INTRODUCTION

Wow what an eclectic issue. Thanks to the new and old authors, I think you will enjoy and possibly learn something about our hobby, from this issue.

I asked the president of the MWC for an article but Bryan said he was already feeling guilty about not sending "Task Force 1:144" articles, and if he sent Hull Busters an article, the task force editor would be on his case. Well, OK, still, I hope to see the new club continue to support Hull Busters in a big way in the future.

The next issue, April's issue is the most difficult to fill, and I have used every article I have, so please consider sending an article as soon as possible, thanks in advance!

Well, get your flashlight, and sneak into your closet where you can enjoy this Buster without tarnishing your reputation!

Fluegel needs a room mate for MWC NATS!

My dear friend Bart, has a better offer than me for his roommate at Nats, his son Matt (such a porkchop looser!). I understand that family comes first, so I guess I will just have to stay with Matt's girl friend as a room mate...well, that might be ... problematic. I need a new roommate! Perhaps a rookie, or second year Allie, not from the Texas area and not too late of a night owl. I feel like this is some kind of classified ad for a date...odd. Still, I like to discover new friends and by rooming with some new combatants, I have made some great friends. Contact Fluegel7@juno.com and let the friendship begin!

The IRCWCC and you

Marty Hayes
President of the IRCWCC

Well, it is the beginning of another year, and everyone is busy in their workshops hoping this year to bring forth the ultimate fighting ship. Nationals this year will at the War Memorial Park in Johnston, R.I. I hope to see you all there. There are many interesting places to visit nearby, and the week should be so full, that no one should go home without being dead tired.

The Allied fleet needs to be actively recruiting this year, since its rolls were down at the beginning of the last Nationals. We are expecting elements of the far Northern Fleet (NABS) to attend Nats this year. From what pictures we have seen, this should be a real visual treat for the rest of us! This will also be a chance for them to move from the small pond of battle up the Nationals level and size and give them a unique experience. Often we think we have a feel for the game when we battle in our small and separate battles locally, but there is an extra feeling and spirit that emerges when we finally get to battle with the other widely separated battlers at a large event. Hopefully, they will have some extra special experience and tactics to return with.

As you read this, an event will have taken place, which marks a special place in R/C, combat, the South Orange Model show. Elements from NY, NJ and Maryland will attend with their models and some videotapes in an attempt to bring the joys of R/C combat to the unwashed masses. Locally, we have done this numerous times with good results. So, let me mention to all R/C combatants that this is a good move on the part of the local clubs. Make friends with the other modeling types in the neighborhood, you would be surprised what you have in common. Of course, they will be astounded at the fact that we "destroy" our ships in the game of combat, but after that they will be very interested in our game. So it is worth your time to be visible and outgoing, and can add to your membership. Attend a hobby show, visit the nearest precision steering event, and talk to the model airplane people.

Let me take a moment to invite all combatants to attend our regionals, Nationals, etc. We are happy to provide the facilities and fellowship to all.

Gentlemen

I am pleased to announce the "third" and what may be the final **Fray @ Bray's event.** Many of you have voted and the date is April 28th and 29th. The cost is $10.00 per battler. CO2 is provided. Please e-mail me privately if you plan to attend. Please send payment to the below address:

Kevin Bray
12724 East 89th Street North
Owasso, OK 74055

Thanks,

Kevin

Exotic Toys

Phill Lowe, Washington Cascade Column

Though there are a wide variety of opinions as to what equipment and tools are needed to run combat ships, many things are generally accepted as necessary. One of these is a digital Volt Ohm Meter (VOM). The precision of the digital meters makes a big difference when testing voltage levels for receivers and for determining the state of gel cell batteries. Keith Maxwell found a shirt pocket sized model for $10 on ebay.

What is not on anyone's required list is the Radio Shack 22-805 VOM. This is the top end model that Radio Shack carries though other sources have more exotic and expensive models. At about $70 it isn't the kind of equipment you want to drop into the lake!

The 22-805 does have a feature that most other models lack. On the top is a small cover that hides a 9 pin serial port. A serial cable and floppy disk containing software come with meter.

I suppose some background is needed to explain why I started playing around with this meter. My original cruiser ran on NiCad batteries and so I put them in my son's Monitor too. I then built a battleship (Richelieu) and went to dual 12ah gel cell batteries. After using the gel cells for a while and really liking them, I decided to refit the Monitor with Gel cells. Then I built a Liberty ship for combat play and put a 7ah gel cell battery in it. This is the same battery that most of the rest of the club is using for cruisers and in pairs in the Warspite.

Suddenly, instead of reliable power, I had dead gel cells left and right. But not all of them, just the 7ah batteries. The 2.5's for the monitor and the 12ah for the battleship continued to behave quite well. So what the heck is going on? I gave a couple of them to other people to charge and when I got them back they worked fine. Hmmmmm That means it has to be something I am doing!

I get paid to annoy computers, so when I found a VOM that I could hook up to the computer I knew I could get answers. I dug out the old 286 laptop and hooked it all up to my normal charging system. I told the computer to query the VOM every five minutes and write the time and voltage to the disk. I then proceeded to charge four batteries in the normal fashion. After they were done I looked at the logs that the computer had created during charging. There in a very simple list of numbers was the answer that had eluded me.

My charging system works fine for 12ah batteries because they need more power and therefore take longer to charge. The 7ah batteries were reaching full charge in much less time but then were being overcharged. The natural reaction to seeming low power is to charge the batteries longer which is exactly the wrong answer. I hadn't stopped to consider that I was charging the 2.5ah batteries on a different (much smaller) charger so they needed about the same amount of time to charge as the 12ah batteries on the larger charger.

There was an article on gel cell performance over the life of a battery a year or so back that basically told you to graph the voltage of your batteries under load every 15 minutes (during a 90 minute period). While I liked the idea of getting a discharge curve, the very though of doing this to each of the dozen or so batteries in the fleet was too much. Automatic logging makes this pretty painless.

If you feel the need or this makes sense at the club level, I would recommend the RS 22-805 VOM and would be happy to send you a copy of the program I wrote that logs charging/discharging. Enjoy battling and may you have at least one fewer frustration in getting your ship on the water.

My Early Years in IRCWCC

By Don Fisher

Now that I have been in the hobby for over ten years and attended a few NATS, I have found that I have a history and every once in a while someone wants to know how you got into this wonderful obsession. At every event that I have attended, both regionals and NATS, there seems to be a time where talk gets around to one past event or another. Sometimes it's a story of some guy who used to be in the hobby or some funny happening that gets better and better with each telling. And of course several people have different versions of what really happened. The new people seem to enjoy knowing that our hobby has a history. Well, here is how I got into this and my early years with some side trips into related areas.

