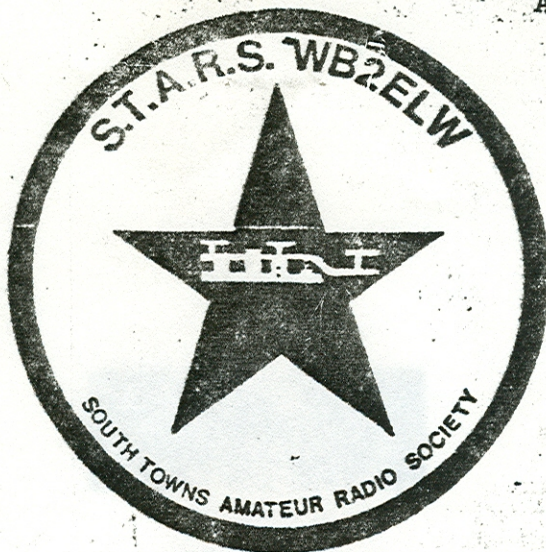


TELSTAR

KB2EQV
STEVE YEKICH
716-825-8049



BUSINESS MEETING = 3rd of August at the Nike Base
Board Meeting = ? of August

NOTE: The Nike Base is open every monday night from 7pm till 9pm. We just got the 3el up and are back to business thanks to all that helped especialy Bob WA2IQX who climbed the tower, so come on down and have a ball!!!!!!

The Season Of Thunder and Lightning

People may not realize it, but they already have a reliable warning system in their home. Television sets and portable radios make excelent tornado detection devices, according to the Perth 4 H news letter. If a radio is tuned to 550 khz. lightning will cause intermitent static. A tornado will cause continous static.

To use a television set as a tornado detector, warm up the set, and tune it to channel 13, turn the volume down, and turn the brightness control down until the screen is almost black. switch over to channel 2 and leave the volume turned down. Lightning will produce momentary light bands of varying widths across the screen of a black and white T.V. set. Colored bands will appear across the screen of a color set.

A tornado that is within 15 to 20 miles will produce a totally white screen and will produce a single color in the case of a color set. Should this occur, switch off the set, take a portable radio and immediately seek shelter.

How does the T.V. detection system work ?

Channel 2 has a frequency of 55 MHZ. Lightning and tornados generate a signal near this frequency which overrides the brightness control. Channel 13 is at the high end of the VHF band and is therefore not affected. That is why the darkness must be set on channel 13 !!!!

The next time a serious storm threatens your area, try this trick. It just might save your life.



VE REPORT

by Dick Haungs W2UJR

STARS will hold a VE test session on October 11, 1989 at the Hamburg Junior High School in rooms 117/119, 360 Division street Hamburg N.Y. 7:00-10:00pm.

Technician thru Extra exams will be given. Please send your 610 applications, a copy of your license and a check for \$4.75 made out to ARRL/VEC.

TO:

MATT GORSKI NS2M
6117 Broadway
Lancaster, N.Y. 14086

Please indicate what test elements you want to take. There will be NO WALKINS and the registration deadline is October 4th.

The Lancaster Amateur Radio Club will hold a test session on August 16, for details call MATT GORSKI NS2M 683-1720

Dick Haungs W2UJR
VE Liaison



STARS GOSSIP COLUMN

Guz - WB2EZX

How many of you that take the QST or other Ham magazines never look at the Special event station articles in the magazine? At any given month there are at least twenty to fifty special event stations listed. It is a challenge to work some of them and as a rule for S.A.S.E you get a very colorful card or certificate for your effort. As an example the July issue had a horse drawn covered wagon train from South Dakota, the naval air station with NASA from CA., the undersea Naval station in the state of Washington, the river boat days from Iowa, an air show from Fulton N.Y., the Kennedy Space center in FLORIDA Etc,Etc. These are easy stations to work and the beautiful cards they send are worth the effort.

If you are interested in upgrading your present ticket please take advantage of our VE test in October, it will be in your favor as in 1990 the ARRL is making arrangements to change most of the questions on the tests to favor the new state of the art. Have you checked your expiration date on your ticket lately?

