

HULLBUSTERS

APRIL 1986



Building a Gun System By Chris Pearce

It has been quite a while, (3 years) since something like this has been attempted, so, I have decided that the rookies of these days could use an article that would go over all the basic details on building a complete and working gun system. For this, I will choose an example ship, the USS Salt Lake City. (wonder why??) This system will consist of two guns with Foster breeches, Amend interrupters, and a waterbathed freon tank.

First of all, I would like to profoundly thank all of the people over the years whose gun designs have progressively improved our hobby. It is frightening to think of where the hobby (or the allies) would be if it weren't for people like Stan, Foster, Camurati, Schneider, and Bob Amend. I do not proclaim to be an expert on these matters, but, as I work on my second and third systems, I think I know enough to hold my own. (I think...) Also, none of these words are etched in stone anywhere. This is just an example, and there are as many different ways to build a gun system as there are combatants. Sure, there are people who know more about this subject, but apparently they're afraid of word processors, or something.

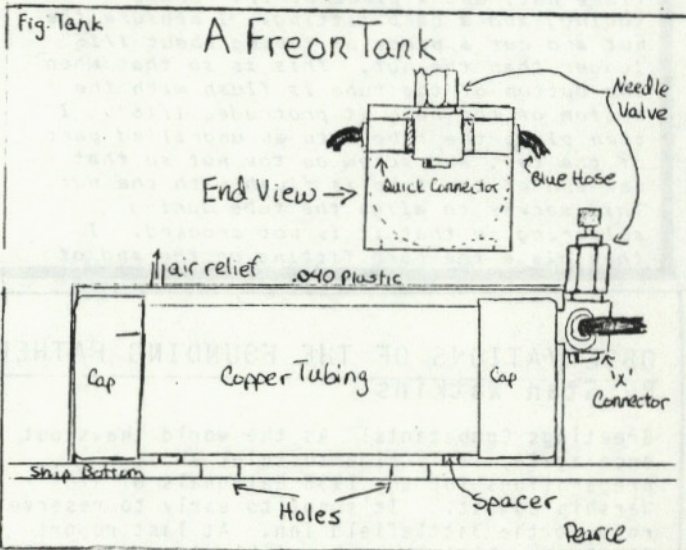
So, for all you rookies out there, lesson #1 is that the Mk IX is basically obsolete. Sure, it can be made to work, but today's technology makes guns much more simple to operate. Sorry Stan, but that's the truth...The Foster breech is where it's at. So, for those of you who still have old Mark IX guns, you might as well convert them before you get to Nats.

All right, now our first task is to build a freon tank (fig. tank), so that we will have something to fire the guns with. The current fad is waterbathed copper tanks, so, since this is what I will build, I will describe it. (besides the fact that it is the best way) For my ship, I will take a piece of 2" dia. by 3" long copper pipe, or something like that. Onto either end I will solder a cap, and on the end toward the bow, I will drill a hold through the cap side and tube. Into this will go a hex connector. (soldered, of course.)

This is so exciting, another vonderbar issue before the Championships and, I will once again go out on the prophet limb & predict another lop-sided victory for the Axios. What will it be, 7 in a row?...probably eight. The Allies are still exerting a token effort. Momar Jass is studying old video tapes looking for mistakes in his strategy. The opening scene should be of him leaving his house. Consider this pathetic thought, think about the clowns on his team that are simultaneously preparing to be sacrificed on the Altar of Axis gory glories! Well, I feel the B.S. is flowing pretty strong so you should be adequately prepared to read about the magnificent obsession.

Into this, I will screw an "x" fitting. Out of the two sides will come connectors for 1000 psi hose from clippard, and from the top there will be a needle valve to fill the tank with. One could also use Mk IX type freon spheres, maybe one for two guns even, so long as the tank is waterbathed. One way is shown in Fig. system. So, now that I have a tank, I will build the waterbath part.

To waterbathe the tank, there are two methods I could use. The first, and simplest is to simply cut a hole in the bottom of the hull so that the tank protrudes slightly into the water, and then use silicone cement to glue the tank in. The other method is to use a box inside the hull filled with water. For this, I will first put a pair of balsa strips on the bottom, and cut two holes between them, one in the front and one in the rear, so that water can flow through. Then, I will place the tank on these "pedestals", and glue it down. Now, I will build a box around this tank out of .040 plastic, so that it will be watertight and impenetrable. There will be a little clearance at the top for an air bubble. A tube will come up from this bubble area to just under the deck so that air can bleed out of the assembly when I put the ship in the water. This, then will take care of the freon tank. Next up is connections to the guns.



Now, then, I have a couple of 1000 psi "blue" hose connectors coming out of my freon tank. Obviously, I need some blue hose to connect with. (that last word was for any unwitting axis..They need help.) I will also have another pair of connectors hooked onto my poppet valves. So, I will connect the freon tank to the poppet valves in my watertight box with hose. The poppet valves are equipped with cam followers so that my cheap servo can operate both guns with ease. A bit of information here, a poppet valve is necessary because of the

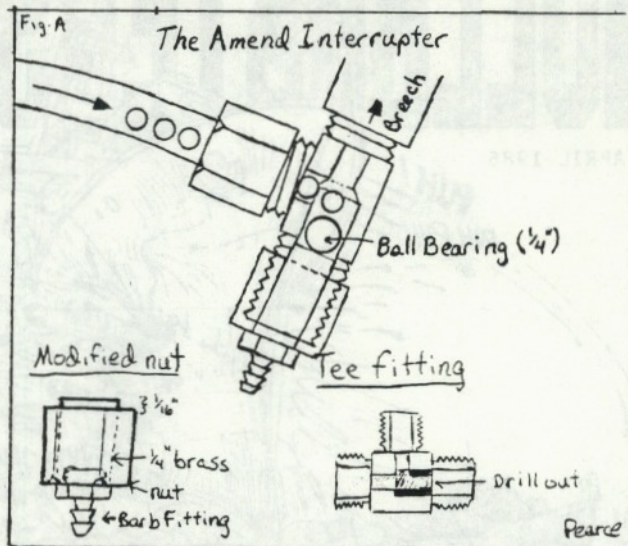
fact that it turns on instantly, and gives much more flow of freon than a needle valve, which is necessary in these guns. As for mounting the poppet valves, they are in one end of my watertight box, with the cam followers facing inward so they can be engaged by a cam on my servo. From the sides of the poppet valves come two barb fittings which are connected to regular 100 psi clippard hose. These go to the two guns.

