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WATTS

06 - 2007

Year 77+6m

Monthly newsletter of the Pretoria Amateur Radio Club
Maandelikse nuusbrieff van die Pretoria Amateur Radio Klub.



PARC, PO Box 73696 Lynnwood Ridge 0040, RSA



<http://www.zs6pta.org.za> mail:zs6pta@zs6pta.org.za

Bulletins :145,725MHz 08:45 Sundays / Sondae

Relays : 1840, 3700, 7066, 10135, 14235 kHz, 51,4 and 438,825 MHz

Activated frequencies are announced prior to bulletins

Swapshop: Live on-air after bulletin 2m and 40m

Bulletin repeats | herhalings : Mondays 19:45 on 145,725 MHz

5 May: Presentation by Roy ZS6XN on Battery State Indicators



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Next Meeting 2 June 2007

Time: 13:30 for 14:00
PARC Clubhouse
South Campus
University of Pretoria
SE cnr University and
Lynnwood roads.

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Minutes of the monthly club meeting of the Pretoria Amateur Radio Club held at the South Campus of the University of Pretoria on 5 May 2007

Welcome/Verwelkoming. Almero ZS6LDP declared the meeting open and welcomed all present.

Attendance/Bywoning. The meeting was attended by 23 members and 4 visitors.

Apologies/Verskonings.

Edwin Peer ZR6ESP, Hilary Peer ZR6HAP, Brendan Smith ZR6BM, Tobie Janse van Rensburg ZS6XZ, Roy ZS6MI, Mike ZS6AFG, Molly ZR6MOL, Malcolm ZR6OLM, Helen Newton and Ivan ZS6CCW.

Personal Matters / Lief en Leed.

Don ZS6CRT is seriously ill.

Bernie ZS6ANU is recovering after a long illness.

Mike ZS6AFG is in hospital for a small operation.

Ivan ZS6CCW running a high fever and is advised by his doctor to rest.

Matters arising from previous minutes / Sake voortspruitend uit vorige notule. None / Geen.

Approval of previous minutes / Goedkeuring van vorige notule.

The minutes of the previous meeting as published in Watts were approved. Proposed by Alf ZS6ABA and seconded by Chris ZS6BGH.

Club Activities/ Klub Bedrywighede.

Rallies/Tydrenne. Johan ZS6JHB.

Johan thanked everybody who assisted with comms during the Sasol Rally. The next event will be the Zulu Rally in KZN which is scheduled for 26th and 27th May in Durban and surroundings. Thirteen amateurs will be providing communications during the event, three in Command Centre and ten doing duty as field stations.

Foxhunts / Jakkalsjag . Richard ZS6UK: Due to the approaching winter Foxhunt activities have been put on hold till September.

Social / Sosiaal . Johan ZS6JHB.

Bring en braai na afloop van elke klubvergadering..

Members are reminded of the bring & braai which will now take place after every club meeting.

Hamnet . Johan ZS6JHB:

Hamnet Gauteng Noord se bulletin vind plaas op Maandag aande om 19.00 op 145,725.

Financial Report / Finansies. Richard ZS6UK.

Finances in order.

Technical / Tegnies.

Craig ZS6RH reported on the current status of the repeater network.

Fleamarket / Vlooiemark. Almero ZS6LDP:

Almero ZS6LDP informed the meeting that the next fleamarket will take place end June 2007.

Projects/Projekte:

Hans ZS6KR reported that no new project is at hand.

General / Algemeen:

Hans ZS6KR, requested members expecting QSL cards to make arrangements to get the cards from the SARL.

Presentation / Aanbieding .

Roy Newton ZS6XN did a presentation on LED battery state indicators which will be available soon.

Next meeting / Volgende vergadering.

The next meeting will be on the 2nd of June 2007. Starting time 14:00.

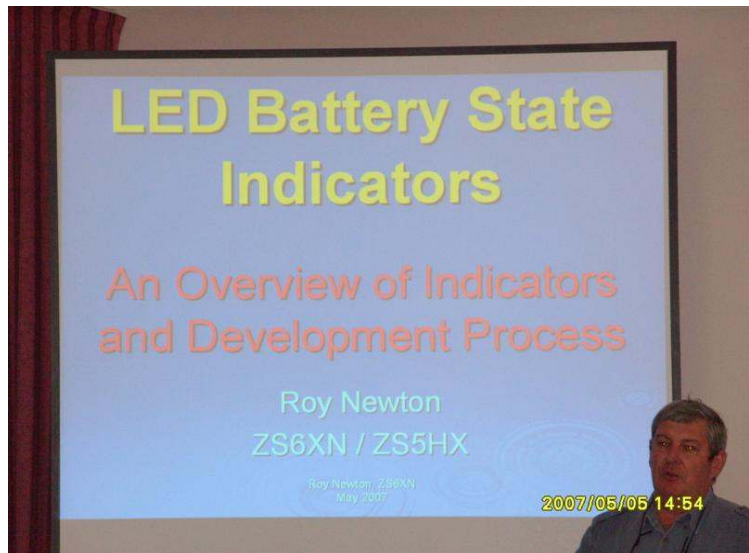
Remember the braai afterwards / Onthou die braai na afloop van die klubvergadering.

