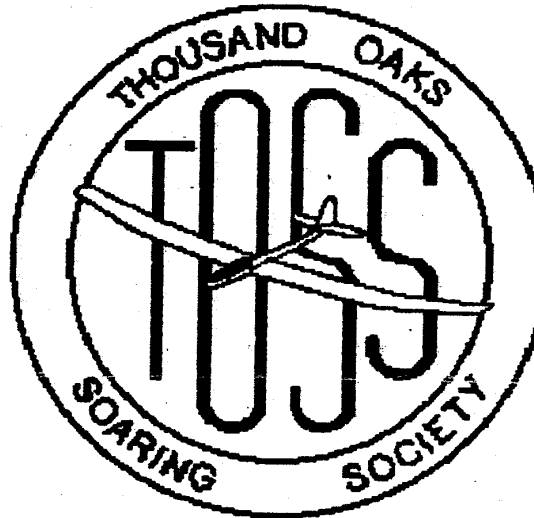


POSS-U-P



Attention:

If you would like to reach a person instead of a mail box. Write to the EDITOR

NEWSLETTER

JUNE 1989 T.O.S.S. P.O. BOX 1955 THOUSAND OAKS, CA. 91362
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Next Contest; JULY

C/D:	Art McNamee
Type:	X/C

Next Meeting: JUNE 28th 1989

Place:	Oaks Mall Next to Bullocks Hillcrest Dr. T.O.
Time	7:30 p.m.

	Last	first	phone	street	city	st. zip	frequencies
1	BORSTELMANN	CRAIG	805 498 2987	674 BLUE OAK AVE.	THOUSAND OAKS	CA. 91320 40	
2	BIZOLICH	NICK	714 854 3689	19366 SIERRA BELLO RD.	IRVINE	CA. 92715 38,40,50,56	
3	ELLIS	JOHN	805 398 5674	1961 VIA MONTECITO	CAMARILLO	CA. 93010 56	
4	GOLDSMITH	BOB	805 529 2441	12792 WINTER AVE.	MOORPARK	CA. 93021 16,24,40,48,	
5	HARTMAN	RICHARD	805 488 6136	1852 SANFORD ST	OXNARD	CA. 93033 44,46,48,52,54,56	
6	HELGESON	DENNIS	818 705 4872	6545 WILBER AVE.	RESEDA	CA. 91335 doesn't want to tell	
7	HENDRICKSON	ERIC	805 493 4210	2486 CHAUDER PL.	THOUSAND OAKS	CA. 91362 26,30,48,50,54,56	
8	HOLLOWAY	GREG	805 483 8170	1833 IRES AVE. #162	OXNARD	CA. 93033 48,50	
9	KOPLAN	TERRY	818 889 6984	30434 W. RAINBOW CREST DR.	AGOURA HILLS	CA. 91301 40	
10	LINDGREN	RON	805 523 1577	6421 CORNELL CIR.	MOORPARK	CA. 93021 48,52,56	
11	MONTYRE	TODD	805 482 2841	2417 LA SIERRA CT.	CAMARILLO	CA. 93010 38	
12	MONAYEE	ART	818 362 2822	14950 YOUNGDALE PL.	SAN FERNANDO	CA. 91342 53,0	
13	MONAYEE	DON	805 526 3145	2291 N. HIETTER	SIMI VALLEY	CA. 93063 46,50,54	
14	MEREDITH	WAYNE	805 497 1297	1261 TIERRA.	THOUSAND OAKS	CA. 91362 doesn't want to tell	
15	MESSING	JOE	805 527 1940	6482 MELIA ST	SIMI VALLEY	CA. 93063 40,44,46,50	
16	MICHTSCH	GURR	818 991 0666	6012 COLDONY DR.	AGOURA HILLS	CA. 91301 40,44,46,48,	
17	MICHTSEH	ROBERT	818 991 0666	6012 COLDONY DR.	AGOURA HILLS	CA. 91301 40,44,46,48	
18	MORAN	MYLES	818 882 4687	10428 OSO AVE.	CHATSWORTH	CA. 91311 16,18,20,24,28,32,34,48,52,54	
19	MORGAN	RALPH	805 484 7728	2120 GORMAN STREET	CAMARILLO	CA. 93010 doesn't want to tell	
20	MOVRY	BRUCE	805 985 7032	2700 PENINSULA RD. #253	OXNARD	CA. 93035 42,46,50,56	
21	NIBLEY	BILL	805 526 6754	2106 LATHAM ST.	SIMI VALLEY	CA. 93065 44	
22	NORTHERN	DON	805 523 1018	3977 WILLOWCREEK Ln.	MOORPARK	CA. 93021 doesn't want to tell	
23	OLDENBURG	ED	805 497 7463	951 WARWICK AVE. #A2	THOUSAND OAKS	CA. 91360 53,3	
24	ONSTAD	BOB		P.O. BOX 287	HATFIELD	AR. 71947	
25	SCHOLL	DON	805 484 3233	1537 PRIMA CT.	CAMARILLO	CA. 93010 doesn't want to tell	
26	SWAIN	DAVID	805 485 9990	728 ERICA PL.	OXNARD	CA. 93030 44,48,54	
27	SVET	BOB	805 388 9619	2600 PONDEROSA DR. APT.15	CAMARILLO	CA. 93010 42,54	
28	VAN HAMERSVELD	JOHN	805 492 5904	2826 N MARIETTA CIRCLE	THOUSAND OAKS	CA. 91360 40,50,56	
29	WEISMAN	EDGAR	805 496 0611	752 CAMINO VALLES	THOUSAND OAKS	CA. 91360 52,56	
30	WIECHERT	JIM	805 526 3327	1791 GLENVIEW AVE	SIMI VALLEY	CA. 93063 doesn't want to tell	
31	WILLS	BEN	805 496 7404	196 QUALS TRAIL	THOUSAND OAKS	CA. 91361 22	
32	WOOLSEY	BEVERLY	818 991 2544	5892 CAPE HORN DR	AGOURA	CA. 91301 doesn't want to tell	
33	WURTS	JOE, JAN	805 284 8525	23327 AVENIDA RONADA	VALENCIA	CA. 91355 16,20,46	
34	ZANMEISTER	CHRIS	805 484 9586	1594 VIA LA SILVA	CAMARILLO	CA. 93010 52	