All this leads to the two guns. The first part we will build for the guns are the magazines. The magazines I use are made of copper, which is easy to work with, and are capped with old Mk IX style fittings. To make a magazine, I first take a piece of 1/4" copper about eight or less inches long (up to 50 b-b's). I smooth out the ends of the tube, and then flare one end. Of course, it helps to make sure that your magazines aren't too long to fit in your ship. (unlike myself...oops!) Then, I slide a flare nut down the tube and build a plug. To build a plug, one can remove the hex fitting from a Mk IX plug, and solder over the hole. One can also be built by soldering a piece of brass tubing into the end of the plug and putting a small o-ring over it. This then screws into the flare nut and closes off the magazine.

The magazine then flows down into the ball bearing elbow (fig. A). To build this, I start with a 1/4" compression tee fitting. On one end of the crossbar of the "T", I take a 1/4" drill and drill downward into the fitting until the drill is about halfway or so through the side port. This allows the ball bearing to go up far enough to prevent more than one b-b to pass through. Bob Amend uses a 17/64" drill to drill out his fittings, and this may work even better. As it is, I had to dremel off some rough edges before the ball bearing will go back and forth easily. Then I build a cap for the bottom.

The cap is not built the same way as Bob Amend said. Actually, James Foster suggested this improvement in the April '85 Hullbusters. To build this, I take the flare nut, and a piece of 1/4" brass tubing, and a barb fitting. I measure the nut and cut a piece of tubing about 1/16" longer than the nut. This is so that when the bottom of the tube is flush with the bottom of the nut, it protrudes 1/16". I then place the tube into an undrilled part of the tee, and screw on the nut so that the end of the tube is flush with the nut. This serves to align the tube during soldering so that it is not crooked. I then place the barb fitting on the end of

the tube and solder it together. (not to the tee, axis...) The use of this type of fitting allows the use of only one ball bearing, and adjustment of the at rest height of the ball bearing.



Then, I can drop in the ball bearing, wrap teflon tape around the end of the tee the nut will go on, and screw on the nut. This gives me a working restrictor. It can then be attached to the magazine with the compression fittings, and the magazine bent to fit. However, I solder my compression fittings if at all possible, to insure that there will be no leaks. This requires that I postpone putting the mechanism together until after I have soldered the magazine, tee, breech, and connector on.

For the connector, one takes a moderate piece of copper and bends it so that the tee fitting will be at an angle. It must not be too long, or else the gun will bottom out, which is not good. This, of course, connects the tee and breech. (hence the name...)

This brings us to the scary part, or from what I've heard from many people it seems to be. This is the breech (fig. breech). Personally, I find it easy, and much preferable to repairing damage... Okay, the breech I use is a late style Foster breech, with a slight modification. For Foster's breech, he uses a 1/4" compression to 1/8" male pipe thread fitting. This works, and so does a 1/4" compression union, but they have a tendency to take up lots of room, and lead to protruding nuts, tubes and other ugly

OBSERVATIONS OF THE FOUNDING FATHER

By Stan Watkins

Greetings Combatants! As the world thaws out once again, it is time to think about preparations for the 1986 Nationals of R/C Warship Combat. It's not too early to reserve a room at the Battlefield Inn. At last report NAMBA was still the only viable insurance. Some things never change (except for price \$25 this year). Of course ships need to be brought out of dry dock and checked out. Speeds will have to be checked against the new rules. Radar size, penetrability, and ship scale weight should all be checked now, to assure that you know exactly what has to be done to get your ship ready for the Nats. You should then, set schedules for the completion of all of these things, and of course sea and gunnery trials and practice, practice, and practice. That's good advice! Why don't I do it?

To quote from the "Human Owner's Manual" (BIBLE). "For that which I do I allow not; for what I would, that do I not; but what I hate, that do I." Romans 7:15 (King James Version). Sin being what the author hates. In R/C Warship Combat, a lack of battle practice and debugging of ones ship, are "What I hate" in myself.

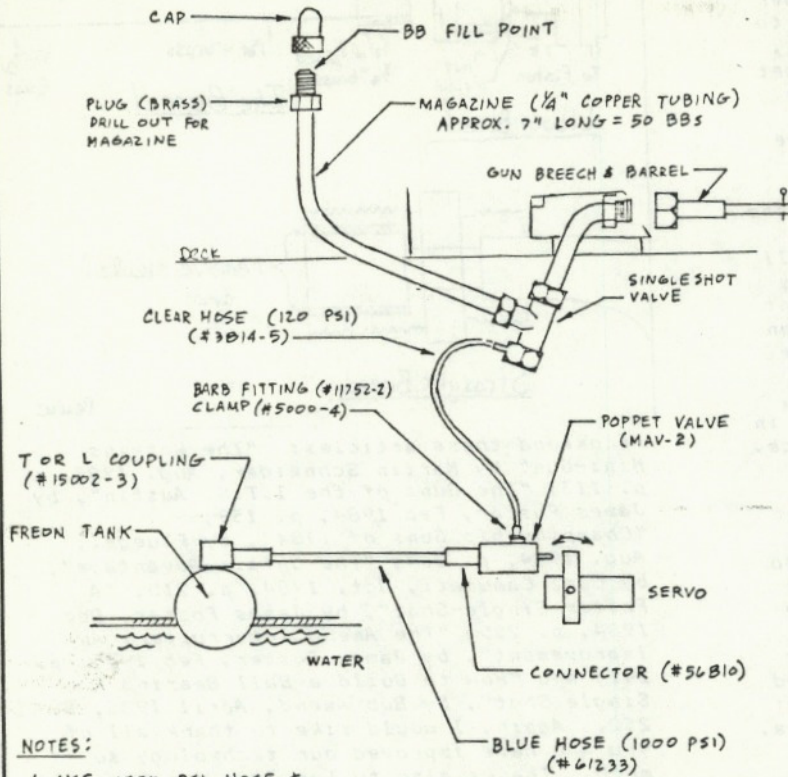
Until one is willing to do these things, he will not become an official "Von Fleugel Traveling Trophy" winner.