Closure / Sluiting:

The meeting closed at 15.00.



Craig ZS6RH giving feedback on the 2m diversity-reception repeater project and current problems with interference



Roy ZS6XN presented an interesting lecture on battery status indicators. 3- and 10 LED models will soon be available as kits. Let him know if you would like one.

Editorial

A club newsletter is surely not only for its members, but also by its members.

I can count the number of members that have contributed over the past 3 years on the fingers of both hands and find that very disappointing. Surely most of you have a digital (cell-phone) camera to show other members what is potting in your station, your mobile or on the workbench? Any project you are busy with? Document it so we can all harvest knowledge from your activities and at the same time show us what you yourself look like doing it.

What may be uninteresting to you, can be informative to others.

Is it inwardness, modesty or lack of interest that has stopped you? Please reconsider and let us have something that others can read or see about fellow club members.

On another note: Did you think SARL fees are expensive or not worth while? Proportionally we are paying little. Countries with many thousands more members are paying as much - and more:

USA \$39 (≈R284)

Britain £44 (≈R620)

Due date for membership fees of both our club and the SARL is the end of June. Your support will be appreciated.

Redaksioneel

'n Klub nuusbrieff is tog sekerlik nie net vir sy lede nie, maar ook deur sy lede.

Ek kan op altwee hande se vingers die

aantal lede tel wat bydraes oor die laaste 3 jaar gemaak het en dit is baie teleurstellend. Julle het tog sekerlik 'n digitale (selfoon) kamera om ander lede te kan wys wat skud by julle stasie, mobiel of op die werksbank? Dokumenteer dit tog dat ons almal kennis kan neem van jou bedrywighede en hoe jy self lyk terwyl jy dit doen.

Wat vir jou oninteressant is, is vir ander dalk nuus vir ander.

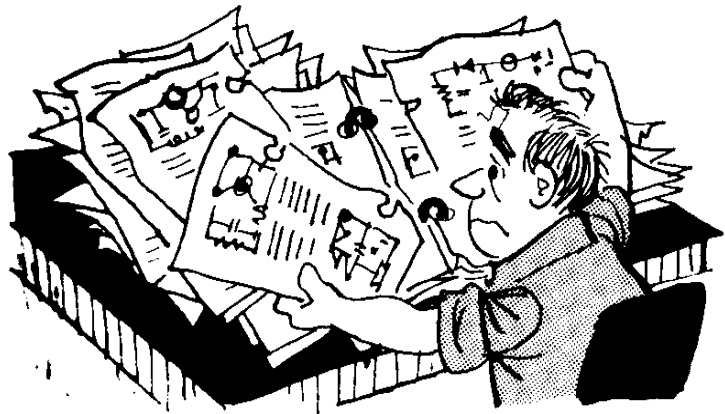
Is dit teruggetrokkenheid, beskeidenheid of te min belangstelling wat jou keer? Heroorweeg asseblief en laat ander ook iets kry om te lees of sien van mede-klublede.

Op 'n ander noot: Het jy gedink die SARL foemie is hoog of nie die moeite werd nie? Proporsioneel betaal ons eintlik weinig. Lande met baie duisende meer lede betaal net so veel - en meer:

VSA \$39.00 (≈R284)

Brittanje £44.00 (≈R620)

Einde junie is ledegeld-tyd vir beide ons klub en die SARL - U ondersteuning sal waardeer word.



Birthdays

June Verjaarsdae



02 Elma, sw of Chris ZS6LOG
 05 Louis ZS6LVW
 06 Herman ZS6SN
 07 Chantel, dogter van Marite en 'JB' ZR6YV
 08 Ronel, sw van Pieter ZR6PSR
 11 Nadia, daughter of Pat ZR6AVC and Frank ZS6GE
 14 Attie ZR6REY
 14 Hilary ZR6HAP, daughter of Molly ZR6MOL and Richard ZS6UK
 17 Lynette ZR6LHT, dogter van Elize en Pieter ZR6AHT
 20 Malcolm ZR6OLM, son of Retha and Roy ZS6XN

Junie

Anniversaries Herdenkings

07 May and Wally ZS5WP ()
 24 Marieta and Roy ZS6MI (36)

22 Richard ZS6UK
 23 Annemie, dogter van Bernice en Pieter ZR6KSA
 25 Angie, sw of Trevor ZS6-2510
 26 Pieter ZR6PSR
 27 Jac ZS6QA
 27 Selma, sw of Joe ZS6TB

Sick Parade | Krukkelys

Bernie ZS6ANU is being treated for leukaemia
 Mike ZS6AFG underwent a minor operation

Helen, daughter of Roy ZS6XN underwent a back operation

Don ZS6CRT is under treatment for lung cancer

Carl ZS6NCC is in frail care

Ivan ZS6CCW was confined to bed for a while

Diary | Dagboek (UTC times)

June 02-03 IARU Region I Field Day, CW 1500-1459
 09 Portugal Day Contest 0000-2400
 16 Youth Day
 16-17 All Asian DX Contest CW 0000-2400
 17 Father's Day
 22 Inland schools close
 23-24 King of Spain Contest SSB 1200-1200
 23-24 ARRL Field Day 1800-2100

PARC SUBS / LEDEGELD 30-06-2007

Please remit your subs in
 time to our treasurer or
 by transfer to:

Betaal asb. u ledegeld
 betyds aan ons tesourier
 of per oorplasing aan:

Bank : FNB Ordinary members/ gewone lede R70
Branch : 25 20 45 Spouses, pensioners R50
Account : 546 000 426 73
Your call sign must appear as statement text!