Sometime in 1989 I saw a Skunkworks advertisement in a model magazine. Yes, for those who were not there Swampworks was originally Skunkworks but had some conflict on using that name and I think it worked out better for Steve because Swampy works better then Skunky. I tried to talk my brother into getting one of his kits but I ended up doing it myself. My brother was into R/C aircraft at the time and I was building plank on frame sailing ship models from scratch plus R/C sailboat racing (AMYA). At the time our local club had two divisions, one for sailing and one for power. I ordered my first boat, HMS Exeter, which I still have and I found myself in both the sailing and power groups in the club. I met another guy building an R/C combat boat. Cliff (the mailman, yes he still is a mailman) Holmes who had a Adm. Hipper. Of course we had a hard time with several people in the power club and weren't able to use their ponds. They couldn't comprehend that we didn't destroy a boat each time out. Of course there were others who are still fascinated with our hobby and always wanted to see videos or watch a local event. Hopefully they will come by NATS 2001 in Johnston, Rhode Island. Cliff had battled down in MAG country at a regional and as a rookie he had gotten the usual initiation treatment and was raped in his first battle. Cliff and I battled a lot on Lake Archer in front of my home and sent each other official looking military commendations for our actions. The next year I got a set of plans from Jeff Poindexter for the USS Houston and built that boat in wood. Cliff built a Lutzow and we now had two boats each and would find friends to play with the four boats. The next year we found two more people to build boats. Jon Ether built a beautiful model of USS Massachusetts and Cliff built an I boat. I got a set of plans for the Queen Elizabeth and built one of those which I called Barham. I chose that name because no one else who had QE's had used it at the time. The name became a sign of what was to come since the Barham was the only one of the five QE class battleships to get sunk in combat. We were still using Freon at the time I had small motors, two small pumps and only three guns. Cliff and I went to regionals that year at the swamp near Annapolis that MAG used to use. The tri-pact was in full operation (for those who were not there, the tri-pact was three almost identical German battlecruisers, Derfflingers captained by Frank, Nathan, and Mike plus Will and his Nagato). This group cornered me and I sank in every sortee with over 100 hits with as many as 20 belows. Cliff was having his problems and I have a great series of photos of his I boat sinking. That was also the year that at our lunch break Cliff was testing his boat and it just sunk. Everyone was sitting around eating lunch and there was Cliff up to his stomach looking for his boat. We located it by firing his guns and seeing the bubbles come up. That year the Gypsy Moth Catrpillars were going crazy and my hull was full of caterpillar droppings, I learned the hard way that when you have a lot of debris in the hull, like pieces of balsa wood or excrement from caterpillars you need to check and clean the screen on your pump. You then have to make sure that you have reattached the hose to the outlet so your pump doesn't just circulate the water inside your hull. I had a great time and knew that this was something I wanted to keep doing and get better at, or at least try.

The following year we changed to CO2 and I built a second QE hull and named the new boat Valiant. Cliff and our fourth active member (an active member is someone who has a boat which is hopefully operationable) Dan Leinenbach built similar boats together, a Molike and a Seydlitz. When I say they built then together it's not quite accurate because Dan's ability to build was limited and Cliff really built both boats and did a very good job. The three of us went to Northeast Regionals that year. We tried to get Jon to join us with his Massachusetts but he was always afraid of getting it shot up. His superstructure was very nicely done but vulnerable to damage. I told him he should build a second superstructure for combat. I've seen a lot of really nicely done superstructure that hold up to combat without damage. It just takes time, so you either have to spend the time later to patch or rebuild the superstructure or build it BB resistant in the first place. My new Valiant had larger motors and one larger pump and four guns. I did much better and only sunk half the time. I was always trying to see what other boats were like as to gun arrangement, pumps and electrical systems. I didn't have access to the internet then so your ability to ask questions of much more experienced battlers was limited to trips to the pond.

Cliff gave up RC combat for other interests. Jon, who was 18 years old at the time found other interests like music and women and Dan had to move to the US Virgin Islands for his job with the government. He had just purchased a Bismark fiberglass hull from Swampy. With his limited building skills I wonder what happened to that hull. I still had my boats but no one local to play with. I didn't attend NATS at this time because it was always the same week as my seven day bike trip for the American Diabetes Society. I had a great time with those friends I made during those bicycling trips and still get together for bike trips with them. There were a couple of years with little or no combat but then along came a guy name John Bacon and a lot of new friends and active things started again but that's a story for another time.

Not an old photo of Don, but and old photo of Will Montgomery. 1991?

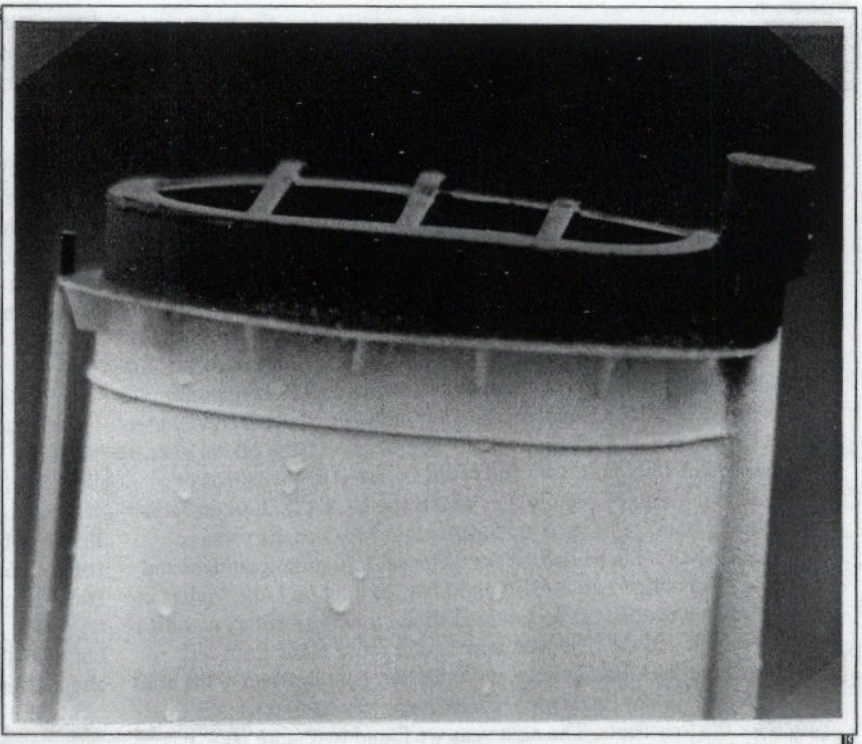
HOW DOES YOUR SHIP STACK UP?

by Steve Reichenbach

I've come across a really great way to make a realistic looking stack. Step by step, here's how it's done...