But at least the Competition can be fun without winning. Someday I'm going to be awesome. When will it be? I remember 1979 and 1980! That was fun! Yes, it is more fun to win than to lose, but a good closely fought battle is also a lot of fun even if you lose. Have fun getting your ship ready and;

Let's Battle!

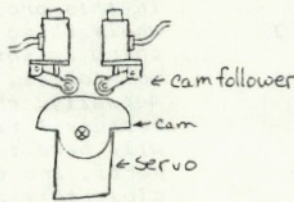
Stan *Stan*

Fig System



NOTES:

1. USE 1000 PSI HOSE & CONNECTORS BETWEEN FREON TANK & POPPET VALVE
2. BOTTOM OF FREON TANK IS COOLED WITH POND WATER
3. HIDE MAGAZINE IN SUPER-STRUCTURE.



TMJ:10-28-85

contrivances. I prefer to use a 1/4" compression elbow because it is light, and uses up little space. To make it into a breech requires one major tool, besides a drill and vise. This is a 5/16" end mill. A 5/16" drill also helps greatly. An end mill can be found at a good tool supply place; I had no problem finding one. (I don't mean K-mart...). I then chuck the elbow into the vise, and drill one end until I have a good hole started. Then I place in the end mill and mill it until it is flush with the bottom of the formerly 1/4" hole. It has been said that a 5/16" drill grinded flat works, but it can't beat an end mill. With this completed, I have breech.

Then, too, there is the barrel. This is the "difficult" part. To make a barrel takes a 3/8" piece of both 9/32" and 5/16" brass tubing, a 1" piece of 1/4" brass, and a 3" piece of 7/32" brass tube. The last two can be adjusted for scale appearance, if desired (Axis can ignore that last sentence.). Once the pieces are cut and smoothed out so that they fit over each other, I align them all on one end so that they have a reasonably flat base, and the two 3/16" pieces are even with each other. Then, I solder them all together by flowing the solder in from the base of the barrel. With this done, a little sanding (or filing), and maybe some dremel work smooths out the base, and a barrel is completed. Then, of course, I drill a hole through the end for a safety pin.

The last component of the gun is a 5/16" O.D. o-ring. This is dropped into the breech, the barrel inserted, and the nut tightened on. Once you have assembled all the components of the guns with solder and compression fittings, and connected them to the poppet valves with 100 psi hose, you are ready to test the system. This brings us to operation.

Here, again, I will start with the freon tank. To fill, it takes a large tank of freon, which costs about \$50 for 30 lb. One can also get 15 lb bottles; make sure it's freon-22. Freon bottles have a built in valve with a flare fitting on them.

continued on next page

FROM THE TREASURER

Once again it is that time of year. Uncle Sam is demanding his annual dues, and so is our club. At the date of this writing only six people have rejoined IR/CWCC for 1986, and only half of those have paid for NAMBA membership and insurance. Remember, before you can legally enter any sanctioned contest you must be a member of both IR/CWCC and NAMBA.

This years dues for IR/CWCC is still only \$8.00, a bargain at twice that amount because it entitles you to privileges enjoyed by only a select few.

This years NAMBA dues have taken quite a jump over last year. If you write direct to NAMBA for an independent NAMBA membership (not affiliated with any subsidiary clubs, such as ours) it will cost you \$75.00. If you are a member of a NAMBA subsidiary (IR/CWCC), you can write to the subsidiary clubs Treasurer, me, and your NAMBA membership will only cost you \$25.00.

Any simpleton can thus see (Axis captains take note) that you can send \$33.00 to the IR/CWCC treasurer and become a member of both IR/CWCC with its fabulous privileges and of NAMBA with its necessary insurance.

If you wish to subscribe to HULLEUSTERS, simply add \$2.00 for each issue that has not yet been distributed this year. Since there are four issues yet to come for 1986 (June, Aug., Oct., & Dec.) you should add \$8.00 to your check. This money will then be forwarded to Herr Fleugel and your name will be added to his mailing list.

Here is a rundown of dues;

IR/CWCC dues -----	\$8.00
NAMBA (IR/CWCC members only) -----	\$25.00
HULLEUSTERS -----	\$8.00
TOTAL -----	\$41.00

Make checks payable to: Treasurer, INTERNATIONAL R/C WARSHIP COMBAT CLUB and send to Steve Milholland, Rt. 2, Box 81A, Springfield, Mo. 65802.

A note here about contest site insurance. In years past this only cost our club \$30.00 annually and it covered up to three different lakes around the country. Not so now. This years insurance premium is \$105.00 and this only covers one lake. Dan Hamilton has already paid this premium for his contest lake in Decatur, Alabama. As a result, contest fees can be expected to go up both for regional events like Dans, and for the Nationals. The money for these increased premiums has to come from somewhere.

Speaking of the Nationals lake, it will need its usual treatment of chemicals this year to make it suitable for model snips. The money for these chemicals comes from the clubs treasury (I.E. members dues) and from the Nationals Contest Director (Nats entry fees). These chemicals must be purchased by the first week of June. The Treasury needs your dues and Tom Jass needs your Nats entry fees so that the cash will be on hand for this purchase. Please do not wait till the last minute to join the club and Nats. If not enough cash is on hand then I will have to use my personal funds to make up the difference. This has happened two out of the last three years. I dearly love this hobby and the other combatants but I cannot afford to support the rest of the clubs financial obligations. PLEASE JOIN NOW.