Eric's Blurb

It is amazing how much has happened in the last month. The big NEWS flash is Joe Wurts just got back from Chicago's Great race and gave those boys back East a lesson on flying X-Country. I LOVE it. I've read an awful lot in the different magazines about how the thermals aren't as strong, the planes have to be different and so on. Well Joe took his bagged 374 back and on Saturday's first run finished the course in 1:38. Folks this is a 43 mile course, flying distance is some what less but still quite an accomplishment. Well, it seems it was a little quicker than they could believe so Joe launched again and with two other cars following him to make sure he was really flying the course he did it in 1:22. Needless to say it raised a few eyebrows considering the 13 year record was 2:15. Welcome to the 20th Century for the people back East. On Sunday Joe arrived at the field and was informed there was no lift. It was also windy with the first leg 13 miles upwind. Apparently only two teams launched at close to noon and attempted the course, which had to be completed by 3 pm. Well at three o'clock Joe was back having his well deserved tall cool one and the only other team was at the 30 mile mark. CONGRATULATIONS, Joe. I guess he invited them all out to fly in the real Great race at Taft but rumor has it they are looking for Vacuum pumps, fiberglass and hot wire equipment, not to mention trying to swallow a whole bunch of crow. Those are the highlights of his trip and when I talked to him Wednesday he was still grinning from ear to ear.

From the good to the bad. I am flying (at my real job) with the owner of our field this month and our field was put in escrow this past week. We may be able to still use part of the land

to the East but I'm not counting on it. The bottom line is EVERYONE in the club has to help out. I would like EVERYONE to give me at least one possible location to fly on. Preferably an address along with the owner's name. Better yet, spend a day researching one or two pieces of property. I spent a lot of time finding this last field and I will be quite honest I am having to work more and don't have the time to spend locating another one but we have two things working for us now.

One we have time to find a field and second we have a lot bigger club and if EVERYONE helps out we will find a new site quickly before we are asked to leave our present site. You have no right to belly-ache about the new site if you don't help finding it. My number is on the cover of this newsletter, pick up the phone and communicate. I will need some HELP on this one.