1) Using balsa, create the base of the funnel. To do this, you want two ovals, about a quarter inch thick. One oval is about a quarter inch narrower and shorter than the other, to fit on top of the larger oval. See Fig 1, balsa base.

2) The next step is to use 010 styrene or 010 lexan to sheet the lower balsa base. This gives it a smooth metal looking finish. The upper balsa base can be sheeted with HO scale chain link fencing, for a grate appearance. I like to paint the lower base the color of the ship's superstructure, and the upper base grate a dark grey. I leave the top of the upper base unpainted.



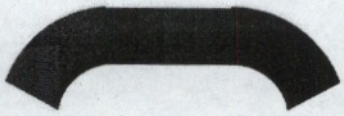


Fig 2 - Right intake cover

Fig 2 - Left intake cover

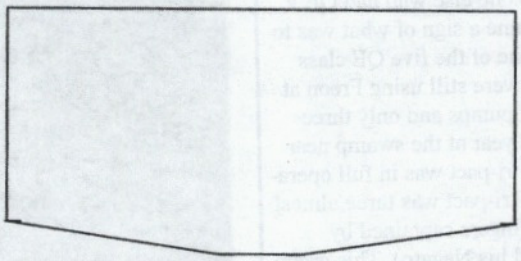


Fig 3 - Stack sheeting

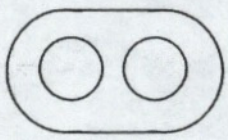


Fig 5 - Top of balsa stack

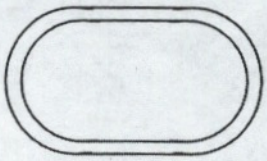


Fig 4 - Top edge of styrene stack sheeting

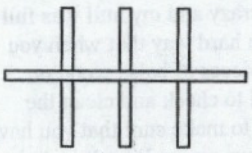


Fig 6 - Grate is slightly oversize, so it bows inside the top

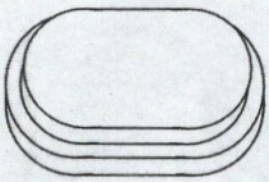


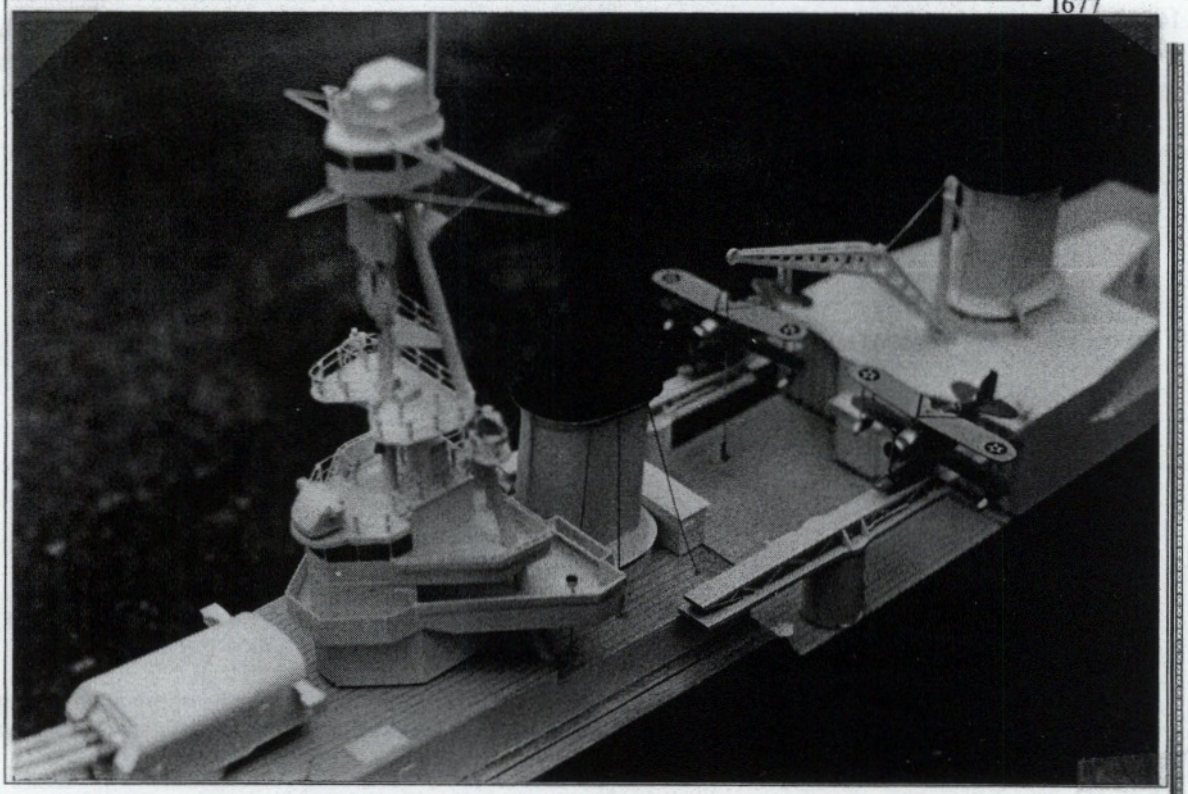
Fig 1 - Balsa base

3) With the base done, the next step is to get some balsa block and make a funnel. The funnel should be the scale height and width of the ship you are building. Some US cruisers have round funnels, like the Brooklyn, but balsa is still much better than wooden dowell rod. Don't sweat minor imperfections.

4) With the balsa funnel done, it's time for the intake cover. See Fig 2 for the right and left sides. You want to make the radius of the edges slightly larger than the radius of the actual funnel, so that when you wrap the intake cover around the funnel, it wraps at an angle. Superglue this to the bottom of the balsa funnel (use kicker).

5) With both halves of the intake cover in place, it's time to sheet the funnel with 010 styrene or

lexan. Note, if your funnel leans back, you need to center the sheeting at the front of the funnel, and cut an angle at the bottom of the sheet on each half, to fit correctly. See Fig 3. Once the sheet is trimmed correctly, use CA to wrap the balsa funnel with the sheeting. Leave a 1/8" edge at the top of the funnel.