Keep your freon dry,
Steve Milholland
aka "Dead Eye"

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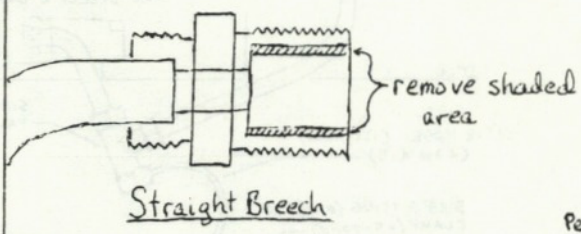
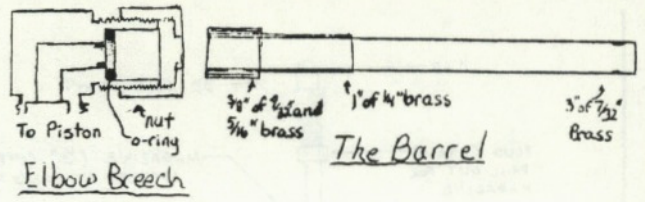
This brings the problem of how to connect it to your tank to fill it. A simple connector is made by flaring out a chunk of 1/4" copper, dropping a flare nut over it, and soldering a barb fitting into the other end. Then, with 100 psi hose, and another barb fitting, the tank can be connected to the on-board freon tank. To fill a tank, first invert the big tank, so that you get liquid freon. Open both valves, and the freon will flow through. Once this is done, close the valves and disconnect the hose, carefully because of frozen finger problems... One fill may not completely fill the tank, so some people then open the needle valve and let the tank cool off until it starts to freeze, and then refill the tank, so that it will have as much as it can hold. This is especially important with small ships, which need all the freon they can get. With this done, I open the needle valve again, until no more liquid freon comes out. This is called venting, and reduces the chance of getting liquid in the lines, and so improves gun performance. After this, all that is left is to load and tweak.

Of course, loading the magazines is rather simple, so, I will proceed to tweaking the guns, the final step. So, to tweak the guns, I tighten the nut so that there is a little pressure. Then, I fire the guns. If the shot is too weak, I tighten the nut a bit, and if it does not fire, or delays, I loosen the nut. A good shot should easily go through one sheet of corrugated cardboard, likewise 1/32" balsa. This takes some practice to get down properly, about five minutes ought to do it. (I just love Foster breeches.)

As for mounting the guns in my ship, I will use pieces of bent brass to mount them, maybe along with silicone to seal the holes, and superglue, etc. so that they will be in a reasonably scale location. Then I will do some final bending of the tubing so that the magazine fits and feeds properly, and then call it good. Fig. system, by Tom Jass shows a complete system for one gun, and has some other good information.

This, then, is a rather abbreviated version of how to build a gun. For more information on gun systems, I would

The Foster Breech (Fig. Breech)



Pearce

recommend these articles: "The Watkins Mini-Gun" by Martin Schneider, Aug. 1983, p. 113; "The Guns of the I.T.S. Austin", by James Foster, Feb 1984, p. 159; "Championship Guns of 1984", by Fluegel, Aug. 1984, p. 204; "The Unfair Advantage", by Carl Camurati, Oct. 1984, p. 215; "A Foster Single-Shot", by James Foster, Dec 1984, p. 225; "The Amend Interrupter: An Improvement", by James Foster, Feb 1985, p. 241; and "How to Build a Ball Bearing Single Shot", by Bob Amend, April 1985, p. 252. Again, I would like to thank all of you who have improved our technology so much. Thanks also to Tom Jass for his help in this project. I hope this makes the whole thing much simpler. I guess the main thing is not to be afraid of doing it, it's no problem, once you get the hang of it. Actually, this article even helped me, because I finally designed the systems I will have to build, when I finally get the parts, and time. Well, I would like to close this off by saying good luck to all of you out there. Yes, axis too...

Have fun
Chris Pearce

Rammers and Rammees

In the past several years, ship to ship rams have been a big discussion item and the source of some of the hottest debates at lake side. It is unfortunate that such an item happens and even more unfortunate that it can effect the outcome of battles.

Perhaps if we review some of the rams of the past we can see some solutions. In the NE regionals (fall 84) two rams occurred which I think are worth discussing: 1) In a ship to ship battle, a ram occurred as one CA in a left turn continued his turn across the bow of a BB. The BB expected the CA to straighten out and continued into the side of the CA causing damage to the CA. As the ships arrived at the point where both bows were pointed at each other, each capt. had certain expectations of what the other would do and acted on that information. A review of the Video tape charged the BB with the ram for failing to miss the CA. 2) The BB *Richelieu* was rammed by a BB on his own side while sitting idle in the water when the captain of the BB mistook the direction his ship was pointed. The first ram was the type which we will always have as long as we combat at close range, the second is a type which is purely bad seamanship.

At Nationals, penalties for rams were decided purely on the basis of who got rammed, even though in some cases the rammees was operating his ship in an unseamanship manner and caused the ram to occur. To decide in each in every case would require a board to review the incidents and full video taping of the entire area for review but if possible, I think this would be a better solution. In the 84 nationals, a CA to CA battle

opened with both ships on an High speed run toward each other ending as one CA cut hard right in front of the other. This turn was made about two feet before the CAs would have passed each other. The Ramer was (I believe) the *Myoko*, so you can imagine the closing speed at this point. I think the rammees took the ram penalties and the damage as well in this case because he admitted tuning across the bow at such a time as to not allow the *Myoko* to react.

How do rams effect battle? Look at the tapes of the 85 nationals when the *Rodney* was besieged by the entire Axis fleet. The *Alabama* was ramed while protecting her fellow team mate and removed from the battle area, leaving the *Rodney* to the wolves. The *Espana* suffered similar rams removing it from the field of battle during times which it was heavily engaged in protecting other ships. I am sure the Axis ships have suffered equally from untimely rams although because they operate more independently it does not show as well on tape. In some cases, a ram in time saves nine (hull hits) and a possible sinking.