Snippets | Brokkies

- **Jaco ZR6JLL** het met sy ekspedisies die koerant gehaal en ook die radio.
- Our next **PARC Fleamarket** will be in mid-winter on June 30.
- After every club meeting there will be a **bring-and-braai** in the quadrangle below the clubhouse
- Note **that all HF operators** should from now on send **SASE's to the SARL QSL Bureau** in order to get incoming QSL cards posted to you. The service to club meetings by Hal ZS6WB cannot any more be guaranteed.

Paper donations are again invited. We will acknowledge your gift by placing your call sign below our logo on page 1.

Tshwane Beeld

Jaco ZR6JLL

Woensdag 2 Mei 2007

Blinde pak die berge

Uitdagings is kos vir Grintek-werknemer

Nicolette Dirk

'n Blinde man van Centurion se jongste uitdaging is om die Drakensberg oor te steek.

Jaco Lubbe (30), 'n werknemer by SAAB Grintek in Centurion, het al ses Argus-fietstoere voltooi en die Twee Oseane-halfmarathon kafgedraf.

Benewens die feit dat dié uitdaging wat vir Jaco voorlê, beskou word as die Comrades-marathon van bergklim, is dit soveel meer indrukwekkend omdat hy blind is.

Hy het reeds by Mount-aux-Sources in Witsieshoek met die tog begin en hoop om 13 dae later by Bushman's Neck te eindig.

Die Drakensberg is Suid-Afrika se hoogste berg en ook van die moeilikste om te klim weens die onvoorspelbare weerstoestand.

Lubbe is as kind met makulêre degenerasie gediagnoseer wat veroorsaak het dat hy sy sig verloor het.

As hoërskoolleerling by die Pioneer Braille-skool in Worcester het sy gestremdheid hom nie ontmoedig om saam met die skool se voetslaanclub talie berge aan te durf nie.

As voorsitter van dié skool se voetslaanclub was hy deel van baie veldtogte om berg- en natuurroetes vir gestremdes meer toeganklik te maak.

Die doel van die Drakensberg-uitdaging is om werkgewers



Mnr. Jaco Lubbe met sy getroue gidshond, Yarty.

Foto: DEAN VIVIER

bewus te maak van blinde mense se vermoëns.

"Ek wil aan werkgewers bewys dat blinde mense bevoeg en bekwaam is."

Hierdie is ook nie Jaco se eerste berg nie. Hy het vroeër al Kilimandjaro geklim en het ook deur die Visrivier-canyon gestap.

En hier gaan dit nie eindig nie. Jaco beoog om nog talie berge te klim en daar te bid.



This pile of cards were from overseas stations QSLing contact with ZS75PTA in 2005. These are mainly the result of QSO's with our Field Day stations, Hans ZS6KR in the BERU Contest, and Ivan ZS6CCW who put in a big effort



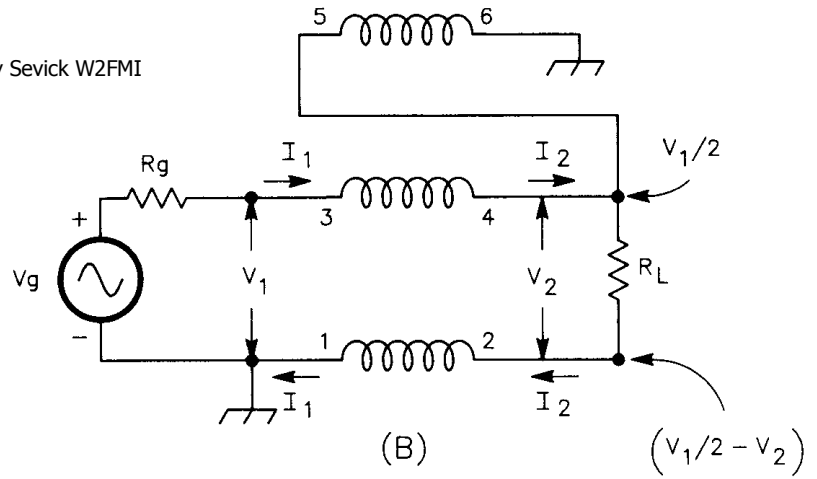
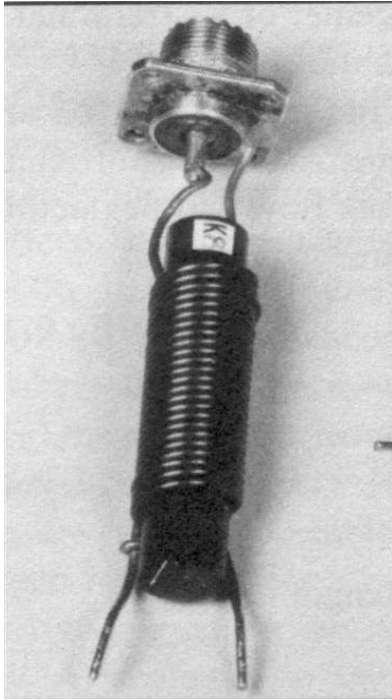
This striking shot is of Ed ZS6UT's magnetic loop (described in WATTS Aug 2003). Here an incandescent tube was placed close to the feedpoint and was greatly excited due to the high voltage field running 200w PEP on 80m. Ed says you can actually read the light semaphore effect.