6) Time to get fancy. Using the top of the sheeted funnel as a template, cut out a top for the funnel. Then, cut out the center of the top, leaving about 1/8 inch width. The larger oval will be glued to the top edge of the funnel sheeting after step 7. Save the inside piece, cutting smaller holes in it, and CA to the top of the balsa stack. See Fig 4 - funnel top, and Fig 5 - balsa stack top.

7) See fig 6 - grate. Cut small strips of 010 styrene, slightly oversize of the funnel top. CA one side first, then bow the strips out the other side of the funnel top, then CA the other end of the strips. It should look like the grates are coming from inside the funnel, bowing over the funnel. Glue this assembly to the top edge of the funnel.

8) Next, cut out very small triangles to glue around the top edge of the funnel, to support an 20 guage wire, roughly 1/8" away from the funnel, all around it. The wire wraps around the funnel, about a quarter inch from the top.

9) Next, CA a 40 guage wire around the funnel, about an inch from the top. There are no triagle spacers for this wire.

10) Glue the completed funnel to the base. Use 40 guage wire to connect the deck of your ship to the 40 guage wire wrapped an inch from the top of the funnel (funnel supports). Add any additional pipes, whitstles, etc, to the outside of the funnel.

DISAPPOINTING RULE CHANGE IN MWC, by Fluegel

This is 100% opinion, my opinion. The speeding up of small ships looks fun, and gives help for disadvantaged small ships. New voters may see this change as healthy, but what they do not see is that every help to one class ship is a disadvantage to another class. It would probably be in the best interest of the club to allow Nat's participant's votes to count twice. This would promote "voter education", and place some value to the most committed of the magnificent obsession.

Velocity Test 2000

By Brian Finster 1/15/2001

During the holiday season, there is nothing more rewarding than the fellowship of standing out in the cold with your friends while destroying high dollar equipment.

On the weekend before New Years, Stan Watkins, Fluegel, and I got together to perform several tests. These covered BB velocities and penetration at various PSI levels. Attached are the results.

The Testing:

We used a standard firearm chronograph to measure velocities. PSI was measured

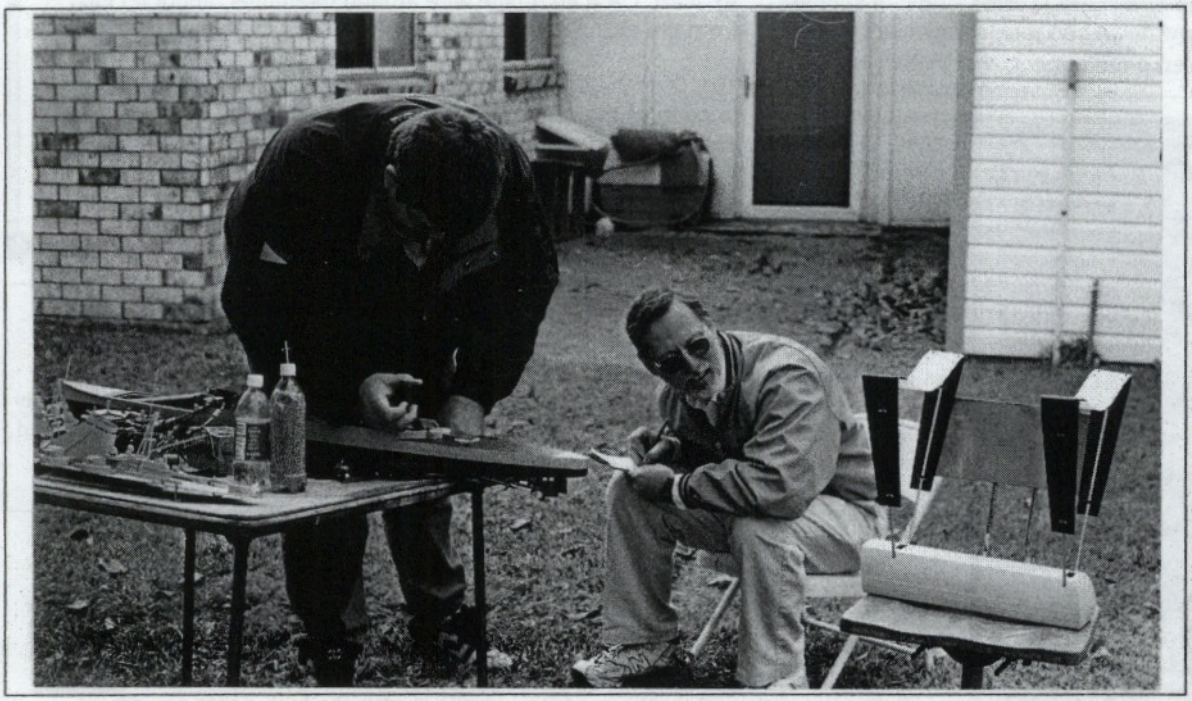
using Fluegel's pressure gauge. We also fired a spring powered BB pistol and rifle for comparison. The Daisy Mdl. 188 pistol is the low end of the power scale that Daisy produces. The Daisy Buck rifle is designed and sized for children to use. When ship guns were used, they were tweaked to a combat setting. Pressure readings were taken before every shot to eliminate the possibility of drift.

Daisy Mdl. 188 pistol	Shot 1	Shot 2	Shot 3	Shot 4	Shot 5	Average
Point Blank	190	185	177	184	195	186.2
36"	180	178	173	179	181	178.2
Daisy Buck Rifle						
Point Blank	251	267	256	260	247	256.2
36"	241	225	246	239	232	236.6
Single by-pass gun						
150 psi	216	216	219	217	219	217.4
100 psi	200	207	194	202	204	201.4
Double by-pass guns						
150 psi	223	217	214	196	196	209.2
100 psi	167	170	168	166	167	167.6

During this test, we also did tweak level comparisons. We found that o-ring compression yields diminishing returns after a certain point. Guns that sounded weak were actually firing nearly as hard has guns that made a nice 'popping' sound.

We also did testing to see how long a BB retains its energy. We fired the Daisy Buck rifle at ranges from 6 inches to 50 feet. The velocity change at these ranges was negligible. It appears that BB's can cause damage beyond what I'd expected. This became apparent when a BB flew low and bulls-eyed the LCD screen of the chronograph. Sorry Stan.