A solution has been advanced to allow no firing within a set distance (6 to 12 feet) of the target ship. I believe that this would help the ram situation but not completely cure it. I am in favor of this rule change. But for the rams that occur after such a rule or a similar one are in place, perhaps a board approach such as the one used at sailboat races can be used. After a battle, an captain who has a complaint can bring it before the board for resolution.

Marty Hayes
Capt. of HMS Warspite

By Tom Jass

Greetings to all of you from the land of lilacs! Spring has sprung here in Lombard and I've been out on the pond testing the RODNEY II and the SWIFTSURE to make them slow enough to meet the 1986 rules. It will sadden my heart to lose the rooster tail that the old RODNEY was famed for. (Even though it was unrealistic and incorrect to see the 24 knot RODNEY overhaul the 27 knot ALABAMA.) The 1986 speed rules are better for our hobby, even if they aren't good for my RODNEY.

"CHAMPAIGN" CHANGES

Chris Pearce's and my proposal in the February HULLBUSTERS to try Campaign battling at the 1986 Nats has been generally been met with favorable comments. Already we are proposing several changes and clarifications to our original proposal. Rookies are eligible to participate as battlers not just convoy ship drivers. Join in the fun (slaughter). My thoughts are that campaign points will count toward the Von Fluegel Trophy, but not toward the High Sortie Awards as there are no sorties as such in the Campaign scenario. Convoy ships will be limited in speed to 15 knots.

JAPANESE FLEET

The announcement in the February HULLBUSTERS by Foster and Haynes that a Japanese fleet has been formed (at least on paper) deserves some comments by me. They announced that they reserve the right to join any fleet that they decide. This is true if they organize a Japan vs. England battle, or a Japan vs. Germany battle, but I am serving notice here that a battle announced as an Allied vs. Axis affair leaves the Nips two choices -- fight with the Axis, or sit out the fight. You all know that I have always supported battles between Blue Fleets and Red Fleets, British vs. Italians, etc. if those sides were agreed to by the battlers. However, if the majority of captains vote to align a battle as Allied vs. Axis, the Japanese must be considered as Axis -- or absent. If the Japanese sail with the Axis fleet and attack Axis ships, that is an inter-Axis squabble, and must be solved by the Axis Fleet Admiral. (We Allies always knew that there was and is no honor among Axis!)

1986 NATS SHIPS

From what I can gather from my winter tapes, 1986 will see even more battleships on the pond at Nats. As I've mentioned already we are building a new RODNEY II (Mary Hamilton will campaign the old RODNEY after Dan has repaired her). Steve Milholland and Jim Lisher will battle using two new SOUTH DAKOTA BBs (ALABAMA and INDIANA). Dan Hamilton has a NEW YORK and is building a VALIANT that may be ready for NATS. Marty Hayes and Rick Schultz from Maryland will be campaigning BBs (Rick with a MASSACHUSET?). Bob Amend has a COLORADO and rumor has it is building another BB. I hope Jeff West returns with the WISCONSIN in 1986; with the speed rules she could be awesome. Steve Milholland has told me that Dan Dees will be coming to Nats in 1986! With Dan and Jeff there, we'll all have to spruce up our ships to avoid embarrassment. On the Axis side, Carl Camurati, Joe Vilar and James Foster are building Vittorio Venetos (which I call "V Squares"). Martin Schneider is detailing superstructure in an attempt to finally winning Best of Scale after being just edged out last year by the WISCONSIN. All Allied captains hope that Jeff Lide will bring the YAMATO.

From my Ultra intercepts I feel that the following captains will be fighting with cruisers as their warships: Fluegel, Terry Darby (who is now located in Oregon -- stay with us, Terry), James West, David Haynes, Chris Pearce, Wayne Stevenson, Brian Schneider and me. As I hear it, the Father of RC Combat will captain a light cruiser in 1986 to buck the trend to BBs.



If the Springfield, Missouri Club new members construct as many ships as rumors have it, there should be a sizeable Rookie Fleet. Curly Barrett from Minnesota will be a Rookie; he has built a German cruiser. Dan Hamilton has some rookies in the Deep South who may make it to Nats. So, the 1986 Rookie Fleet will probably be at least as large as last year.

AWARDS

I erred in the February "Nats to You" column when I described the awards at the 1986 Nats. The description of the Best of Scale awards, the Von Fluegel award and the Rookie of the Year award requirements were correct, but the High Sortie Average awards were incorrect. An award will be given in each of the 8 ship classes for the ship with the highest sortie average during Nats. The rules state that at least 3 ships in a class must meet the battling requirement (number of sorties) for an award to be given. The number of sorties that are required for a ship to be eligible will be determined at the Captain's Meeting on Sunday night. The rules provide that if the number of ships in a particular class are below the required number, those ships move into the next higher class for award purposes. For example, if there are only 2 Class 8 ships present who meet the sortie requirement, those Class 8 ships get added to the Class 7 eligible ships for award purposes. Read the rules (as I should have) for all the details concerning awards and requirements.

ACCOMMODATIONS

Now is the time to make reservations at the Battlefield Inn in Springfield. Their telephone number is (417) 883-1340. Call them for a weekly rate and save money. All the beautiful Allied people will be staying there. (The Axis will again camp in the US Civil War Cemetery at the edge of town -- bring your own kraut and beer as Fluegel is not buying.)

NATS SCHEDULE

The tentative weekly schedule is shown below. Changes will be considered as the will of the battlers is known.