Boy the clubs two meter repeater sure is getting a good work out lately for summer. What with contacts from VE3 land and also some marine mobile contacts from some fisherman out on their crafts, plus a few contacts with some of the amusement parks in the vicinity. It is performing very well.

At the Batavia Hamfest there was a QRP rig set up and running on solar power. It was quite impressive and the sun shown brightly making it easy to have contacts. Does any club member wish to work with Solar Power??? The Nike base has had some activity and the equipment is getting upgraded. Anxious to see how the beam will work now.

Hope to see you all Aug. 3rd
Guz WB2EZX

mance of simple dipoles for 160 through 40 meters. In addition, I_3 alone does not cause TVI, but radiation from external feed-line current can cause severe distortion in the radiation patterns of directive antennas, such as Yagis and quads. Unless a gamma match or other type of unbalanced input-matching scheme is used, all beam antennas with balanced input terminals require a balun if the optimum performance of the antenna system is to be achieved when fed with coaxial cable. For example, when a balun is not employed, the feed line and tower together become a separate, nondirectional antenna. This produces unwanted vertically polarized radiation that fills in the rearward null in the beam pattern, destroying the front-to-back ratio. The tower radiates along with the feed line, because currents are induced through coupling between the feedline and the tower.

The Choke Balun

Although many baluns embody some form of coupling transformer, an alternative is to insert an rf choke in the outer conductor of the feed line. This presents a high impedance to I_3 without affecting the internal currents. Advantages of this method are the lack of limitations on either maximum SWR or power handling. In addition, there is no impedance-transfer error that plagues transformer types of baluns (causing a skewing of SWR and impedance plots), because the choke balun has no coupling transformer — the feed line goes straight through to the antenna terminals!

The simplest choke balun is formed by coiling up a few turns of the feed line, starting where it connects to the antenna terminals. In the frequency range of 14 to 30 MHz, several turns of feed line coiled in an 8-inch diameter form an inductor with enough series reactance to minimize I_3 and practically eliminate feed-line radiation. Unfortunately, this form of choke (with an air core) is not practical below 14 MHz, because too much coiled-up feed line would be required to reduce I_3 to an acceptable level.

A word of caution is in order when the choke balun is used on tower-mounted antennas: The choke coil should be placed directly at the feed terminals of the driven element. If the coil is placed away from the feed terminals, any portion of feed line between the terminals and the coil is coupled to the boom or mast, which in turn is coupled to one arm of the driven element. The result — imbalance of currents in the driven-element, pattern skewing and tower radiation.

The frequency range of the choke balun can be extended to well below 2.0 MHz by using a core of high-permeability ferrite instead of air. With higher core permeability, the choke inductance increases dramatically, thereby retaining the high reactance needed to minimize I_3 at the lower frequencies. Of great impor-

tance, no core saturation occurs at high-power levels in the choke balun (a serious problem in transformer-type baluns), because the core excitation is low level, produced only by I_3 and not by the high internal current that feeds the antenna.

At my suggestion, Reiser made his choke balun with a Q1 material ($\mu = 125$ to 400) ferrite toroid, winding 9 turns of RG-141/U coaxial cable on the core for use from 14 to 30 MHz.⁹ However, his 12-turn balun appears to provide marginal performance at 4 MHz. The problem stems from the toroidal winding arrangement. It is difficult to get a tight wrap of coaxial cable around the toroid, resulting in a coupling loss that makes it impossible to utilize the full value of the core permeability.

Balun Construction Using Ferrite Beads

I have obtained greatly improved choke-balun performance by placing several ferrite beads or sleeves of even higher permeability around the coaxial feed line.⁶ For readers who wish to build this simple coaxial balun, bead materials of various size and rf characteristics are available that dramatically increase both the reactance and resistance of a conductor. (Adding resistance to the reactance in this circuit improves the operational bandwidth of the balun with no increase in loss.) In general, the impedance of the outer coaxial braid surface increases almost proportionately with the number of beads placed over it. A combination of 50-ohm teflon-dielectric RG-303/U cable (or RG-141/U, with the fabric covering removed) and ferrite beads having an ID of 0.197 in. and a length of 0.190 in., form a superb, compact, wide-band balun.⁷ While the two inner conductors of the coaxial cable remain unaffected, the beads introduce a high impedance in series with the braid outer surface. This configuration effectively isolates the external output terminal of the feed line from that at the input end.