I am in the process of building a X-C using a

new carbon fiber cloth. Boy is it easy to work with and the results are excellent. I'll bring a sample of the raw materials and finished product to the next meeting I get to. I also used that new UFO glue Bob Hunter (Satellite City) makes. If you haven't tried it, get a bottle. It works beautifully on foam, you can bond anything to foam including itself, use accelerator and no foam is eaten away. Plus it doesn't have that noxious odor the other stuff has. This is a must if you use foam in construction.

About our meetings, I personally think the meetings should be limited to 30 minutes of club business and the rest to demos, show and tell and the like. I am getting sick of sitting around the table discussing items that quite frankly can be taken care of elsewhere. You have club officers and we all have phones, lets use them so the meetings aren't filled with hours of long winded discussing. If you don't like the way something is being handled get involved and either call an officer or volunteer and do it

Joe launched again and with two other cars following him to make sure he was really flying the course -- he did it in 1:22.



yourself.

With that off my chest, the August meeting will have a demonstration by Art on Monokoting at 8 pm. All business will be handled by then or it wasn't worth talking about in the first place. The September meeting I will demonstrate the new Vision radio by Airtronics. If you haven't seen this beauty up close I'd recommend attending and not buying anything till then. And there will be more at future meetings.

We have a lot of new people, get involved you will have more fun. I'd like to thank Art for making sure the Club winch is at the field week-end after weekend. This is a thankless, pain in the neck job but Art has been dedicated making sure it is always working properly. If you haven't been checked out on the equipment ask someone and if you have knitted a sweater also ask because there is more to operating it than standing on the button to make it go. With proper use the winch and retriever will go all day with no tangles.

Thank you Greg Helleway for the new barbed wire for the gate.

The first night fly of the year went off with out a hitch. Lots of first-timers out plus the old hats. As usual the Joe Wurts of Night Flies (Don Northern) blew everyone away flying 14.5 minutes in the three rounds. Dave Swain provided the entertainment by wrapping Chuck's Wanderer around Bob Goldsmith mirror on his truck. Some of us had to overcome heavy, smelly odds just to get off the ground. Thanks to everyone who brought food, drink, BBQ and the rest to the field. I'd mention names but with my luck I'd forget someone important. Remember we are repeating the whole thing in September. I guarantee a good time. Get yourself a floater you can build it in a couple of days.

My final comment comes from a tip

Myles gave me. The J series Futaba servo plugs will work in Airtronics receivers with just a slight modification. The Futaba has the Red lead in the center and the black lead on one side. These two have to be switched so the black is in the center and the red is where the black lead

The J series Futaba servo plugs will work in Airtronics receivers with just a slight modification.

was. This can be accomplished with no soldering by using a T-pin to carefully pry up the plastic clip holding the metal connector in place and swapping the two places. Next take a file and remove the alignment tang on the Futaba servo connector so it now looks like a box and there you have it. It plugs right into any Airtronics receiver. The

last thing I did was take some red paint and paint a stripe on the receiver where the red lead goes as it is possible to plug the lead in backwards with no alignment pin. Pretty neat way to convert servos.

Remember our X-C is July 7, 8 and 9th. Any help on any day is appreciated. To make this event successful we need club member support.

Eric

CAD's For the Year

Jan 7th	Wagne Meridith
Feb 11th	Don McNamee
Mar 11th	Bob Goldsmith
Apr 8th	Eric Hendrickson
May 13th	Art McNamee
Jun 10th	Myles Moran
Jul 8th	Chuck Griswold
Aug 12th	Ed Oldenburg
Sept 9th	Bob Onstad
Oct 14th	Richard Hartman
Nov 11th	Ralph Morgan
Dec 9th	Don Northern



Electrical Q&A

Some club members may have questions regarding electricity. What is it? What is an ampere, volt, ohm or resistance? Any small (or large) question that you would like to know about but were afraid to ask; now is the time. You can be anonymous, or you can let the club know that you don't know and aren't afraid to ask.

Call them in to Chuck or write to me, Art McNamee, I will give them all the attention that they deserve. Even if you read the Electronics page in Model Aviation and make sense out of it, you might not understand the whole article. Ask about the part that you don't understand.