Penetration:
Penetration tests were done with the following:
Stan Watkins' Washington: Sheeted before MWC Nats and used for MWC and IRCWCC Nats.
Daisy Mdl. 188 pistol – Added to this pistol was a dowel that extended 10" past the muzzle for repeatable distance measurement. Also, a protractor and plumb bob were added to measure angle shots.
Fluegel's Baden with a regulator adjusted to 100 psi: Fluegel's guns were used because he does not have the most powerful guns. They are about average (Fluegel says below average) and we wanted results from average guns.

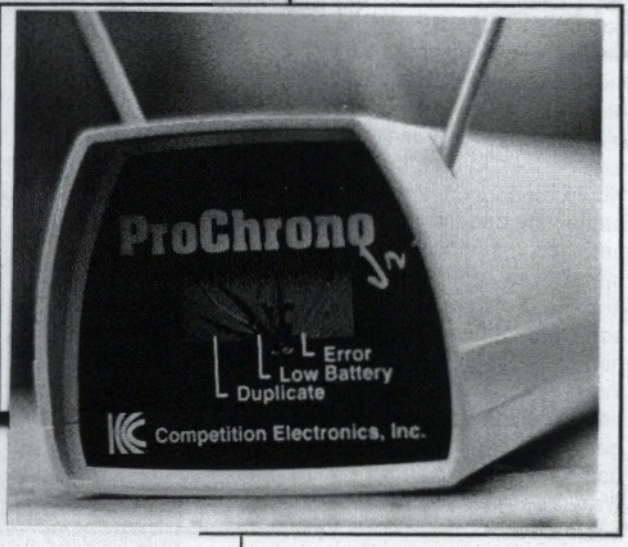


The first test used Stan's ship and the BB pistol. The end of the dowel was placed below the waterline and just above the bottom of the window. While holding the dowel in this location, the pistol was angled to 15 degrees below horizontal. This angle was chosen because it simulated many sidemounts while forcing the BB to pass through more water than a 20 degree angle would. In the chart above, you can see that the Daisy pistol should produce around 180 fps at ten inches.
In this test, we were only able to get off six shots before the tester damaged our testing device. Of the six shots, three penetrated an inch below and two dented the balsa below the penetrable area. One BB was unaccounted for. After this, the dowel broke off of the gun when the tester tried to use it to stop USS Washington with it.

In the second test, Washington and Baden were manually placed in a position to allow one of Baden's sidemounts to impact on Washington's hull below the waterline. Baden's regulator was adjusted to 100 psi. Ten shots were fired into Washington. Eight shots penetrated the hull. One shot was unaccounted for, one shot bounced off of a rib but left no balsa at the impact site. Of the shots that penetrated the hull, all left clean holes with the BB's passing all the way through the balsa.

Observations:
At the lower pressure setting, the test guns worked reliably, but did not "sound" as impressive. Still, below the waterline holes were made without effort. I encourage others to perform additional tests using oblique angle shots and multi-gun arrangements. I'd also encourage others to test guns that may have stronger springs than the guns in my Mogami. Mogami is currently using the cupro-nickle springs from Dremel brush replacement kits.

Conclusions:
I'm not yet ready to draw any conclusions. The next battle I fight with an adjustable regulator (Fray at Brays 4/28/01), I intend to fight at 100 psi. I'll be interested to see the results.



Supplemental information:
Many have expressed the opinion that we should adopt the penetration tests that our Big Gun cousins use. In this test, guns are fired into a 2" thickness of a certain brand of insulating foam. Guns that penetrate the foam are considered too powerful and must have their pressure reduced.
Big Guns captains I've consulted gave me data from their velocity testing. According to their tests, a legal BB caliber gun fires at around 205 fps, while a legal ¼" gun fires at around 165 fps. The BB caliber velocity is not that much softer than the measurements taken from Mogami's bypass guns. The ¼" balls are slower, but deliver almost twice the energy of one of our BB guns. (see below) Based on this information, I feel the foam test is not needed. I feel we have currently reached the upper practical limit of BB velocities at 150 PSI. Super guns are a myth.

Energy {joules} = ½ mass {kg} x velocity {m/s} squared
Mass BB = 0.0033kg
Mass ¼" steel ball = 0.0091kg

217 f/s = 66.1416 m/s
165 f/s = 50.292 m/s

BB energy = 7.22 joules
¼" ball energy = 11.51 joules

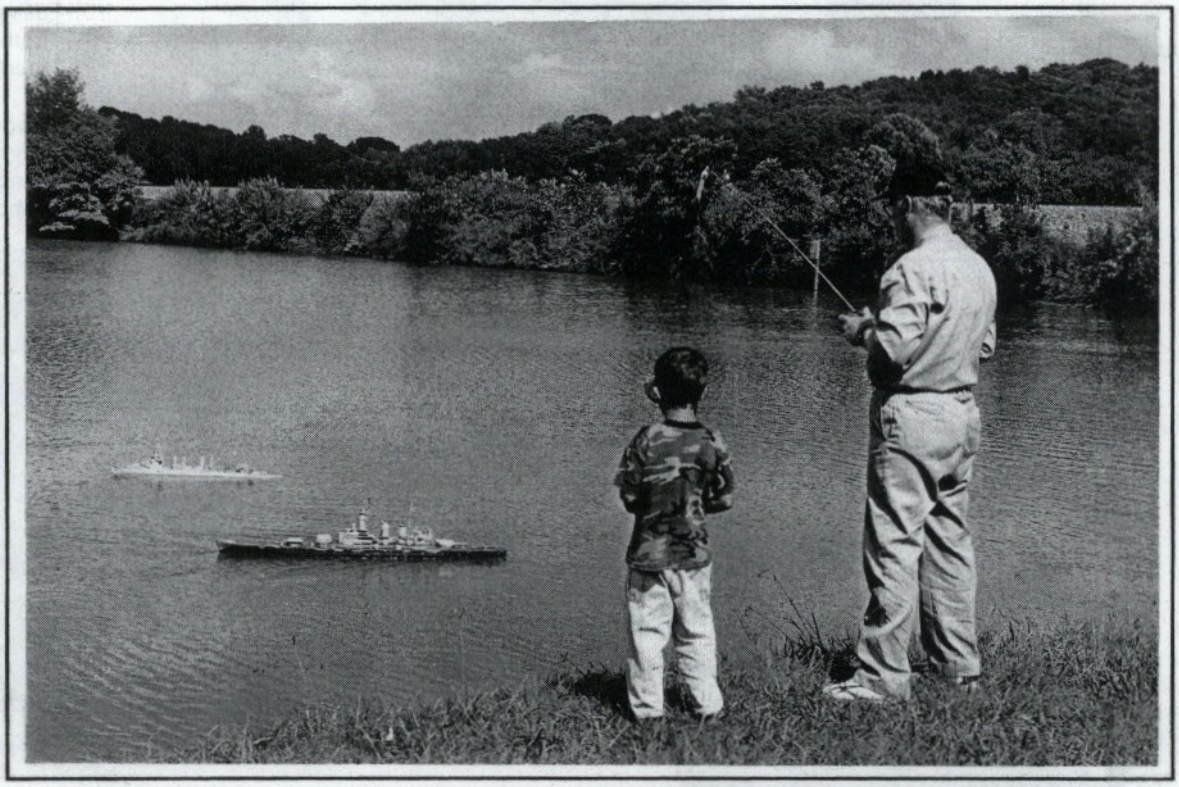
The Grandest Battle?