A test balun was made by slipping 300 no. 73 beads ($\mu = 2500$ to 4000) over a piece of RG-303 coaxial cable. The impedance of the outer conductor of the cable measured $4500 + j3800$ ohms at 4.0 MHz; $15.6 + j13.1$ ohms was measured utilizing a single bead. For practical baluns (less than 12 in. long, including connector) used from 1.8 to 30 MHz, use 50 no. 73 beads (Amidon no. FB-73-2401 or Fair-Rite no. 2673002401-0); for 30 to 250 MHz, use 25 no. 43 beads ($\mu = 950$ to 3000, Amidon no. FB-43-2401 or Fair-Rite no. 2643002401). No. 64 beads ($\mu = 250$ to 375) are recommended for use above 200 MHz, but I have not yet experimented with them.⁸ The coaxial cable need only be long enough to hold the beads, and to access the end connectors.

The graphs in Fig. 3 show the measured values of series resistance (R), reactance (X) and impedance (Z) versus frequency of the outer braid surface of a choke

balun, for both the 25- and 50-bead types. With either balun, I_3 will be negligible. Using a balance-measuring technique learned from my RCA antenna-lab colleague, O. M. Woodward, the output terminal imbalance relative to ground of these baluns is undetectable using an HP-410C rf VTVM.⁹

At legal input levels, no power-handling problems will arise using these baluns, because the cw power-handling capability of the cable is 3.5 kW at 50 MHz, and 9 kW at 10 MHz.¹⁰ Any suitable connector that will mate with the load end of your feed line can be used at the input of the balun, and the balanced-output terminals may simply be pigtailed formed by the inner and outer conductors of the feed line. Methods for connecting the output terminals to the antenna are left to the ingenuity of the reader.

To emphasize simplicity, what vhf antenna buff wouldn't delight in dumping his unwieldy, frequency-sensitive, half-wavelength line balun? He can replace it by simply putting some ferrite beads on the last few inches of his coaxial feed line!

Notes

- ¹J. Nagle, "RF Impedance Bridge Measurement Errors and Corrections," *Ham Radio*, May 1979.
- ²G. Hall, ed., *The ARRL Antenna Book*, 14th ed. (Newington: ARRL, 1982), Chapter 5, p. 5.
- ³J. Reiser, "Simple and Efficient Broadband Balun," *Ham Radio*, Sept. 1978, p. 12.
- ⁴W. Orr, "Multiple Dipole for Portable Use," *Ham Radio*, May 1970, p. 14.
- ⁵See note 3.
- ⁶D. DeMaw, *Ferromagnetic Core Design and Application Handbook* (Englewood Cliffs, NJ: Prentice-Hall, Inc., 1981), Chapter 4.
- ⁷mm = in. \times 25.4.
- ⁸Ferrite bead materials are available from Amidon Associates, 12033 Otsego St., N. Hollywood, CA 91607, or Fair-Rite Products Corp., 1 Commercial Row, Walkkill, NY 12589.
- ⁹O. Woodward, Jr., "Balance Measurements on Balun Transformers," *Electronics*, Sept. 1953, p. 188.
- ¹⁰*RF Transmission Line Catalog and Handbook*, No. TL-6 (Wallingford, CT: Times Wire and Cable Co., 1972).

Strays

QEX: THE EXPERIMENTERS' EXCHANGE

Wonder what you've been missing by not subscribing to QEX, the ARRL newsletter for experimenters? Among the features in the February issue were:

- Second ARRL Packet Conference Pre-registration
- "PROM Programmer/Reader and Utility Software for the 2708 and 2716," by G. M. Palmer, K8LG
- "VHF + Technology," by Geoff Krauss, WA2GFP

QEX is edited by Paul Rinaldo, W4RI, and is published monthly. The special subscription rate for ARRL members is \$6 for 12 issues; for nonmembers, \$12. There are additional postage surcharges for mailing outside the U.S.; write Headquarters for details.

