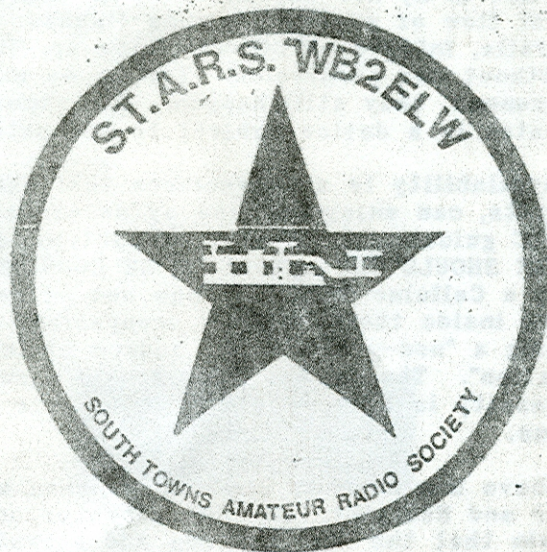


TELSTAR

KB2EQV
STEVE YEKICH
716-825-8049



Business Meeting = 6th July = NIKE BASE
 Board Meeting = ? July
 Nike Base open every monday night at 7:00pm until around 9:00
 Batavia Hamfest 9th of July at Alexander NY.
 TRI-County Amateur Radio Society "Swap & Shop" see flyer. July 29

Editorial

Ham Radio: Hobby or Hype

In the third edition of his dictionary, Webster defines hobby as follows:

'hob-by \ 'hábē, -bi\ n -ES [ME *noby, nobyn*, perh. fr. *Hobbin*, nickname of *Robert* or *Robin*] **1** or **hobby horse** *archaic* : a small or medium-sized light horse esp. of Irish origin having a gentle ambling pace **2** *archaic* : HOBBYHORSE **1,3** **3 a** : HOBBYHORSE **4a** **b** : a specialized pursuit (as stamp collecting, painting, woodworking, gardening) that is outside one's regular occupation and that one finds particularly interesting and enjoys doing usu. in a nonprofessional way as a source of leisure-time relaxation; *broadly* : any favorite pursuit or interest **4** *archaic* : DANDY HORSE

It just may be that a few of us "hobbyists" have come to rely upon a certain piece of club equipment just a bit too much. What equipment, you may ask; The club 2-Meter Repeater with it's fandangled computerized controller. This reliance, experienced by some, I hope is a result of the tremendous reliability of the STARS Machine. Thanks to the donations of all club members, the STARS Repeater is one of the best in the area.

As a hobbyist, I find ham radio to be a "pursuit that is outside" my "regular occupation", and "a source of leisure-time relaxation." It has been said that you "don't have to be a Gynecologist to enjoy sex." This is true however, at our last repeater work party (November '88), many members showed up to help and not one was a "PROFESSIONAL HAM". Not one there was even an Electrical Engineer. Just hobbyists; taping, wiring, climbing, bolting, configuring, transporting, etc., all trying to make the STARS Machine one of the best and most reliable machines in the area. One the entire club can be proud of.

It is not in my nor any other Ham's ability to control the natural flow of events; Lighting-flashes, Thunder-cracks, Rain-falls, Integrated Circuits-blow up, Wires-short out, and all without our permission. Try as we might to prevent such occurrences, they still happen. The repeater and its autopatch is a device subject to the natural flow of events.

It's availability is a convenience that the STARS members, as hobbyists, can enjoy and use as necessary (within the Club and FCC guidelines). A word of caution is required here; AT NO TIME SHOULD THE AUTOPATCH BE CONSIDERED A NECESSITY. Owning a Cellular Phone is done out of necessity by people working inside their "regular occupation" and not hobbyists pursuing a "non-professional source of leisure-time relaxation". The day we Hams consider our autopatches to be a necessity is the day the FCC will rule to take them away from us.

The above has been my right to express myself as a STARS Member and Hobbyist. As club repeater committee chairman, I proclaim that the club members and repeater committee members will do all in their power to keep the club repeater up and running no matter what natural events may occur. But it is a machine and only a machine, subject to the natural flow of

events. At no time should it be depended upon in a life and death situation.

Bill N2GAO

P.S. The new repeater controller software, version 4.0, is in and should be in place by press time. A user command update sheet along with information on the new software, will be enclosed in the next Telstar. So, stay tuned.

Gossip Column

Before you plan to attend the July 6th STARS meeting please see the front page of the Telstar and you'll see it is at the Nike Base. As a rule it is held in a different place due to the youth center getting closed for remodeling.