By Stan Watkins, 8/04/2000

On Tuesday August 1, 2000, outside Farragut, Tennessee the weather was a very warm and sunny with only a gentle East Tennessee breeze blowing. The two ships had been prepared for the meeting with a fair degree of attention. The Captains were eager to shred balsa.

History and Introductions

The more powerful warship (by far) was the USS Washington (BB-56). The North Carolina class battleship was completed just before WWII and was the pinnacle of American surface warship technology at the beginning of the war. The model is a six unit ship with five guns and a good reliable pump. She had only two weaknesses. The starboard sidemount was not operable and her Captain (Austin T. Holiday) lacked experience. In fact, this would be his very first battle. He had lots of experience with video games, but simulation and the real thing are somewhat different. He had driven the USS Washington numerous times including some target practice missions, but had never taken her to war. The Washington could absorb tremendous damage without being in any danger of sinking (barring malfunction of course). So there was not much chance of the inexperienced captain making a mistake that would prove fatal to the large vessel.



Opposing this mighty capital ship was the light cruiser USS Detroit (CL-8). Designed shortly after WWI, by WWII, the obsolete Omaha class cruisers were relagated to backwater perimeters of the frontline war. The Detroit is a class 2 ship with 2 guns and only a half unit pump. She was the pioneer in the development of the "Running Gunning" ship and tactics and was probably the first ship with only stern guns fitted. Her comission was to be a "standoff sniper" utilizing the stern guns and high speed to hit heavier more powerful warships, while always ready to run away from any direct confrontation. Her initial combat career was disasterous because inadequate batteries did not provide the speed needed to execute her tactics properly. She was quickly withdrawn from combat service and replaced with a hastily completed USS Oregon City for the Springfield Missouri Nationals of 1984. With the proper speed, by the end of that year's nationals, the running gunning tactics had been demonstrated, to her captain, s a much sought after "unfair advantage" over other ships and tactics. When the rules were changed and the Detroit received 23 second speed and the ability to have a "half pump" new batteries were located and she was brought back into service. At the 1997 nationals, she received only one BB hole in damage out of the 60,000 BBs fired in that week long event. She also won the "Best of scale" award that year. The "Best of Scale" was a surpising first for her veteran Captain. The following year, the new replacement, USS Washington won best of scale for the same Captain. But the Detroit's radio had been removed to operate the Washington and Detroit was pressed into "Static Model Display Duty". At the 2000 IR/CWCC Nationals another Attack 4 radio was obtained and following the captain's return to Knoxville, TN, the Detroit was brought out of display "mothballs" and returned to active combat capability. She was found to be in very good condition with the exception of fairly brittle original 1980's hull skin A few leaks were found in her CO2 gas piping and one servo motor was found to be stuck. The stuck motor shaft was loosed using a set of mini-channel locks and the gas leaks were secured. The 1/2 unit pump motor was demonstrated as being able to operate in manual radiocontrol mode. The old solid state automatic turn-on system was not checked out. The brittle hull skin remained. Captain Watkins announced to the excited Captain Holiday that a battle could be held using these two ships. Captain Holiday quickly stated that he wanted to command the USS Washington. Captain Watkins agreed to that condition and asked about others. In two previous battles with his son Steven, Captain Watkins had so dominated the competitions that Steven had never wanted to battle again even when offered $1.00 every hole that Steven shot in the USS Detroit. Steven was unsuccessful in collecting even one dollar and his ship and was left in sinking condition both times. Captain Watkins recognized the danger of spiritual damae if he overwhelmed his newest young opponent too viciously. So Captain Watkins asked if Captain Holiday wanted Captain Watkins to allow Captain Holiday win the battle. Captain Holiday said yes, let's battle and then let me win. That would be a real test of Captain Watkins' control.

So Captain Holiday helped load supplies into the car for the trip to Anchor Park lake. Captain Watkins took his camera to obtain some historic photos of the event. For, you see, it would not only be the first battle ever in the Anchor Park lake, it would be the first

ever battle between Grandfather and Grandson. The ships were loaded with BBs and CO2. Captain Watkins felt a bit uneasy about the Detroit's old Nicad batteries. Would they hold sufficient charge to complete the sortie? Capatin Watkins informed Captain Holiday, that the battle would be cut short if the Detroit's batteries were going dead. As Captain Holiday sat at the Anchor Park pavilion table, Captain Watkins coached a pose and snapped a picture. Just before battle, God intervened in the form of Sherry Watkins, Captain Austin Holiday's grandmother and Captain Watkins' wife. She was glad to take the photograph of the two brave Captains ashore with their two ships on the water in the background. Truely a historic photograph. Thanks swet Sherry Lynn and Good job! ! !