Let's start with a few basics on electricity. All matter is made of atoms. Atoms are like our solar system. The nucleus, our sun, and the electrons, the planets. The nucleus is made up of neutrons, (neutral) and protons, (positive polarity). The electrons have a negative polarity. In a good conductor, like copper, the outer electron like the outer most planet in our example, is loosely bound or attracted to the nucleus. It may break free of its orbit and wander around causing another electron to move from its orbit. The first electron will then take the orbit of the second electron etc. This random drift can be controlled and made to behave in a useful way. The flow of electrons in a circuit is called current flow and is measured in amperes. An ampere is 6.25×10^{18} electrons (That's 625 with 16 zeros after it.) flowing past a point in a circuit in one second. Call them Amps for short. A volt is the electrical pressure needed to push one amp through one ohm of resistance. An ohm is a unit of resistance or opposition to current flow.

In a battery powered circuit, the electrons or current flow in one direction, it's called a direct current (D.C.) circuit. In a D.C. circuit current

flows from negative (-) to positive (+). This never changes. Inside the battery electrons migrate through the battery from the positive terminal to the negative terminal to resume their journey. (More on batteries later if anyone is interested) In electricity, as in magnetism, like charges repel and unlike charges, or poles in a magnet, attract each other. Electrons (neg) are attracted to the positive terminal of the battery

externally. In electricity the units used such as volts, ohms, amps, capacitance or power can be measured in very large or very small numbers or amounts. Here's how.

"I'm a new flyer on a tight budget what kind of radio should I buy"

- 1 Meg. (Mega) = 1,000,000
- 1 K (Kilo) = 1,000
- 1 = 1
- 1 Mil = .001
- 1 Micro = .000,001

Now we can explore transmitters, receivers (am, fm, pcm) antennas ac or dc circuits. You name it, just let Chuck or myself know the questions, you will get the answers. I don't want to write about something that no one is interested in.

Art McNamee

"Hey! and here's your first question, Art."
"drum roll (rrrrrrrrrr)"

"My Dearest Art - Watts the meaning of life? Please write back. I think I'm in love"
Confused in Camarillo

Now if that doesn't keep him busy for awhile here are a few more from a new R/C pilot.

"I'm a new flyer on a tight budget what kind of radio should I buy, with all this talk about AM FM double tuned, I can't make up my mind. Should I



wait until the new frequencies are out or is one as good as another? How come FM is more expensive than AM and what makes it less sensitive to noise? If I buy a single tuned FM would it be as good as a double tuned AM receiver? In your opinion who makes the best R/C radio? and Why? I saw a R/C flyer using what looked like a short walkie talkie antenna on his transmitter. If I bought a transmitter like that could I use a very short receiver antenna, to keep it in the airplane? If I start to loose my plane what is the best way to orientate the transmitter antenna? Do batteries have a memory? What are the best batteries to buy? My battery won't fit in the nose of my brand new plane and I would like to change the shape of the pack, how do I do it? How do you wire up a battery pack and keep them together?"

And from a more experienced flyer
 "Why does carbon fiber seem to effect one radio and not another? Are there any other materials that we use in building that might effect the signal? What is the best way to keep the signal as strong as possible?"

From another experienced flyer
 "What is all this about RF, IF, and TV channel 4? Any connection?"

Don't panic if your question isn't answered in the next letter. It might take Art a while to answer these. I think there is a definite need for a electronics Q&A column. I'm sure that Art will answer these in a professional way. Giving specific answers where he can. Thanks Art, I for one am impressed.

Chuck

I'M THE GUY

I'm the guy who was invited to join your organization. I'm the guy who wanted to learn to fly radio controlled planes. I'm the guy who went out and purchased a Gentle Lady and a 1991 legal radio.

I'm the guy who came to your meetings, and no one paid attention. I tried to be friendly to some of the members, but they all had their own buddies to talk to and be with. I'm the guy who came to the field and tried my best but no one seemed to have time to work with me and help me become a better flier.

I missed a meeting because I was sick and couldn't be there. No one called, or asked me at the next meeting where I had been. I guess it didn't matter very much to the others whether I was there or not.

The next meeting I stayed home and watched TV. At the following meeting I attended, no one asked where I was at the previous meeting.

You might say I'm a good guy, a good family man who holds a responsible job, loves his community and country.

You know who else I am?? I'M THE GUY WHO NEYER CAME BACK....