SASOL RALLY May 2007

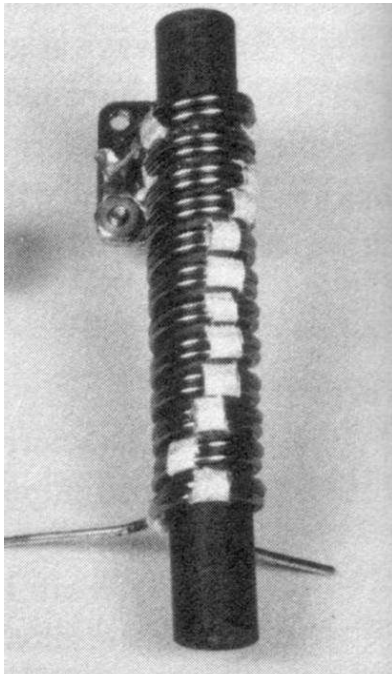


Ruthroff balun

From "Transmission Line Transformers" by Jerry Sevick W2FMI



A commercial W2AU (Ruthroff design) balun using 8 trifilar turns of no. 14 wire on a 2½-inch long rod. The characteristic impedance is 43 Ω. The third wire, winding 5-6 in Fig 9-1B, is placed between the other two windings. Without this third wire, which acts as an electrostatic shield, the characteristic impedance of a tightly wound bifilar winding of no. 14 would be 25 Ω. This balun has been widely used on triband (10, 15 and 20-meter) Yagi beams. At much lower frequencies, the performance becomes marginal. It is recommended that this balun not be used below 3.5 MHz.

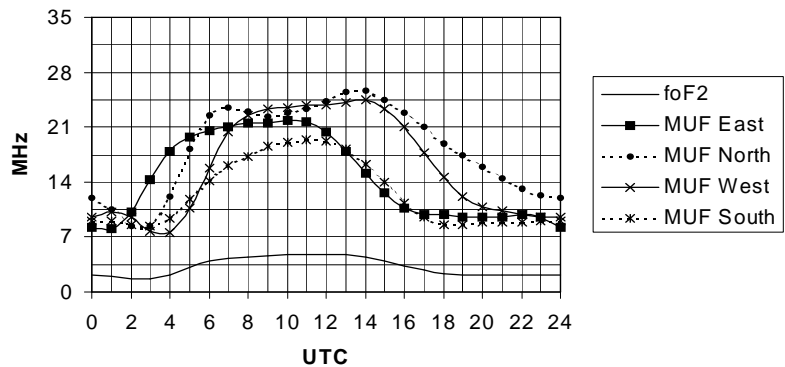


Guanella balun

A Guanella balun using 12 bifilar turns of no. 14 wire on a 4-inch long rod (a 3-inch long rod would do as well). The treatment of the wire is the same as (B) above. This balun is capable of operating from 1.7 MHz to 30 MHz. If operation is limited to the 40, 80 and 160-meter bands, then 14 bifilar turns are recommended. This would allow for more margin on 160 meters.

Long Term HF Propagation Prediction for June 2007 (courtesy Vince ZS6BTY)

F2 Critical Frequency and 4000 km MUF: Pretoria - June 2007



DX Operating

The graph shows the 4000 km maximum useable frequency (MUF) to the East, North, West and South from Pretoria for the first hop using the F2 layer.

Local Operating

The F2 critical frequency (foF2) is the maximum frequency that will reflect when you transmit straight up. E-layer reflection is not shown.

Notes on Home-Built Antenna Hardware

with permission from **L. B. Cebik, W4RNL**

These notes represent a set of practices that I prefer. The collection is not the only way to do things, but it is one fairly good way among the many acceptable practices. Nevertheless, I recommend that you examine various antenna handbooks for alternatives. We all have different skills and our access to materials may vary. The more techniques that you have at your disposal, the easier it will become to find the ones that fit your circumstances.

Beam Antenna Hardware My preferences for beam construction all focus upon one word: quality. Quality construction is a synonym for durability, that is, the ability of the beam antenna to perform for a long period with all of the capabilities it had when you first put it in place. Quality beam construction breaks down into three main materials: stainless steel, aluminum, and polycarbonate.