Well as you read this, field day will be history and I am sure that all the members that attended enjoyed themselves. You know that it is always a good place to pick up quite a lot of info on antenna building and installation.

The low bands have hit a slump lately and the noise level has increased, but be patient better times are on the way.

By the way on page 50 in the July issue of C.Q. magazine is a very fine article upon Electric Shock "How Much Kills" quite a few good hints to make your shack Shock proof.

As most of you have noticed the weather man had not given us as many nice days to get your antennas up but don't despair, it can't last too long so be prepared.

There is still some more antenna wire at the Nike base. If you need some the club room is open every Monday evening so bring your sizes and lengths down there and go home happy. The clutch on the ground wire plow has been repaired, thanks TO: NORM KD2KK and it is ready for any member who is thinking of putting in a series of ground wires at his or her QTH. By the way you need a truck or station wagon.

There is a Batavia Hamfest at Alexander, NY on Sunday July 9th from 6am to 4pm. If you have spare time Sunday it is a good way to spend it at a hamfest.

They seem to get a good crowd at it. The end of the month on July 29 there will be a Electronic auction in Gowanda, NY. More info on this on our nets, so keep listening on the nets for the latest info on these last minute places.

See You July 6th

GUZ WB2EZU

This year's field day will be held at the Hamburg Moose Club on Church street in the town of Hamburg. (See Map) We will be starting at 10:00am Saturday the 24th and running till 2:00pm Sunday the 25th.

Field day is the place to learn, to work, to operate, or just to hang out with the guy's.

For learning we will have different types of antennas, a SSB station, CW station, packet station and a TECH/NOVICE station.

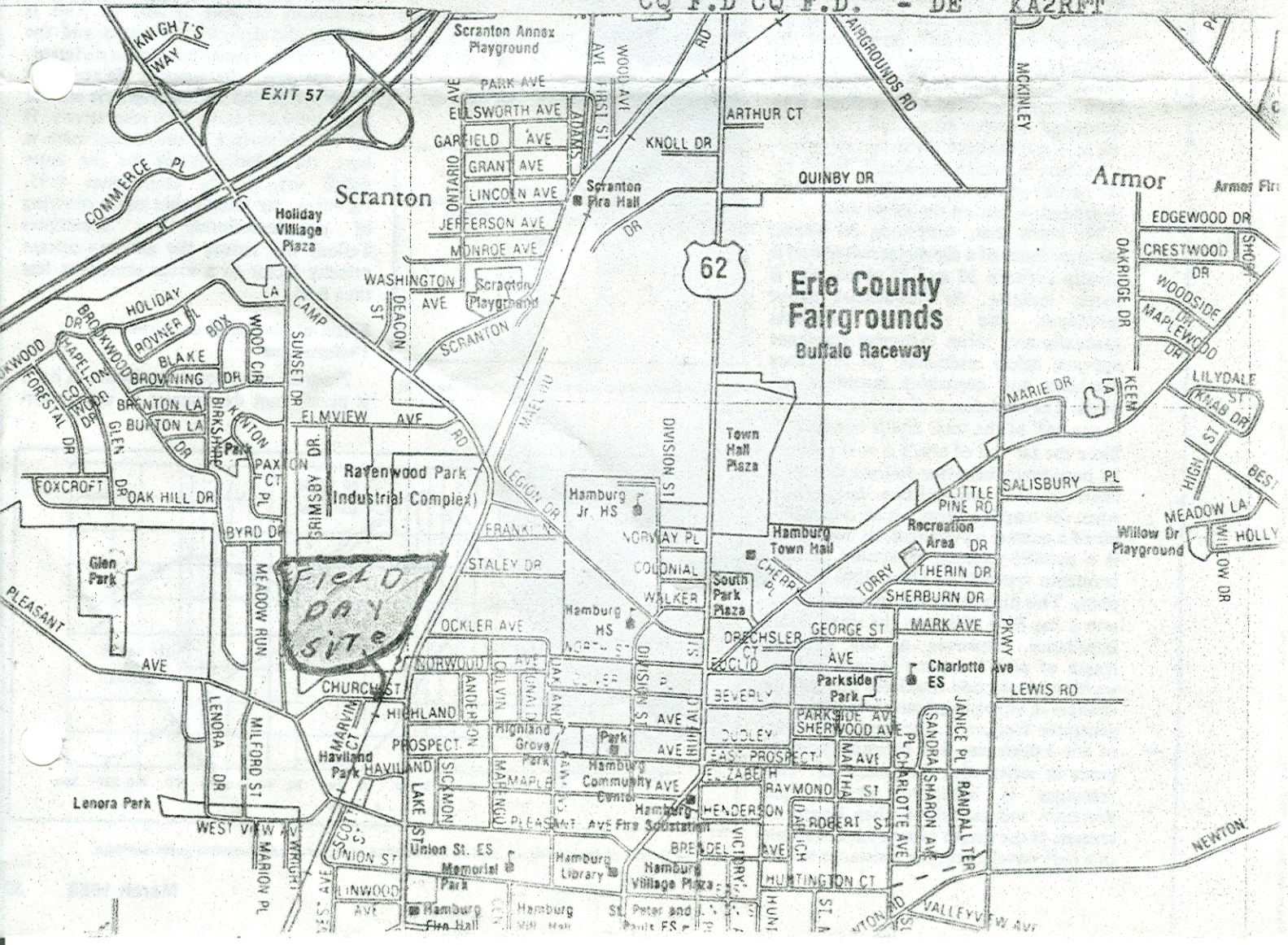
For work, not that much, we will need lots of Hams (hands) for the setting up and taking down of antennas etc. A lot of wire to be set out-power lines from the generator, antennas vertical, dipole, long wire, and what ever else we can think of.

