LOG

DECEMBER 1969

CLUB HOUSE - 110 Union Street, Salem, Va. 24153

CLUB MEETINGS: Second and Fourth Friday each month  
TIME: 8:00 P.M. (unless otherwise stated.)

PRESIDENT - - - - - Van A. Wimmer - WA4BIX, R.F.D. 4, Box 428F,  
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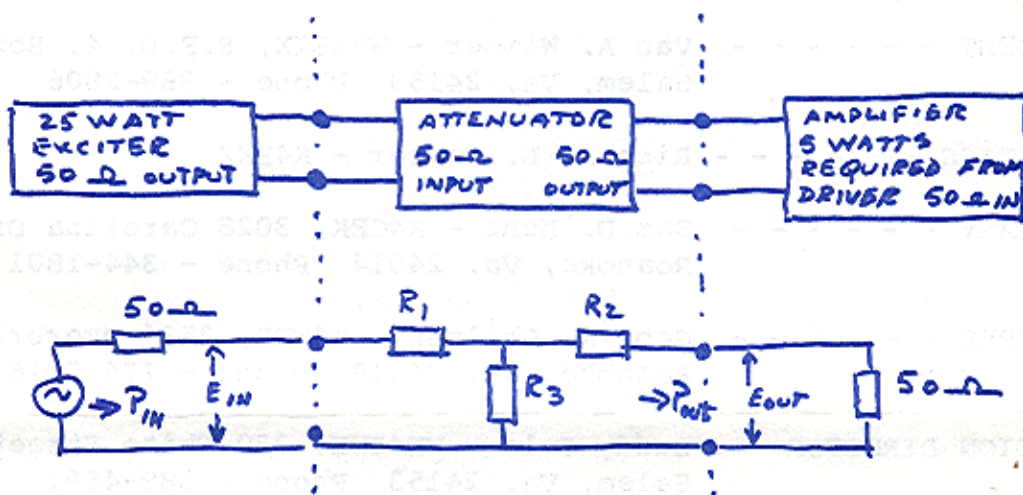
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## TECHNICAL I

FROM TIME TO TIME HAMS WITH LINEAR AMPLIFIERS ARE FACED WITH THE PROBLEM OF TOO MUCH EXCITATION COMING FROM THE EXCITER, AND THEREBY OVERDRIVING THE FINAL. AN ACCEPTABLE SOLUTION FOR THIS PROBLEM IS AN ATTENUATOR INSERTION BETWEEN THE EXCITER AND LINEAR. THIS ATTENUATOR MUST NOT UPSET THE USUAL OPERATING PARAMETERS OF EITHER UNIT. THE FOLLOWING EXAMPLE WILL SHOW THE PROCEDURE FOR CALCULATING SUCH AN ATTENUATOR:



POWER FROM EXCITER INTO ATTENUATOR =  $P_{IN} = 25$  WATTS

POWER FROM ATTENUATOR INTO FINAL =  $P_{OUT} = 5$  WATTS

AND

$$P_{IN} = \frac{(E_{IN})^2}{R_{IN}}, \quad R_{IN} = 50 \Omega \quad (= 50 \Omega \text{ } R_{OUT} \text{ ALSO})$$

$$25 = \frac{(E_{IN})^2}{50}, \quad (E_{IN})^2 = 25 \times 50 = 1250$$

$$\underline{E_{IN} = 35.4 \text{ VOLTS RMS}}$$

SIMILARLY

$$P_{OUT} = \frac{(E_{OUT})^2}{R_o}$$

$$5 = \frac{(E_{OUT})^2}{50}$$

$$(E_{OUT})^2 = 5 \times 50 = 250$$

$$\underline{E_{OUT} = 15.8 \text{ VOLTS RMS}}$$

THIS MEANS THAT THERE IS 35.4 VOLTS INPUT TO ATTENUATOR AND 15.8 VOLTS OUTPUT. THE RATIO:  $a = \frac{E_{IN}}{E_{OUT}} = \frac{35.4}{15.8} = 2.24$

NOW

THE FORMULA FOR DETERMINING THE RESISTANCE VALUES OF THE ATTENUATOR IS AS FOLLOWS:

$$R_1 = R_2 = R_{OUT} \left( \frac{a+1}{a-1} \right) = 50 \left( \frac{2.24+1}{2.24-1} \right)$$