I've been out on occasion when Art Mc-Namee Eric Hendrickson or Bob Goldsmith were running winches and helping new-comers. Let's keep up the good work, and if you have a day off, come out to the field with the idea to just help someone out, if no one new shows up that needs help- nothing lost. We have a lot of new members this year. Let's not let them get away.

You know it's going to be a bad day when, the thermal that you have just hooked, happens to be with a plane that some else is flying.

Chuck

MYLES SAYS!
 REMEMBER: SC² AT SOLA JUNE 28TH -- THIS SUNDAY --
 THE NEW MALIBU CLUB HAS INVITED US TO JOIN THEM AT THEIR NEXT CONTEST. LETS GET IT TOGETHER.
 PAGE 5



THOUSAND OAKS SOARING SOCIETY
MINUTES OF MAY 31, 1989
REGULAR MEETING No. 5

There were nine members present and one guest, Todd McIntyre.

Eric Hendrickson called the meeting to order at 7:30 PM.

The Minutes of the last meeting were read and accepted.

OLD BUSINESS

Had discussion of needs for Nite Fly, June 10, specifically bar-b-que equipment, chem lites and Hi-starts. AMA sanction is required for the TOSS-hosted SCSC contest to be held in August. X-Country discussion was held for ten minutes for benefit of new members and guests. 10 teams have signed up with 2 coming from England again this year.

NEW BUSINESS

NSS Soar-In will be held sometime in October or November or December, 1989.

NSS Masters Event will be held in April, 1990, with Myles Moran as C/D again. Short discussion was held concerning future qualifications of entrants with emphasis being given to the lessening of stringencies.

There will be a sign-up at the regular meeting of June 28, 1989 for helpers and timers needed for the July X-Country event.

The membership voted upon affirmatively to allow a \$1.00 entrant fee to anyone 16 years old and younger at a regular TOSS monthly contest.

Art McNamee will demonstrate his technique of bubble-less and ripple-less monokote application at the regular August 30, 1989 TOSS meeting.

The meeting adjourned at 8:45 PM, the raffle was held and Art McNamee won the dremel tool.

Ed Oldenburg



League of Silent Flight

P.O. Box 647
Mundelein, Illinois 60060 USA

To: LSF Executive Board
P.O. Box 647
Mundelein, Illinois 60060

I, _____ (please print), will support the philosophies, concepts and criteria set forth in the By laws of THE LEAGUE OF SILENT FLIGHT and give notice herewith of intention to attain Level I of the LSF Soaring Accomplishments Program, and by so doing earn full recognition and privilege of membership.

(Signature)

Mailing Address: _____

AMA (or other FAI Affiliate) Licence or Membership No. _____

Note: ALL CORRESPONDENCE TO THE LSF MUST INCLUDE AT LEAST \$1.00 IN US STAMPS OR CHECK /M.O. FOR POSTAGE



CARBON vs STEEL WING RODS.

BOB BAYARD S.B.S.S.

This is an unplanned follow-on to the work on wing spar strength that Reinhard Lahde and I reported recently in the Silent Flyer. It began at our March contest when I noticed a fellow hammering a wing rod out of his fuselage. He said it was the second one that had bent. What was the material?

The drill rod was sold as being water hardened but it clearly wasn't hardened.

Drill rod, from Orchard Supply. I decided to investigate that material as well as carbon fiber and the more commonly used music wire wing rods. Having done that I began wondering if usual wing rod arrangements could take the king of forces Reinhard and I showed could be taken by come carbon fiber spars, so I looked into that too.

Wing Rod Strengths

To measure comparative strength of wing rod material I used the same apparatus Reinhard and I had used in the wing spar study. This test setup gives force readings which are equal to the tow line forces which would exist on a two-meter model with typical tapered planform. The test rods were 1/4" dia. and were supported by 1/4" ID by 4' long pieces of brass tubing epoxied into pieces of wood. To determine relative strength I would put a rod in the setup and put a force of say 20 lbs. on the "tow line," remove it and see if a 4' piece of the brass tubing would still slip over its length. The different measurements showed that a rod bent less than about a quarter of a degree (1/64" in about 4" length) would let the tubing slide past the bend, but that a bend of half of a degree was too much. Each time the rod was put in the apparatus the force was increased by 5 lbs. until it wouldn't let the

tubing slip over it any more. I counted the strength of a sample as the maximum "towline" force that didn't bend the rod beyond the point where the tubing would slip over it afterward.