CALL	FIRST	LAST	ADDRESS	CITY	ZIP	PHONE	CLASS	KC256	CRUCK	LOUISE	S 4763 CLIFTON PKWY.	HAMBURG	14075	627-7723	E
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K26TK	FRANK	WEINSTOCK	234 MAIN ST.	HAMBURG	14075	648-6669	6	KC256	GUSTAV O.	MEGER	62 ZOLLARS AVE.	BUFFALO	14220	824-4180	T
K26KE	KENNETH	HANS	243 CROSBY BLVD.	BUFFALO	14226	834-4083	6	KC256	SYTHIA J.	BOHMAN	150 SIXTH AVE.	LANCASTER	14086	683-0692	T
K26JUV	DAVID	ROSKER	113 HEMLOCK DR.	WEST SENECA	14224	674-2969	6	KC256	MIKE	POLLUTRI	97 TINDLE AVE.	WEST SENECA	14224	825-3287	6
K26JUM	RALPH	CHANEY JR.	132 N. WILLOW	EAST AURORA	14075	652-4044	E	KC256	GLEN C.	FULLER	76 HILER AVE.	KENMORE	14217	874-3845	A
K26CF1	STEVE	JOHNSTON	3401 B16TREE RD.	HAMBURG	14075		T	KC256	CLINT	SOEMANN	2382 NEW JERUSALEM RD.	EDEN	14057	unlisted	T
K26BIS	JOHN	WATERHOUSE	2095 BLAKELY RD.	EAST AURORA	14052	652-1344	6	KC256	MICHAEL	SELSINGER	71 HENRICKS	EGGERTSVILLE	14226	834-0830	6
K26HJ1	VINCE	ORLOWSKI	102 STANLEY ST.	BUFFALO	14206	892-9041	T	KC256	BILL	SISKA	57 DURONNET DR.	CHEEKTOWAGA	14043	668-6480	T
K26HHC	ROBERT	TESI	178 EDEN ST.	BUFFALO	14220	822-8006	6	KC256	SAMUEL	QUINONES	23 FOHLER ST.	LACKAWANNA	14218	875-0518	6
K26JEX	WILLIAM P.	WACH	31 DARWIN DR.	DEPEN	14063	683-7612	6	KC256	NICK	STANKO	4129 SOWLES RD.	HAMBURG	14075	649-9169	T
K26KCY	DENNIS	CROWELL	7 PARK ST. BOX 11	FORESTVILLE	14062	965-2528	T	KC256	CHRIS	TRIPP	325 RIDGEWOOD CT.	LACKAWANNA	14218	823-3935	6
K26KY6	BRIAN	GASTLE	52 COLLINS AVE.	WEST SENECA	14224	823-6765	6	KC256	JOSEPH J.	STRELCZYK	21 ARNOLD RD.	LAKEVIEW	14085	627-5895	6
K26H06	JAMES	LIMMAN	151 SUNNYSIDE DR.	WEST SENECA	14224	674-4903	T	KC256	HARREN C.	HEERT	81 PELLHAM PL.	LACKAWANNA	14218	823-2550	6
K26NBI	WILLIAM	WALKDEN SR.	117 EAST AVE.	WEST SENECA	14224	674-0871	6	KC256	EDWARD	PATTON	918 RIVERVIEW BLVD.	TOWNANDRA	14150	877-6177	6
K26QLH	KEN	BROWN	S 3590 GRAFTON AVE.	BLASWELL	14219	823-8734	6	KC256	DAN	BRAYNTILLER	6660 VERSAILLES RD.	LAKEVIEW	14085	877-6177	6
K26RST	STEVE	LEITEN	6120 MCKIMLEY PKWY.	HAMBURG	14075	648-0341	A	KC256	STEVEN	KUSZA	2078 KIMBLE AVE.	H. COLLINS	14111	337-0289	6
K26RFT	JOHN	LEITEN	6120 MCKIMLEY PKWY.	HAMBURG	14075	648-0341	A	KC256	ROBERT	HINDY	4101 N. BAILEY AVE.	EGGERTSVILLE	14226		6