For operation, WB2ELW will go on the air 2:00pm Saturday and will run for 24hrs until 2:00pm Sunday. In the past years the bands were still very HOT late late into the night.

For just Hanging out with the guys, set up your lawn chair in the sun or in the shade. By the way you might have to talk to the public. We are running ads in the local paper for them to come and see us do our stuff. So you might have to point and say that's a radio, that's the antenna he is talking to texas with. You know that high tech talk.

We have 24hr indoor plumbing so come on out- Field day is the place to be. Work, Sit, or just play in the sun or shade (No rain please). We have that covered also. Check out the map.

See you all June 24th and 25th
CQ F.D CQ F.D. - DE KA2RFT



and I_4 will be nearly equal. On the other hand, if the rf path to ground is a multiple of a half wavelength, the impedance will be fairly low and current I_3 may be substantial, — resulting in unequal currents in the dipole arms and radiation from the feed line. In many instances, this rf path to ground includes the transmitter line cord and some house wiring, terminating at the power-line ground! Thus, the amplitude of I_3 varies with changes in feed-line length because of impedance effects.

Effects of I_3 on Antenna Impedance

It should be kept in mind that transmission-line currents I_1 and I_2 cannot produce radiation because their fields are not only of equal magnitude and opposite phase, but are confined within the shield of the coaxial cable. The field developed by I_3 does radiate, however, and thus the outer surface of the coaxial braid effectively becomes "dipole" arm 3, which is connected in parallel with arm 2.

To clarify this equivalent connection of radiators, I've simplified the circuit as shown in Fig. 2. Since I_1 and I_2 do not interact with any other currents, we may hypothetically place the rf generator directly between the input terminals of the antenna. Now that coaxial cable is no longer needed to transfer power from the generator to the antenna, the third conductor of the feed line (the outside surface) can be replaced with a single wire connected between arm 2 and rf ground. We have not changed the circuit electrically because I_3 , which previously flowed on the outside of the coaxial cable, still flows to ground — but on the single wire.

We know that, depending on height, the impedance of a dipole (at resonance) is usually between 50 and 75 ohms, and is purely resistive. At frequencies above resonance, the resistance increases gradually and series inductive reactance appears; below resonance, the resistance decreases and capacitive reactance appears. The impedance of each dipole arm is one half of the total dipole impedance. Since the far end of arm 3 is at rf ground, its impedance behavior follows that of a short-circuited transmission line. Thus, when the length of arm 3 is an odd multiple of a quarter wavelength, its impedance is a parallel-resonant maximum, a high resistance typically of about 2000 or 3000 ohms. This high resistance in parallel with arm 2 has little effect on the total dipole impedance. However, as the effective length of arm 3 departs from a quarter wavelength (or odd multiples thereof) by changes in either its physical length or the generator frequency, the input resistance of arm 3 decreases, and reactance also appears in series with the resistance. This reactance is inductive when length decreases and capacitive when length increases. If the length of arm 3 is a multiple of a half wavelength, the resistance will be

a series-resonant minimum value (but not zero, because of radiation). Thus, when arm 3 departs substantially from an odd multiple of a quarter wavelength, the net resistive and reactive components of the parallel combination of arms 2 and 3 are different than those of arm 1. Consequently, the dipole impedance is different than if arm 3 was not present.