The drill rod was sold as being water hardened but it clearly wasn't hardened. A hacksaw cut it easily. Its strength was only 25 lbs. No wonder the fellow at the contest found them bent after launching.

I took another piece of drill rod and hardened it by heating it cherry red and quenching it

in water without annealing it. At a "towline" force of 50 lbs. it broke, a very brittle fracture. Another piece I hardened and then annealed. I may have annealed it at a bit too high a temperature—its color is supposed to be gun-metal blue but it went a trace past that. It bent rather than breaking but its strength was exactly the same as the fully hardened piece, namely 50 lbs.

A piece of music wire was also tested. This material can't be hacksawed, at least with only one blade. Its strength was the best of the steel pieces, 75 lbs.

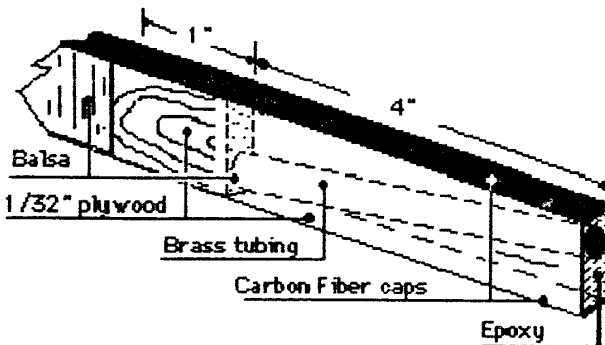
I also tested a solid carbon fiber rod obtained from Aerospace Composite Products (Box 16621, Irvine, CA. 92714). I had heard that carbon fiber was more than twice as strong as a similar sized piece of steel. If true, this would tax the test apparatus. However it isn't true. My first sample went to 40 lbs. without incident but at 45 lbs. it failed. The failure was in compression of the fibers at the top of the rod, the place of maximum compression stress. To see if it was a fluke, I broke two more samples. They failed at about the same force, one failing just like the first one and the other by breaking in half.

So, carbon fiber is not stronger than steel on an equal size basis. How about an equal



weight basis? My crude measurements showed steel to be nearly five times as heavy per volume as carbon fiber. So a reasonable comparison between carbon fiber and steel might be a carbon fiber rod 1/2" in diameter vs. a 1/4" steel rod. (The 1/2" carbon fiber rod would be four times as heavy as the 1/4" one and it would have twice as much brass tubing as the 1/4" rod, so the weight comparison between 1/2" carbon fiber and 1/4" steel should be very close). Assuming the theoretical ratio of rod strength as a function of different size rods, namely the cube of the diameter, this carbon fiber rod should be eight times as strong as a 1/4" diameter carbon fiber rod, or about 360 pounds. This is clearly overkill, as the rest of the system—the tow line, the brass tubing, the balsa/foam, etc. —would probably fail in all sorts of ways before reaching that force. A more reasonable comparison might be a 3/8" diameter carbon fiber rod against a 1/4" steel rod. Again using the cube relationship between diameter and strength, this carbon fiber rod should tolerate a tow line pull of about 150 pounds. This is twice as strong as the 1/4" steel rod and yet the 3/8" carbon fiber rod would weigh less than half as much as the 1/4" steel rod. The difference in weight for a typical wing rod setup would be about one ounce. Of course the carbon fiber would cost a lot more— \$11 for a one-foot length versus \$2 for a three foot length of music wire.

SKETCH



To see if a typical wing rod construction would tolerate the kind of forces Reinhard and I were able to develop in carbon fiber spars, I took our best sample spar and built a wing rod box at one end. The sample was 5/8" high and had a 1/4" thick vertical grain balsa shear web, a .031" thick carbon fiber lower spar cap and an .080 thick upper spar cap, both caps being 1/4" wide.

The wing rod box was very simple (see sketch). The balsa shear web stopped 4" from the end of the carbon fiber caps. A piece of 1/32" plywood was glued to each side of the spar over those last four inches and continued over the sides of the balsa shear web for an additional inch. A 4" length of the brass tubing was inserted between the two pieces of plywood and the empty spaces around it filled with epoxy.