The Grand Battle

Following the photo opportunity, the battle commenced. Captain Holiday was quick to incorporate the fact the the port sidemount was the functional gun into his tactics. Captain Watkins, in a peaceful trusting gesture, allowed the Washington to pull along side the Detroit. Captain Holiday ruthlessly opened fire. Immediately a waterline hole was observed to appear in the hull of the Detroit. Sherry Watkins explained with some excitement, "Oh, a waterline hit !" Strangely, for a monment, Captain Watkins felt a surge of pride, in the ability of the young Captain's accomplishment, welling up in his heart. But soon the surge of pride was dampened by the sight of the water stream exiting the Detroits pump outlet. This was a very rare sight for the Detroit to actually be pumping. The bow was down about half an inch. Clearly the Detroit had been seriously damaged. With only a 1/2 unit pump she could not stand too much damage and what about the questionable batteries? Captain Holiday was quickly winning th battle. One bit of good news for the Detroit, while Captain Watkins stood ashore in disbelief, the solid state automatic pump "turn-on" had initiated the pump operations and probably saved the ship. So with the inspiring sight of the pump stream dwindling, Captain Watkins went on the offensive. Captain Holiday's inexperience was evident as he place Washington broadside of the Detroits twin stern guns. These guns are set up to fire singly. As Captain Watkins operated the gun fire lever, the BBs were heard to exit the barrel and strike the Washingtons hull. Numerous times the Detroit managed contacting hits on Washington. Captain Holiday was inadvertantly firing both the triple stern guns and the port side mount whenever he wanted to fire only one set of guns. Before the battle he had been cautioned about that possibility. Soon the Washington was out of ammunition and Captain Watkins instructed him to declare "5 minute rule". Although sometines pumping a particularly heavy pump stream, the Detroit ws still full of fight and could still out accelerate and outrun the Washington. Whenever her rudder was set straight she culd be seen to lunge forward and out of the way of the Washington. When his guns were empty, Captain Holiday seemed intent on ramming the pesky light cruiser. Captain Watkins had to caution him several times to avoid the ram situations. Following the emptying of one of the Detroit's stern guns, Captain Watkins noted that the other stern gun was tweaked a bit too tightly and was not responding promptly to firing lever operations. This was just as well because Captain Watkins was concerned for dragging out the sortie time on questionable batteries and did not want to pound the Washington to heavily and discourage Captain Holiday. So Captain Watkins delared "5 minute rule" also and then realized the Detroit only had to wait 2 minutes to be off the water. After Washington's 5 expired Captain Watkins brought the injured Detroit in first and then recovered the Washington. The Washington' pump never even came on once. The Detroit continued to pump for sometime after she was removed from the water.

The results of the battle were as follows:

Damage to the Detroit was 2 above the waterline hits and 1 on the waterline hit. For 45 points.

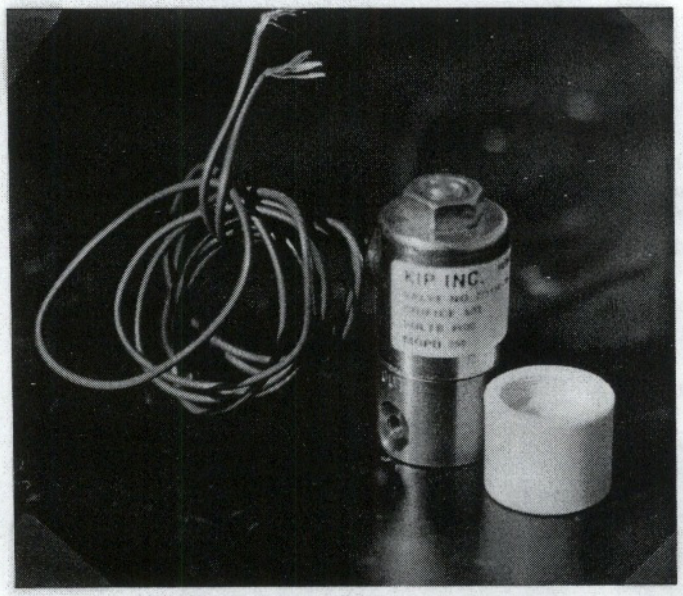
The on the waterline hit had knocked out a section of brittle balsa hull skin about 1/2 inch long by a BB high. That was why the pump was working so hard and why the bow was down so much from just one hit. One of the other hits was also below the water when the bow was down that much and therefore contributed to the water flowing into the hull.

The Washington's damage was 8 above and 3 on the waterline hits for 155 points.

So Captain Watkins had not been able to resist winning but much sincere and well deserved praise was heaped on Captain Holiday for the way he had hit the Detroit hard and caused her to be in trouble right from the start. The Washington's holes were not counted in his presense. So the scores remained unknown to him. Captain Austin Holiday has since, asked to have another battle, so apparently is not discouraged. He admitted that he felt some hostility when the Detroit's BBs were heard striking the Washington. So the future battles could be much more interesting as Austin develops more experience.

Plans for IRCWCC NATS 2001 are moving along. There are many attractions near by so consider bringing the family for a vacation and RC combat. We are looking at two levels of motels, our least expensive shared rooms and a more up scale family type place. Applications will be mailed with the 2001 Rules Package and Ships List.

Don Fisher, NATS host 2001



SAVING WEIGHT
By Fluegel

With small ships gaining popularity, losing weight has also become popular. Jim Pate first used Alumilite to replace the solid brass, (solid and heavy) bottom of Kip brand solenoids with a cast of the much lighter moldable material Alumilite. It is light (for it's strength) and Brian Finster has replaced the original brass base with the lighter replacement for his cruiser. It feels like the solenoid is half it's original weight.

The One Inch Quest

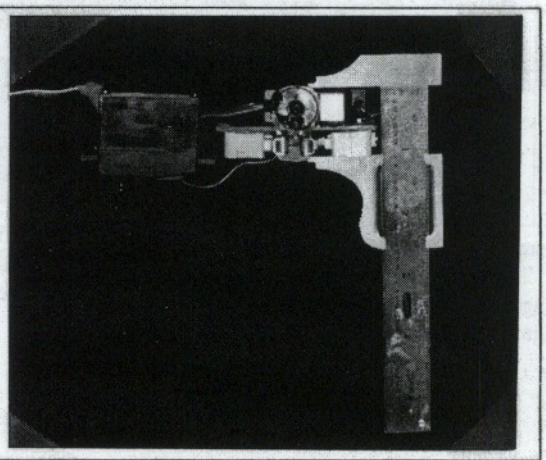
Phill Lowe, Washington Cascade Column

I am happy to report that the one inch quest has been successful. The Fond Du Lac will be refit with an Otterbox as the radio box.

The Fond Du Lac is a Liberty Ship model. In a club with several aggressive captains this means that she spends a fair amount of time on the bottom. The original radio box was thin plywood covered with light fiberglass. This is the same construction that I have used for several radio boxes with little trouble after much bottom time. For some reason this box has failed to stay dry. Very tiresome!

There has been talk about the Otterbox products on the maillist and I have seen the URL before but opening the radio box of the Fond Du Lack and finding everything covered in green mold spurred me into action. I looked through the Otterbox website and realized I had a problem. Either I figured out how to get the radio gear for the Fond Du Lac into one inch or I filled entire ship with a much bigger box.