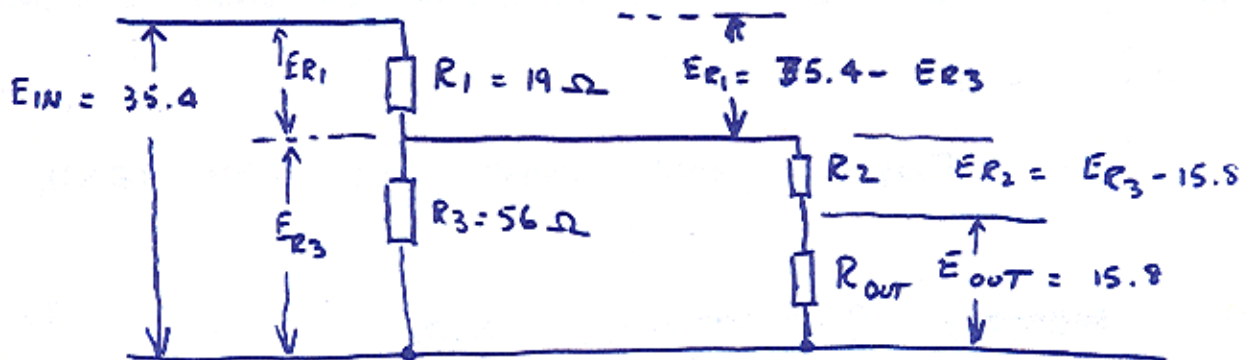
$$R_1 = R_2 = 50 \left( \frac{3.24}{1.24} \right) = 19 \text{ OHMS}$$

AND

$$R_3 = \frac{2 R_0 a}{a^2 - 1} = \frac{2 \times 50 \times 2.24}{5 - 1}$$

$$R_3 = \frac{224}{4} = 56 \text{ OHMS}$$

THE VOLTAGE INSIDE THE ATTENUATOR ARE AS FOLLOWS



$$E_{R3} = E_{IN} \left( \frac{R_{EQ}}{R_1 + R_{EQ}} \right), \quad R_{EQ} = \frac{(R_0 + R_2) R_3}{(R_0 + R_2) + R_3} = 30.9 \Omega$$

$$E_{R3} = 35.4 \left( \frac{30.9}{19 + 30.9} \right) = 22 \text{ VOLTS}$$

$$E_{R1} = 35.4 - 22 = 13.4 \text{ VOLTS}$$

$$E_{R2} = 22 - 15.8 = 6.2 \text{ VOLTS}$$



## POWER DISSIPATION INSIDE ATTENUATOR

$$P_{R_3} = \frac{(E_{R_3})^2}{R_3} = \frac{(22)^2}{56} = 8.7 \text{ WATTS} \quad (\text{LIKE } 10\text{-}56\text{-}\Omega\text{-}2\text{WATT} \text{ RESISTOR IN PARALLEL})$$

$$P_{R_2} = \frac{(E_{R_2})^2}{R_2} = \frac{(6.2)^2}{19} = 2.0 \text{ WATTS}$$

$$P_{R_1} = \frac{(E_{R_1})^2}{R_1} = \frac{(13.4)^2}{19} = 9.0 \text{ WATTS}$$

TOTAL WATTS LOST 19.7 WATTS

THIS IS WITHIN CALCULATION ERROR (OF 20 WATTS) OF THE DESIRED. THESE DISSIPATIONS ARE ACTUAL WATTS AND THE RATINGS OF THE RESISTORS MUST BE AT LEAST TWICE THE VALUES SHOWN. NOTE ALSO THE  $R_2$  SHOULD BE RATED THE SAME AS  $R_1$  EVEN THOUGH  $R_2$  DISSIPATES LESS POWER THIS RATING ALLOWS THE ATTENUATOR TO BE USED IN EITHER DIRECTION.

NOTE THAT THIS ARTICLE IS BASED ON OHMS LAW AS COVERED IN THE PREVIOUS LESSON AT THE RADIO CLUB, AND IS A VERY DIRECT APPLICATION OF THAT LESSON

THIS IS THE LAST LOG THIS YEAR

SO

MERRY CHRISTMAS AND

HAPPY NEW YEAR!

FROM ALL THE CLUB OFFICERS AND  
CLUB PARTICIPANTS

NOTICE

COPY FOR

LOG MUST

BE IN

BY 1st

DR NO LOG





MERRY CHRISTMAS  
AND  
HAPPY NEW YEAR



Handwritten text in the bottom half of the page, including the words "MERRY CHRISTMAS" and "HAPPY NEW YEAR" written in a large, stylized, cursive font. There are also some faint, illegible markings and scribbles.