Stainless Steel

I prefer to use only one material for all antenna hardware: stainless steel. Not many years ago, we had to use mail order or on-line sources for stainless steel nuts, bolts, and washers. However, these items are now regular stock in many home centers. The reason why I prefer stainless steel is simple. Virtually all beam antennas bring together at least two materials: aluminum and copper.

Dissimilar materials are subject to electrolysis, the corrosion of materials due to a difference in the atomic electrical potential of each material. Copper and aluminum are both conductors, but we cannot durably join the two at a connection point. When some home builders resorted to cheaper aluminum AC wire, they had to find connectors that would prevent electrolysis between the aluminum wire and the brass (mostly copper) screws at the terminals. Only power companies use aluminum wire these days and homes have returned to an all-copper status.

The rate of corrosive effects between dissimilar metals depends on their "nobility." The more distant the metals on the chart (see **Table 1**), the greater the potential between them, even in the most weather-protected conditions. As the table notes, a difference of only +/-0.3 volts between the atomic potential of two metals at a junction indicates the strong possibility of significant corrosion at the junction.

Atomic Potential of Various Metals that Might Come into Contact with Each Other									Potentials in volts				Table 1
Metal	Magnesium	Aluminum	Zinc	Iron	Cadmium	Nickel	Tin	Lead	Copper	Silver	Palladium	Gold	
Magnesium	0.00	-0.71	-1.61	-1.93	-1.97	-2.12	-2.23	-2.24	-2.71	-3.17	-3.36	-3.87	
Aluminum	0.71	0.00	-0.90	-1.22	-1.26	-1.41	-1.52	-1.53	-2.00	-2.46	-2.65	-3.16	
Zinc	1.61	0.90	0.00	-0.32	-0.36	-0.51	-0.62	-0.63	-1.10	-1.56	-1.75	-2.26	
Iron	1.93	1.22	0.32	0.00	-0.04	-0.19	-0.30	-0.31	-0.78	-1.24	-1.43	-1.94	
Cadmium	1.97	1.26	0.36	0.04	0.00	-0.15	-0.26	-0.27	-0.74	-1.20	-1.39	-1.90	
Nickel	2.12	1.41	0.51	0.19	0.15	0.00	-0.11	-0.12	-0.59	-1.05	-1.24	-1.75	
Tin	2.23	1.52	0.62	0.30	0.26	0.11	0.00	-0.01	-0.48	-0.94	-1.13	-1.64	
Lead	2.24	1.53	0.63	0.31	0.27	0.12	0.01	0.00	-0.47	-0.93	-1.12	-1.63	
Copper	2.71	2.00	1.10	0.78	0.74	0.59	0.48	0.47	0.00	-0.46	-0.65	-1.16	
Silver	3.17	2.46	1.56	1.24	1.20	1.05	0.94	0.93	0.46	0.00	-0.19	-0.70	
Palladium	3.36	2.65	1.75	1.43	1.39	1.24	1.13	1.12	0.65	0.19	0.00	-0.51	
Gold	3.87	3.16	2.26	1.94	1.90	1.75	1.64	1.63	1.16	0.70	0.51	0.00	

Notes:

1. Accelerated corrosion can occur between unprotected joints if the algebraic difference in atomic potential is greater than +/-0.3 volts.
2. Metals are considered more noble as they move from Magnesium to Gold.
3. For any two metals in contact, a less noble metal is considered more "anodic" and will give up metal in a contact joint.
4. Adapted from page 18 of *The Grounds for Lightning and EMP Protection*, 2nd Edition, PolyPhaser Corporation.

Anatomy of a Workable Multi-Metal Connection

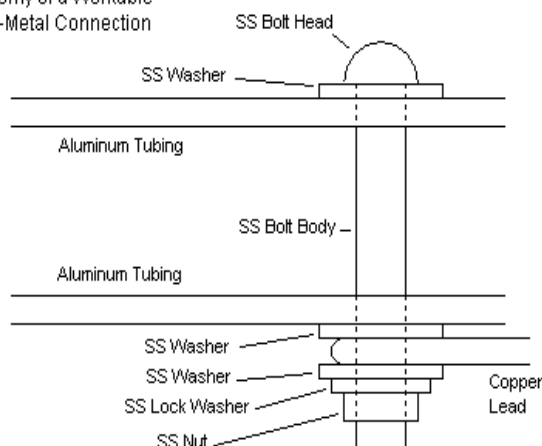


Fig. 1

Note how far apart that aluminum and copper fall on the table.

Stainless steel is generally inert to electrolysis. Hence, it makes the best simple buffer between different metals that might show significant corrosive effects. **Fig. 1** shows a sample connection at possibly the feedpoint of a beam's driven element. Note that the system uses not only a stainless nut and bolt, but also stainless washers. Hence, the copper wire is isolated physically but not electrically from the aluminum tube.