Being just a convoy ship helps, all I need in the box is the rx and the throttle servo and switches. A standard servo is already too large, but I have a couple of mini-servos. I took one and glued on a set of micro switches in the normal fashion and took out the ruler. One and a half inches wide, about two inches long and two high. Good, but not good enough. I looked back at the single switch version I had built for the pump and scratched my head. I ripped the switches off and glued a rectangle of lexan to the side of the servo. Then glued the switches to the lexan so that the arms framed the servo arm. This means the whole assembly is the thickness of one mini-servo plus a sheet of lexan and the micro-switch. Pulling out the ruler shows the total to be about 7/8th of an inch thick. Perfect!



My clear 3 15/16 x 2 5/8 x 1 ID otterbox is on the way and will house the receiver, an LED and the throttle servo. It can be opened and closed without tools while assuring a watertight seal. I am starting to look forward to convoy battles this year!

(Check out www.radicalrc.com, Dave has a mini-servo for $15 as well as cheap shipping for many radio accessories!)0

Self Talk
By Fluegel

"No, honey, I have to **work** this weekend on my ship". It really should be, "No honey, I want to **play** with my ship this weekend".

This ship stuff is fun, where work may or may not be fun, work may just be work.

"QUICK··· PUT IT IN REVERSE!"

How to subscribe to Hull Busters

Send me money! Yep. pretty easy. Send $9 to Fluegel, 917 Hudson Dr. Garland TX, 75043.

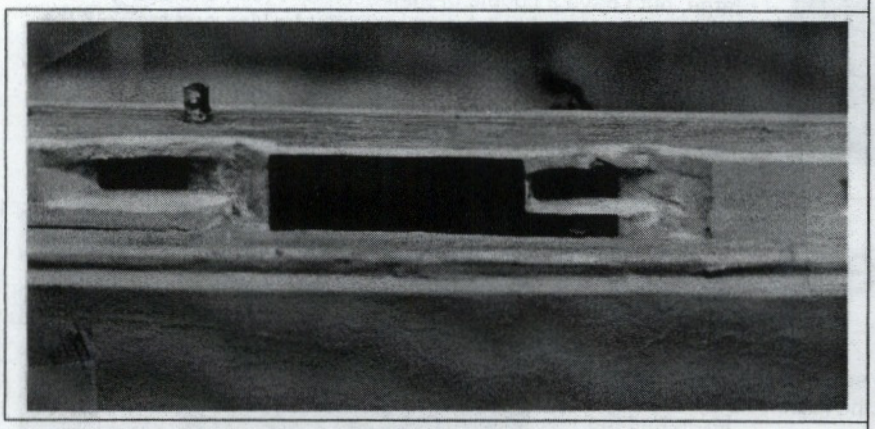
If you want ***past year issues***, send $5 per past year. I have ....1985-2000, I think, I may even have older. I may be missing a few issues, that's why it's only $5 per year. It used to be $6 or $1 an issue, but I may be missing a few issues, so I have reduced it to $5 per year, whether there is 5 or 6 issues, its still just $5. Tell me what year(s) you want, and I will start digging.!

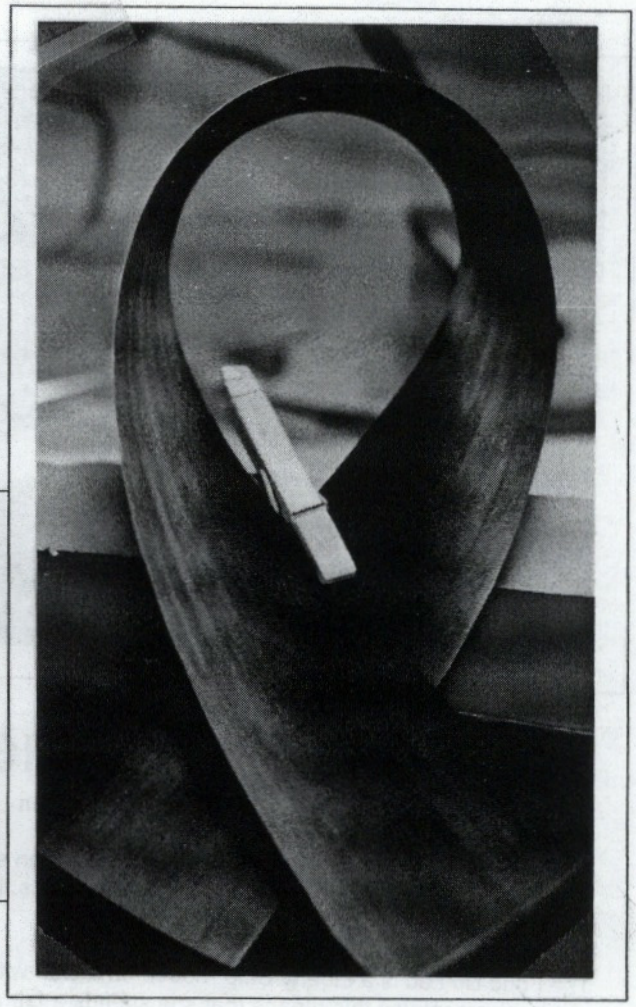
THE HOLY OF HOLYS

By Fluegel

There was a room in the temple where only one high priest could enter each year. It was called the holy of holes. Sacred artifacts were stored there, and the honored priest surely had an overwhelming sense of awe as he entered. I too have been to the holy of holes. Yes, I have been to Swampworks, but this is another such sacred place. I have been to the back rooms of .....Lone Star Balsa. Two ladies labored undisturbed as we (Stan and I) viewed the secret parchments. Blocks of balsa 6"X 6" by 48" were shipped in and then cut and graded, and sorted. It was awesome. The balsa is not as good as Swampworks, but it is soft.

While there, we stumbled upon a new product, new to us anyway. Sheet carbon fiber graphite. This is the stuff used to protect Indy racecar drivers. Anyway, I bought a piece as armor to laminate my superstructure. It's not expensive, 0.007 X 2" X 24" was only $3.50. It cuts easily with scissors and may be a way to protect your flat sided





superstructure surfaces. I will let you know after the "fray at Bray's" battle.

Their phone number is 1-800-687-5555, Website is http:/www.lonestar-models.com again, purchase your wood from Swampy, but they have many sizes of carbon fiber graphite at this holy place.

HULL BUSTERS
917 HUDSON DR.
GARLAND TX
75043

CALENDAR OF WAR!

IRCWCC Nats July 8-13 or July 22-27 in Rhode Island. MWC Nats the week between, in MO. MWC regional battle on April 28-29 in Oklahoma.