With a music wire rod carrying the load, this sample took 70 lbs. without incident. At about 80 lbs. it gave away. The failure was the same sort (and at the same force on the "tow-line") that Reinhard and I had found for the equivalent carbon fiber spar, namely, shear web failure and upper spar cap buckling. Although the music wire rod had bent to nearly a four degree angle, the wing rod box assembly was completely unharmed!!

Summary

The best steel rod is music wire. If you are a competent metallurgist and could properly temper a piece of drill rod it might come up equal to music wire, but why bother?

A carbon fiber rod having the same diameter as a music wire rod is only about half as strong. A carbon fiber rod with twice the diameter would weigh about the same as the steel rod but would be outlandishly strong. A more reasonable comparison would be a carbon fiber rod that is half again as big in diameter as the music wire rod. This carbon fiber rod would weigh less than half as much as the steel (saving an ounce in a typical design) and yet be twice as strong.



A simple wing rod box with 1/32" plywood sides extending 1" beyond the 4" long box space and the box space filled with epoxy is more than adequate to take all that a very strong carbon fiber spar can tolerate.

Bob Bayard

ed: A couple of interesting things to look over here. 1) Good old music wire could be the hot setup. 2) Notice where the spar failed. How about wrapping something around the balsa shear web and the carbon fiber so they wouldn't separate? Maybe you don't need to laminate the carbon fiber to a spruce spar.

Chuck

NORMALIZED TOSS CONTEST FOR JUNE

Max score JUN 3000
Highest T.O.S.S. score JUN 2940

#	NAME	CLUB	TOTAL	JAN	FEB	MAR	APR	MAY	JUN
1	HENDRICKSON	TOSS	5875	973	969	983	969	996	986
2	HARTMAN	TOSS	5257	804	938	882	907	817	909
3	WURTS	TOSS	4994	996	997	1000	1000	1000	0
4	WEISMAN	TOSS	4703	676	978	523	780	911	835
5	NORTHERN	TOSS	4692	898	993	0	961	865	975
6	OLDENBURG	TOSS	4669	0	1000	871	917	884	997
7	GRISWOLD	TOSS	4583	907	0	934	952	795	996
8	MORAN	TOSS	3822	958	919	979	0	965	0
9	GOLDSMITH	TOSS	3699	792	0	418	865	682	942
10	MORGAN	TOSS	3538	932	915	0	0	782	909
11	SWAIN	TOSS	3299	0	928	0	623	884	866
12	KOPLAN	TOSS	2947	0	0	0	986	961	1000
13	LINDGREN	TOSS	2769	0	0	846	951	0	972
14	VICKERS	PSS	2753	886	919	948	0	0	0
15	McNAMEE A.	TOSS	1909	946	0	0	963	0	0
16	MEREDITH	TOSS	1721	876	845	0	0	0	0
17	HOLLOWAY	TOSS	1291	0	490	367	434	0	0
18	SIREN	PSS	1000	1000	0	0	0	0	0
19	HINMAN	TOSS	934	0	0	0	934	0	0
20	McNAMEE D.	TOSS	902	0	0	0	902	0	0
21	ONSTAD	TOSS	895	895	0	0	0	0	0
22	DOUGLAS	SWSA	823	0	0	823	0	0	0
23	JOHN VAN H.	TOSS	788	442	0	346	0	0	0
24	SWET	TOSS	590	0	0	0	0	0	590

**2 METER CONTEST
NORMALIZED TO 1000**

	NAME	CLUB	TOTAL	JAN	FEB	MAR	APR	MAY	JUN
1	HENDRICKSON	TOSS	5798	911	968	1000	952	966	1000
2	WURTS	TOSS	4969	1000	990	978	1000	1000	0
3	OLDENBURG	TOSS	3443	0	1000	969	746	728	0
4	HOLLOWAY	TOSS	2418	0	0	534	917	0	966
5	GRISWOLD	TOSS	1834	0	0	0	0	890	943
6	JOHN VAN H.	TOSS	1392	546	0	361	485	0	0
7	McNAMEE A.	TOSS	922	0	0	0	922	0	0
8	MORAN	TOSS	916	0	0	916	0	0	0
9	MERIDITH	TOSS	887	0	887	0	0	0	0