K26RFN	RANDY	SCHUELER	4611 LEWIS DR.	HAMBURG	14075	649-1925	A	KC256	MATT	BYTNER	10 HOBHAIL DR.	E. AMHERST	14051		6
K26RGA	CHUCK	LEITEN	6120 MCKIMLEY PKWY.	HAMBURG	14075	648-0341	A	KC256	MATT	GORSKI	6117 BROADWAY	DEPEN	14043	685-1755	E
K26TRP	FREDRICK	VELOTT	2545 SUNSET DR.	EDEN	14057	992-9160	6	KC256	ELWYN	GUEST	P.O. BOX 112	LANCASTER	14086	693-1720	E
K26TTT	LAWRENCE G.	LOCKER	5052 COLLEGE ST.	HAMBURG	14075	649-2770	T	KC256	VINCENT	PUSTELNIK	1133 CENTER RD.	WEST SENECA	14224	674-4788	A
K26JFM	KENNETH	DOMALDSON	46 FRONTIER DR.	BLASWELL	14219	824-4585	N	KC256	CASHIR(CASEY)	FERTITA	179 POTOMAC AVE.	BUFFALO	14213		E
K26VFK	SALVATORE	CARDINALE	16 STEARNS AVE.	LACKAWANNA	14218	822-9439	N	KC256	RICHARD	HUMBS	11315 CARY RD.	ALDEN	14004	683-3589	E
K26NCU	RALPH	MILLER	3384 B16 TREE RD.	HAMBURG	14075	627-9705	6	KC256	HARRY	CHANEY	39 WILLODALE DR.	WEST SENECA	14224	674-4704	6
K26JLZ	DARREN	JEWELL	S 8117 BOSTON ST. RD.	HAMBURG	14075	941-5569	N	KC256	HARRY	BARCLAY	1110 STOLLE RD.	ELMA	14059	652-2508	6
K26JWC	PAUL J.	SUNSKI	8 THOMASTON LA.	ORCHARD PARK	14075	668-9440	6	KC256	FRED	SHERBARTH	5438 GEORGE DR.	HAMBURG	14075	649-9621	A
K26JNA	MICHAEL	HARRER	6841 STENSON BOX 334	ARCADIA	14009	492-3198	T	KC256	CHARLES H.	PHILLIPS	61 PAYNE AVE.	BUFFALO	14220	826-2530	T
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KB2CLU	JOSE R.	VILLAR	41 PEARL ST.	LACKAWANNA	14218	823-9627	T	KC256	RICHARD S.	THRASHER	339 MAPLE RD.	EAST AURORA	14052	632-3734	E
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KB2EBI	DONALD	STILB	304 TINKHAM RD	DARLEN CTR	14040	591-0827	T	KC256	RONALD C.	STOLL	148 BARNABAS DR.	DEPEN	14043	683-6922	6
KB2EFK	STEVE	ZAJAC	1371 LOSSON RD.	DEPEN	14043	668-2501	T	KC256	PAUL G.	MEGER	6631 SCHERRT RD.	ORCHARD PARK	14127	662-9434	T
KB2EBV	STEVE	YEKICH	4340 CHISHOLM TRAIL	HAMBURG	14075	825-8049	T	KC256	WARREN	HERDIC	62 ZOLLARS AVE.	BUFFALO	14220	824-4180	T
KB2ESH	JOHN H.	CULLUM JR.	6871 E. QUAKER RD.	ORCHARD PARK	14127	662-7075	T	KC256	MALCOLM	VALLONE	192 INDIAN CHURCH	BUFFALO	14210	823-0473	T
KB2ESH	GARY C.	WOOD	73 HARTERHONT AVE.	BUFFALO	14220	823-0055	T	KC256	TONY	PISCITELLO	25 EUCLID AVE.	HAMBURG	14075	649-4658	6
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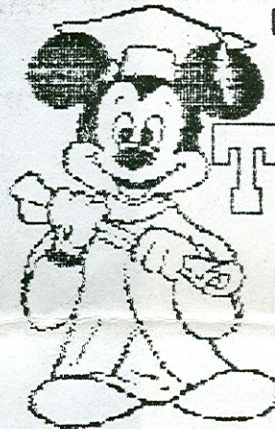
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