Two washers deserve special mention. I place a washer under the bolt head to spread the force that the head exerts on the softer aluminum tube. Excess tightening will not result in the bolt head widening the hole in the tubing. In most cases, I add a fiberglass rod within the tube to strengthen the assembly. If I butt-join tubes, I add an inner tube for the same reason.

The other notable washer occurs next to the nut. I use a stainless lock washer to ensure that the assembly does not come apart after a season of flexing in the weather.

Aluminum

The subject of aluminum bothers many a newer antenna builder because of its cost if we buy it new from reputable sources. Due to cost, many builders resort to wire beams, while others build only antennas for which they can find used TV antenna elements. At one time, home centers carried a large and varied stock of aluminum tubing, but in recent years, the centers have shifted their stocking philosophies from "do-it-yourself-in-your-own way" to "do-it-as-pre-packaged." Some antenna builders have shifted to the use of L-stock and square stock.

First, round tubing is the best material available for HF antenna elements, since it tends to slip the wind best. Flat surfaces tend to increase wind resistance. Second, I do not recommend even home-center tubing for antennas designed to withstand many seasons of rough weather. The tubing available in home centers is of dubious lineage, and its strength data is often wholly unavailable. Most of all, I do NOT recommend the use of aluminum conduit for antenna elements. Conduit is a form of softer pipe. It not only weighs more than tubing, it also bends permanently under loads.

The best material for U.S. antenna builders is 6063-T832 aluminum tubing, available from various outlets. The tubing is strong, and the most common wall thickness for the home antenna builder is 0.058". It is also available in outer diameter increments of 1/8" (0.125"). If we used a wall thickness of 0.0625"-- that is, 1/2 the increment between tubing sizes -- we would ideally have a perfect

Aluminum Tubing
Types and Overlap

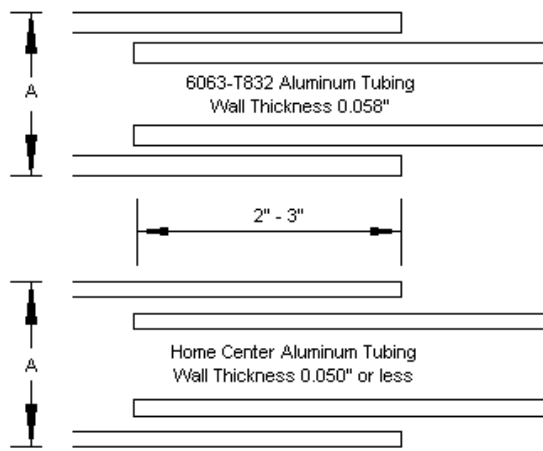


Fig. 2

fit from one size to the next. However, this approach fails to recognize that even computer-controlled industrial processes have allowances. Hence, the 0.058" wall thickness allows the closest practical size for nesting one tube inside the next larger size, as suggested in Fig. 2.

The lower portion of the figure suggests the use of home-center tubing, which usually has a wall thickness of 0.050" or less. Note the larger spacing between the nested segments. The larger spacing yields more wiggle room, which calls for special measures to ensure a tight mechanical bond between element sections. The upper portion of the sketch with the standard 6063-T832 tubing would allow the use of a simple pair of sheet metal screws to bond the sections--stainless steel sheet metal screws, of course.

The sketch also specifies an overlap of 2" to 3" at the junction. There are special cases in which it is wise to double tubing. For example, the centermost part of a 20-meter beam element might use about 3' of 1.25" stock. The next exposed length might be only 24" or so, but the 1.125" tubing would go all the way to the element center, giving the middle of the element extra strength to bear higher wind loads. Where we do not need doubling strength, 2" to 3" of overlap is sufficient to provide a strong connection without adding unnecessary weight to the element.

Some antenna makers prefer to use thinner-wall tubing to create equally strong but lighter and more flexible element assemblies. Other makers use swaging techniques to decrease the element diameter by either 1.5 or 2 steps, relative to our standard 1/8" increments. In most cases, the home builder does not have access to the necessary equipment to handle such techniques, and the lighter tubing in the requisite aluminum type may not be readily accessible. Hence, the use of the tubing that we have noted is almost the *de facto* American standard. In contrast, European antenna makers tend to prefer heavier tubing (in metric increments, of course). Their antennas tend to bear larger ice and snow loads, but may require a larger rotator to turn effectively.

Polycarbonate

Since I use antenna modeling software to design antennas that I build, I always plan on insulating and isolating the elements from the supporting boom. NEC and MININEC calculate only axial currents along an element and hence cannot show the effects of the boom, were we to make a direct connection. All beam designs that appear at this site either use non-conductive booms or use plates to insulate and isolate the elements from the boom.