Returning to Fig. 1, we can now see that, without a balun, changing the feed-line length is also a change in the antenna length, which in turn affects the impedance at the far end of the feed line. Therefore, the SWR measured at the transmission line input changes with line length when no balun is present to eliminate I_3 . This phenomenon explains a point that is often puzzling for the amateur who uses no balun, and must trim his dipole each time the feed-line length is changed!

Function of the Balun

It is evident that, in coupling an unbalanced line to a balanced load (such as a dipole), the primary function of a balun is to block the current path between the inside and outside surfaces of the coaxial shield. With a balun in the circuit, I_2 will not divide at the end of the feed line to form I_3 , but instead will flow only onto dipole arm 2. Thus, when I_1 is zero, $I_4 = I_1$, and the currents flowing on dipole arms 1 and 2 are balanced.

Although I pointed out this concept to

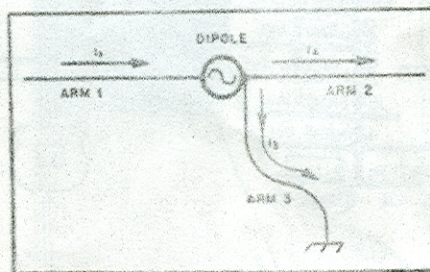


Fig. 2 — Simplified electrical representation of Fig. 1.

Reisert for use in his balun article, he apparently missed my point concerning the source of external current I_3 . Consequently, his Fig. 2 and associated paragraph not address the principal function of a balun. Contrary to his explanation of Fig. 2, when antenna currents on the feed line are caused by asymmetrical coupling to the antenna, a balun will not eliminate these currents, but will only change their phase and magnitude.

Effect of No Balun on Measurement Accuracy

It should be obvious that obtaining accurate impedance measurements of a dipole antenna is difficult. When a transformer-type balun is used to avoid errors caused by I_3 , impedance-transfer errors obscure the true impedance at the antenna terminals. If the balun is omitted, the true impedance is obscured by the impedance of arm 3 shunting one half of the dipole. Since there is no practical way of determining the impedance of arm 3, the true antenna impedance and SWR cannot be calculated from the measured data.*

We should bear in mind that for any given physical length of feed line, the electrical length of the coaxial braid surface carrying I_3 is not the same as the inside conductors carrying I_1 and I_2 . This is because the dielectric constants and the propagation-velocity factors are different. For example, the velocity factor for polyethylene and Teflon dielectric coaxial cable are 0.659 and 0.695, respectively. If the outside surface of the coaxial cable is bare, the velocity factor for the outer shield carrying I_3 approaches 0.95. However, the usually thin outer covering of polyvinylchloride (or sometimes Teflon) will reduce the antenna-current velocity factor to a value somewhat less than 0.95.

Effect of No Balun on Antenna Performance

From an operational viewpoint, I_3 itself is usually not detrimental to the perfor-