SUNDAY	Open Pond & Testing (AM & PM) Captain's Meeting (Evening)
MONDAY	Fleet Battles (AM & PM)
TUESDAY	Fleet Battles (AM) Campaign Battle (PM) Rules Meeting (Evening)
WEDNESDAY	Rest & Relaxation (AM) Small Ship Battles (PM) Night Battle (Night)
THURSDAY	Fleet Battles (AM & PM)
FRIDAY	Fleet Battles (AM) Open Pond (PM) Awards Banquet (Evening)

Entry forms will be mailed out in the next month. Return the form and the ship data sheet to me, and make your check payable to me (not the club). How else can I pay the hobby shop?

See you at Nats!!

Tom Jass
Tom Jass

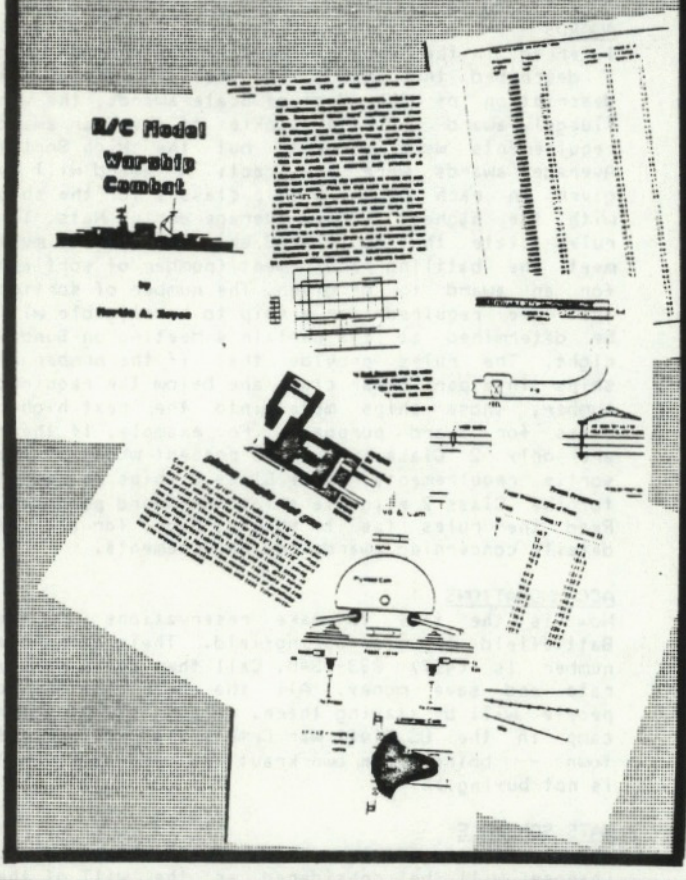
Rule Proposal

By D. W. Fluegel

The minimum range a bee bee may strike the water (fired from the ship, dead in the water) is 4 feet.

A BEGINNING MANUAL FOR

R/C COMBAT

R/C Warship Combat Types
By Fluegel

The purpose of this list is to unite "Combat neighbors". The list includes phone numbers when supplied on the H.B. subscription form. Most of the names do not participate in a battling way but have shown significant interest. I think you should get together. The numbers beside some of the names represent our current executive board. 1. President 2. Vice President 3. Contest Director 4. Treasurer 5. Secretary 6. Hero 7. People you should talk a tape to.