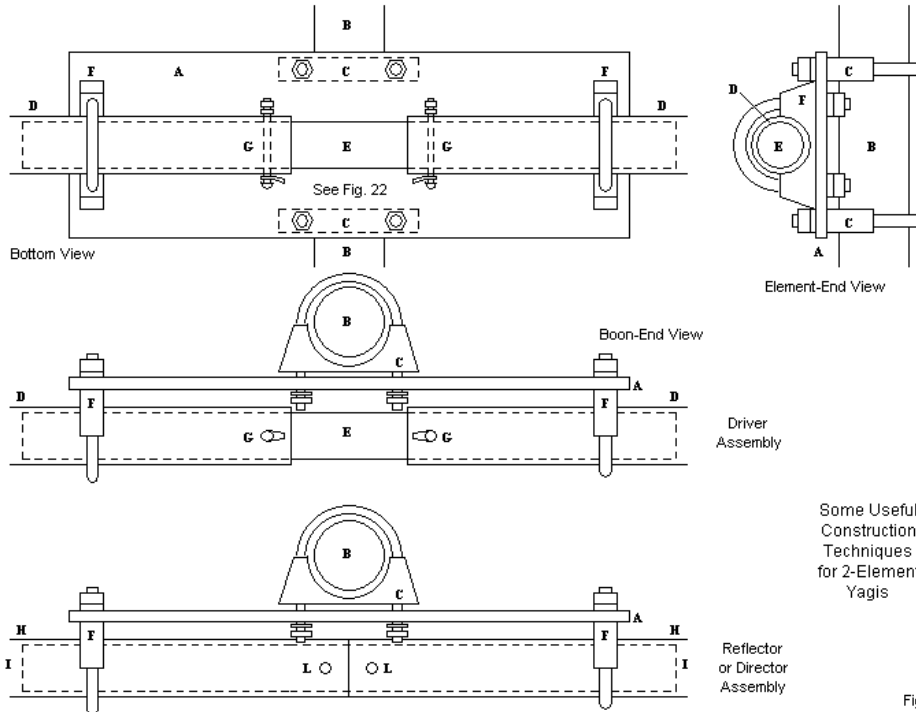
Table 2. Key to elements in the constructions sketches (See Fig. 3 and Fig. 4)

A	Polycarbonate element-to-boom mounting plate
B	Boom
C	Boom stainless-steel U-bolts and saddles
D	Driven element tube
E	Driven element gap insulating rod or tube
F	Element stainless-steel U-bolts and saddles
G	Stainless-steel nuts/bolts/washers/soldering lugs
H	Reflector or director element tubes
I	Inner linking conductive tube
J	L-stock coax connector mounting plate
K	Through-chassis coax connector
L	Stainless-steel sheet-metal screws

At HF, the best plate material in my experience is polycarbonate. Lexan is a GE trademark and trade name for the material. Do not confuse the material with acrylic materials that ball up under a saw blade. As well, polycarbonate differs from Plexiglas, another trademarked material. All of these materials are related chemically, but we can obtain "true" polycarbonate from on-line sources in convenient size sheets that we can then saw and drill with woodworking tools. Simply be certain that the polycarbonate is UV protected.

The plate size will vary with the amateur band, which generally determines element size and weight. 1/4" thick material generally satisfies most upper HF requirements. Although polycarbonate is satisfactory well into the lower UHF range, many VHF and UHF beam builders prefer Delrin and other later materials for insulating plates and shapes.

To use polycarbonate plates effectively requires that we design an assembly that makes best use of their strengths. The assembly requires a variety of parts. **Table 2** provides a key to the parts that appear in the sketches in **Fig. 3** and **Fig. 4**. The plate itself is oblong, extending 6 to 12 inches along the element axis and perhaps 4 to 6 inches along the boom axis. The larger numbers, of course, apply to bands like 20 and 17, while the smaller dimensions are for 12 and 10 meters. As suggested by **Fig. 3**, the use of a longer dimension along the element axis places the element U-bolts at a larger distance to allow for assembly work at the element center.



Stainless steel U-bolts attach the element to one side of the plate, while similar U-bolts clamp the plate to the boom on the other side. I prefer the type of U-bolt that comes with a cast saddle over other types. The absence of any saddle tends to allow element slippage over time. Muffler-clamp type saddles contact the element in two lines, which can more easily deform the element tube than the solid cast saddle. In most cases, the boom U-bolts will be larger than the element U-bolts, since booms may range from about 1.25" for lighter beams to perhaps 2" for longer ones. Boom materials can be either 6063-T832 or 6061-T6. For anything

Fig. 3

heavier than a 2-element beam, it is useful to use thicker tube walls, perhaps 0.125". For smaller beams, you can nest 1.125" tubing with 0.058" walls inside 1.25" tubing with the same wall thickness. If you need a longer boom than the stock available, you may stagger the junctions of the inner and outer tubes to achieve a stronger boom with a uniform diameter.

For parasitic elements, you may use a single center element section or you may link two sections with an inner strengthening tube. Even where you do not need doubling, the inner tube should extend at least to the edges of the polycarbonate plate so that the U-bolts go around a double thickness of tubing to help avoid crushing. The driver element replaces the linking tube with a non-conductive rod or tube, such as fiberglass. The rod helps align the element and provides for the required driven element gap. Note that the gap in any antenna is a part of the total element length. It is NOT an addition to the length. The gap size is not critical, since the leads from either side of the gap to the feedline connector make up any missing length. Essentially, the final gap size is the spacing between the conductors in the feedline.