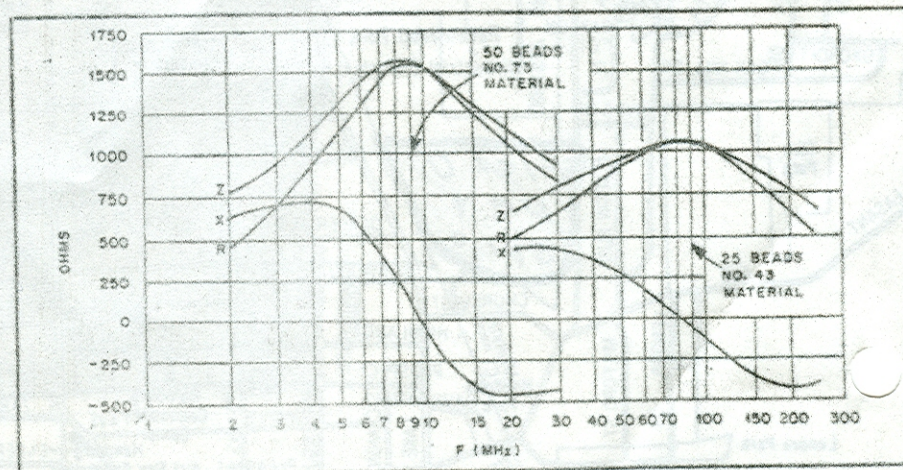


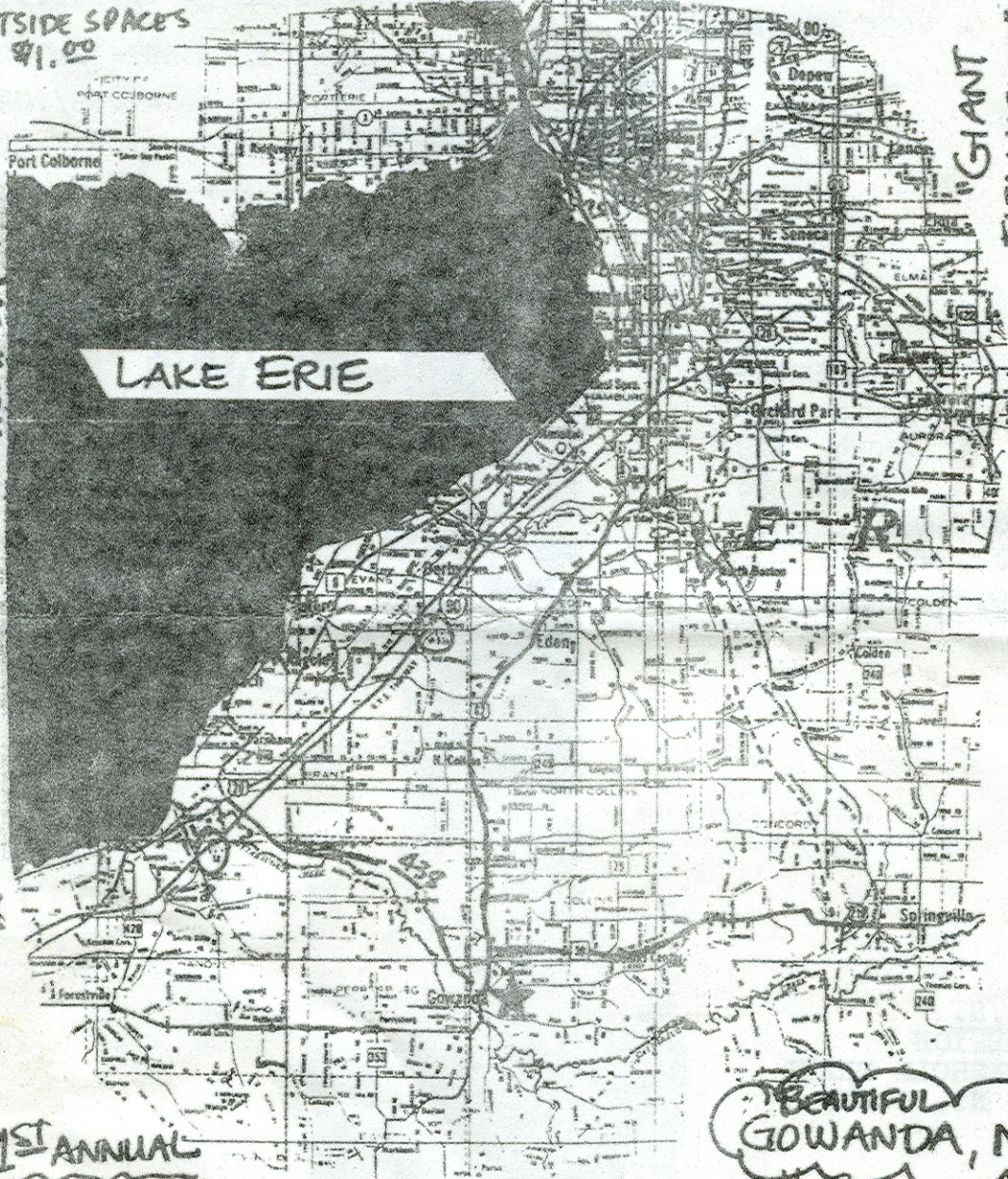
Fig. 3 — Graph of frequency vs. series impedance of coaxial-balun shield outer surface.

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BOARD MEETING = 4th TUESDAY

1900 HOURS = YOUTH CENTER

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75 METER NET = EACH SATURDAY AT
1000 HOURS = +/- 3925 KHZ

2 METER INFO NET = EACH WEDNESDAY AT
1900 HOURS = 147.69/.09

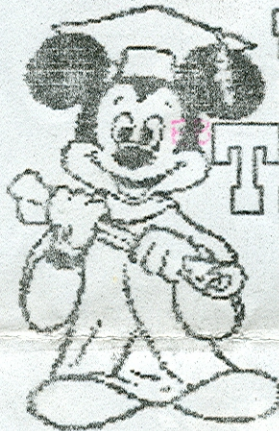
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