JOHN RHODES
3164 S. GLENHAVEN
SPRINGFIELD MO 65804

RAY HURTADO
2323 WELLS BRANCH PKWY
C-203
AUSTIN TX 78728

MOM POINDEXTER
3600 N.E. 22ND
AMARILLO TX 79107

GERALD ROBERTS
918 W. LAKESIDE LOT 5
CORPUS CHRISTI TX 78418
512 937-2972

DON JACKSON
1314 WITHERS
AMARILLO TX 79108

LOY RASMUSSEN
P. O. BOX 32
LEESBURG AL 35983

EDGAR ROISON
520 E. OGDEN AVE.
NAPERVILLE IL 60540

DICK HARGRAVE
7012 CLAIRE AV
RESEDA CA 91335

MICHAEL S. REHBEIN
1327 GARFIELD
ALBERT LEA MN 56007

ROBERT ROSE
2035 SUMERSET DR.
BEAUMONT TX 77707
404 866-5042

ROBERT HARRIS
87-650 HAKIMO RD
NANAKULI HI 96792

JOE REICH
117 WALSWORTH RD.
WADSWORTH OH 44281
216 334-1902

DAVID D'ORRYCOTT
4514 23RD ST
LUBBOCK TX 79407
415 676-7898

R. DALTON
123 E MAIN
REAR
PALMYRA PA 17078
717 838-9873

TERRY DARBY
P. O. Box 1064
CAVE Junction
OR 97523

TOM DARBY
RTE 2 BOX 464
INMAN SC 29349

WILLIAM DAVIS MM2
USS TANTOG
SSN-639
FFO SAN FRANCISCO
CAL 96679

GILBERT DAWSON
15424 CIRA VALE
HOUSTON TX 77083

DAN DEES
11084 SW 81 ST
TIGARD ORE 97223
503 620-1275

FREDRICK DELAROSA
2424 S YORK #201
DENVER CO 80210

JOHN DELAY
104 QUINAPORT ST
JEFFERSON MA 01522

MICHAEL W DESKIN
101 N. MAIN
GREENVILLE OH 45331

CHARLES GONDER
G BENJAMIN ST.
GLEN HEAD NY 11545

ROBERT GRIFFIN
7727 BLACKBERRY
ANCHORAGE AK 99502

PAUL GROSINSKI
1752 BURNET AVE.
UNION NJ 07083

KENNETH GUTWEIN
3360 SECOND ST.
OCEANSIDE NY 11572

EDWARD HAAS
4882 TRIGO RD
GOLETA CAL 93117
805 968-7534

BILL HAHN
28 DWYER RD.
WAYNE NJ 07470
201 694-8904

EDWARD HAIGH
1311 WORKEIM DR.
PHOENIX AZ 85013

RUSSELL HALSEY
RR2 BOX 105
BROWNSTOWN ILL 62418

DAN HAMILTON
RTE 3 BOX 558
DECATUR AL 35603
205 355-1563

HOWARD HARDY
6117 VALARIE LANE
SHREVEPORT LA 71107

MARTIN RUDHOLZNER
1632 N. KERR AVE.
WILMINGTON NC 28405

JAMES RUNYON
400 SKYLINE PARK DR.
HOPKINSVILLE KY 42240

JOE SALINI
P O BOX 643
SAN JUAN CAPISTRANO
CA 92693

EDWARD SAUR
46 WHITE MEADOW RD
ROCKAWAY NJ 07866

DICK SCHLEITWEILER
2400 D ST.
BELLINGHAM WA 98225

LARRY SCHMID
BOX 302
TUCKAHOE NJ 08250

MARTIN SCHNEIDER
3518 RUSTON
AMARILLO TX 79109
806 355-6393

RICHARD SCHULDZ
2161 S 75TH ST.
WEST ALLIS WI 53219

RICK SCHULTZ
RR 1 BOX 263K
QUEENSTOWN MD 21658
301 827-7491

STEVEN SCHULTZ
22511 MASCH
WARREN MI 48091
313 756-9058

DON W. SHANKS
2604 AVENUE G
LUBBOCK TX 79404

DAN SHEPARD
1414 E. MAIN
SANTA MARIA CA 93454
805 925-2637

RANDY SICKBERT
RTE 3 BOX 40
FERDINAND IN 47532
812 367-2169

ARON SIEBEL
714 SALERNO
SUGARLAND TX 77478

RICK SIEMPERT
910 ELMDALE AVE
GRAND RAPIDS MI 49505

V. SMART
RTE 7 BOX 744
ALVIN TX 77511

LEE F. SMITH
RTE. 3 BOX 37
WILLOW SPRINGS MO 65793

BOB SPYCHALSKI
6050 AIRPORT HGV
APT 5
HOLLAND OH 43528
419 866-6780

NICHOLAS STARACE
EXXON INTL CO
220 PARK AVE
FLORHAM PARK NJ 07932

RAFAEL STEINBACK
444 W. 49 ST. APT 62B
NEW YORK CITY NY 10019

STEVEN WEILNAU
12114 ARLINGTON RD.
BERLIN HTS OH 44814
419 491-4135

J. A. WEST
2094 SW PITTS TERR.
STUART FL 33497
305 283-3960

JAMES WEST
1255 IRIS
AMARILLO TX 79107
806 383-0566

ERICH WETZEL
3138 MAURY
ST. LOUIS MO 63116

KEITH WEXLER
1082 MELVIN DR.
HIGHLAND PARK IL 60035

ROBERT WILKS
1603 NORTHLAND AVE
LAKEWOOD OH 44107

MICHAEL WILLIAMS
1058 VAN NEST AVE.
BRONX NY 10461

THOMAS WILLIFORD
3403 41ST STREET
SAN DIEGO CA 92105

HTC GREGG YALE
USS TICONDEROGA CG-47
FFO NEW YORK NY 09583

GREG YALE
3208 DIAMOND EIGHT TER
APT 101
ST ANTHONY MN 55421

DALE STEPHAN
RTE 1 BOX 270
NEY OH 43549
419 658-2023

WAYNE STEVENSON
6134 THIN OAK DR.
GREENDALE WI 53129
414 421-5743

LEON STONE
414 W. BROADWAY
PRINCETON IN 47670
812 386-7272

GARY A. STRYZ
3158 MAETERLINCK AV
TOLEDO OH 43614

GEORGE THOMSON JR
7982 DAGGET ST.
SAN DIEGO CA 92111

JEFF TRNAUSKY
1300 ADAMS AVE #20
COSTA MESA CA 92626

PAUL TURNER
50 HILLVALE DR
CLAYTON MO 63105

J. TURNER
2203 LEMON GROVE
SPRING TX 77373

LARRY UCENY
915 GOLDEN
SOUTH BEND IN 46616

GLENN VAN COTT
32 GROVE ST.
COLD SPRING HARBOR NY 11724

HARRY DEVEAU
154 ASHLAND AVE
BLOOMFIELD NJ 07003

R. A. FABIAN
RR 2 BOX 69
PEOTONE IL 60468

J. P. VANDOER
614 18 AVE.
JACKSONVILLE BEACH FL
32250

HELMUT KRUEGER
FOUR A'S INC.
583 BROADWAY
WESTWOOD NJ 07675

LOUIE LOUCHANT
8238 BARKWOOD DR.
NORFOLK VA 23518

ERIC NOBLE