All hardware (except for U-bolt cast saddles) is stainless steel. **Fig. 4** shows an exception to this rule. The support for the coax connector consists of a short length of 1" by 1/16" thick L-stock. The length is just enough to serve as a U-bolt keeper bar. At the center, a 5/8" hole allows you to mount a through-chassis coax UHF connector. Leads to the element are short and direct. Use a "liquid" (plastic) electrical tape product to seal the coax connector rear end--and the coax junction once you install the feedline. The general ideas in these sketches permit any number of variations. Besides studying alternative techniques that appear in articles and handbooks, you may also examine various commercially made beams that you encounter. Very often, manufacturers place their assembly manuals on line for the benefit of prospective buyers and those who obtain beams second hand. These manuals are excellent sources of ideas ready for your local adaptation.

Whichever system of mounting that you use, be certain that the assembly has the quality necessary for durable service. Most beams operate at the tops of expensive towers with equally expensive rotators to direct them. The antenna itself should not be a weak link in this otherwise sturdy system.

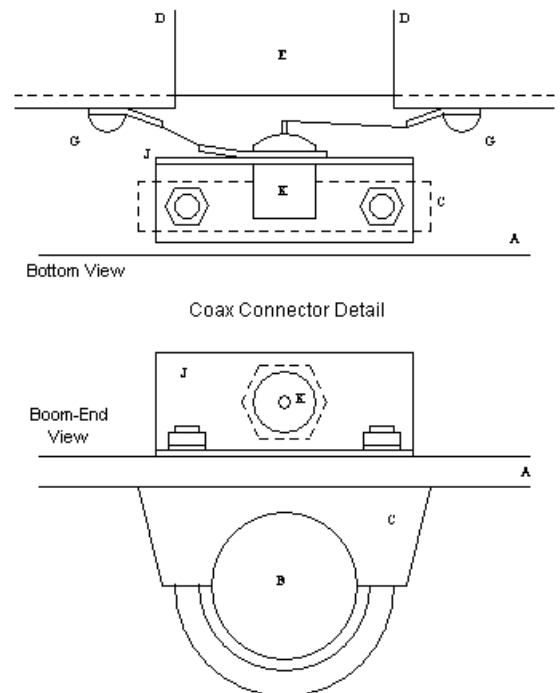


Fig. 4

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- ★ Variable Tone Control.

Famous last words

"640k ought to be enough for anybody"
 - Bill Gates 1981

"Heavier than air flying machines are impossible"
 - Lord Kelvin 1852

"This 'telephone' has too many shortcomings to be seriously considered as a means of communication. The device is inherently of no value to us"
 - Western Union internal memo. 1896

"I have traveled the length and breadth of this country and talked with the best people, and I can assure you that data processing is a fad that won't last out the year"

- Editor business books, Prentice Hall 1957

"Computers in the future may weigh no more than 1,5 tons"
 - Popular Mechanics science forecast 1949

"Man will never reach the moon regardless of all future scientific advances"
 - Dr Lee de Forest.

"The bomb will never go off. I speak as an expert in explosives"
 - Admiral W. Leahy. US Atomic Bomb Project.

"But what is it good for?"
 - Engineer at the Advanced Computing Systems Division of IBM 1968, commenting on the microchip.

TRADERS FEAR TRADE LOSS THROUGH "HAMS" SPOILING RADIO RECEPTION

RADIO traders are receiving complaints, from their customers, that amateur transmitters, in the Union, are interfering with normal programme reception by wandering from their allotted wavelengths. It is alleged that, in some cases, radio listening has been de-popularised because of this and retailers fear that, if it continues, trade will be affected.

"Every suspected case of interference ought to be reported to the G.P.O. Wireless Inspector," a Post Office official informed the ELECTRICAL AND RADIO TRADER.

He explained that, on the short wave band, amateurs were confined to wavelengths between 85.71 and 75 metres, 42.86 and 41.1 metres, 21.43 and 20.83 metres, 10.71 and 10 metres, and 5.357 and 5 metres.

Each amateur set was crystal controlled to function within these limits, and although the Post Office do not keep a check on short-wave transmissions, but the official says that he is convinced that amateurs stick faithfully to their allotted limits.

If shortwave listeners came across interference they ought to establish the "ham's" identity. "They should try to get somebody to read the call-sign in morse if they cannot do so themselves," he said.

"Listeners to S.A.B.C. programmes on the 31-metre band may hear clicking sounds because amateur transmitters are so near," he said.

"Those who switch their radios from one wavelength to another or from one band to another are quite likely to mistake the noise of the contact breaking for amateur interference."

"We don't like their sound, and guitar music is on the way out" - Decca Recording Co. rejecting the Beatles

"I think there is a world market for maybe five computers" - Thomas Watson, chairman of IBM 1943

"The wireless music box has no imaginable commercial value. Who would pay for a message sent to nobody in particular?" - David Sarnoff's associates in response to his urgings for investment in the radio in the 1920's.