32782 BRIARWOOD
AVON LAKE OH 44012
216 933-5848

R. DIETZSCH
532 HIGHLAND TER
BRICK TOWN NJ 08723

SEAN FINDLAY
12609 146 ST. E.
PUYALLUP WA 98374

JOE VILAR
3912 LIBERTY AVE
NORTH BERGEN NJ 07047

THOMAS LANE
1084 MELROSE AVE.
ALAMEDA CA 94501

BOB LYON
1016 E. 36TH PL.
TULSA OK 74105

DOMINICK OLIVITO JR
74 PENNEY RD SW
CARROLLTON OH 44615
216 627-5251

JAMES P. DIGG JR
614 S 14TH ST
SAN DIEGO CA 92113

MICHAEL FIRESTINE
PSC #1 BOX 3937
APO NEW YORK
NY 09127

BUDDY WALDRIP
1603 MILLIGAN ST SW
DECATUR AL 35603

LAWRENCE LAWLESS
RTE 3 BOX 1194
CRETE IL 60147

GORDON MACKAY
416 N. FOREST ST.
BELLINGHAM WA 98225

DAVID J OSWALD
3209 TRAVIS CT
LEXINGTON KY 40502

FRANK DOONAN
107 RANDOLPH DR
DANIELS WA 25832

PAUL H. FLEMING
PO BOX 949
616 HARBOR WA 98335

WALLY WALES
1800 GREENWOOD RD.
MCKINNEY TX 75069

JOHN LAWRENCE
104 PARK AVE.
MORRIS IL 60450

LARRY MANOFSKY
8736 WIMBLETON
KNOXVILLE TN 37923

TOM PACE
5142 LELAND
AMARILLO TX 79110

BRIAN EASTIN
147 MOORE RD
COPPELL TX 75109

PAUL FLEMINS
210 RICE
LITTLE ROCK AR 72205

OTTO WALINSKI
HOBBY CENTER
WESTLAKE MALL
ABILENE TX 79605

CHRIS LAWSON
BOX 144
SPARTA MO 65753
417 278-4353

KEN MATASSA
2784 CIBOLA AVE
COSTA MESA CA 92626

PAUL PARISOT
1615 TRAILRIDG
ARLINGTON TX 76102
817 261-7965

TOM EGELSTON
PO BOX 469
SNYDER TX 79549

⑥
D. W. FLUEGEL
3524 GRAY DRIVE
MESQUITE TX 75150
214 681-9471

KEVIN WALKER
6156 N. LOMA
TEMPLE CITY CA 91780

BOB LEMASTER
118 SHADY BROOK
DICKSON TN 37055

MIKE MAURRY
RTE 1
FAIR GROVE MO 65648

JON PARK
5146 W BLOOMINGDALE AVE
CHICAGO IL 60639

DAVID EKKER
119 S DODSON
URBANA IL 61801

MOM FLUEGEL
RTE 5 BOX 508-
AMARILLO TX 79118

BRAD WALTERS
2024 WOLCOTT WAY
MODESTO CA 95355
209 577-3359

JEFF LIDE
5414 CORONADO DR.
GARLAND TX 75043

E. L. MC COY
117 E. MORNINGSIDE ST.
LONG BEACH CA 90805

SHOT PATTER
P O BOX 1126
616 HARBOR WA 98335

W.E. EKSTRUM
6350 ADLER SUITE
HOUSTON TX 77081

ROBERT FORBES
FORBES BLDG.
60 FIFTH AVE.
NEW YORK NY 10011

STAN WATKINS
7700 LANGST
AMARILLO TX 79110
806 353-6007

SCOTT LINDQUIST
PO BOX 5004
HOPKINS MINN 55343

DAVID MC MILLAN
1500 BOBOLINK DR
WASHINGTON IL 61571

CHRIS PEARCE
146 N HAYES
LAPEER MI 48446
313 664-4629

CAPT DAVID EVANS
110 AUSTIN LOOP
FT BENNING GA 31905

TIM FORBES
366 BROADWAY
NEW YORK NY 10013

DWYER G. WEDVICK
10 BAY ST
SUITE 82
WESTPORT CONN 06880

JIM LISHER
836 S BELLCREST
SPRINGFIELD MO 65802
417 831-0929

PATRICK McGRATH
50 TANGER RD
MONROE NY 10950

DARELL C. PHILLIPS
141 GRANDVIEW TERR
LONGVIEW WA 98632

WILLIAM EVERETT
2401 GAIROLOCH DR
EL PASO TX 79925

ROBERT FORST
9080 ASPEN DR.
THORTON CO 80229

DOUGLAS WEED
2909 VICTORIA CT.
NAPA CA 94558

RAY LITTLEFIELD
2102 LEWIS AVE
210N IL 60099
312 746-1306

JAMES MERSON
PO BOX 611
BRECKENRIDGE TX 76024

RONALD PICARD
630 BACON RD
SAGINAW MI 48603

DAVID ZIEGEN
W 164 N 9110 WATER ST.
APT. 5
MENOMINEE FALLS WI 53051

③ ⑦
TOM & JOHN JASS
312 E. CIRCLE AVENUE
LOMBARD IL 60148

STEVE METZLER
2608 LONE PINE RD
FARWELL MI 48622

JAMES FOSTER
RTE 1 BOX 325C
SPARTA MO 65753
417 278-4378

LARRY BRUCE
577 WILLIAM ELLERY ST
ORANGE PARK FLA 32073

DAVE ZIEGENBEN
5600 HOLLYVIEW #76
HOUSTON TX 77091

JAMES JENNINGS
602 B CHATUA DRIVE
HUNTSVILLE AL 35601

④
STEVE MILHOLLAND
RTE 2 BOX 81A
SPRINGFIELD MO 65802
417 869-0025

JOSEPH P. FOXWORTH
2890 JACKIE LANE
ATLANTIC BEACH FL 32233

B.A. BRUM
714 ATLANTIC
BETHELEM PA 18015

MN SRC CAPT D. A. PIERCE
332 MERVILLE GARDEN VILLAGE
NEWTON ABBY
CO ANTRIM N. IRELAND BT37 9TU

TIM JOHNSON
423 TOLUCA
ALLIANCE NE 69301

M.J. MITKINS
9146 CHAMBERLIN
DETROIT MI 48209

BILL FRIEDMAN
6713 KAWANEE
METAIRIE LA 70003

VAN BUFFALO
53 TALLYHO
LITTLE ROCK ARK 72207

JEFF, KAY & LADONA POINDEXTER
PO BOX 9860
AMARILLO TX 79105

NEIL JOSLUN
1503 JENKINSON
WAUKEGAN IL 60085
312 249-2678

RICHARD MOORE
PO BOX 156
HATFIELD PA 19440

WARREN FULKS
1428 NORTH TRAIL
CARROLLTON TX 75006

SALVADOR CALCAONA
9455 HIDDEN VALLEY
BEVERLY HILLS CA 90210

JOSEPH HASH
USS AJAX AR-6
FPO SAN FRANCISCO CA 96635

MICHAEL JAY KELLY
140 ENSENADA
CARPENTERSVILLE IL 60110

ARTHUR MORGENSTERN
16043 TULSA ST
GRANADA HILLS CA 91344

THOMAS FUNK
2805 SANDERS AVE
BREMERTON WASH 98310
206 373-5778

①
CARL CAMURATI
69-52 181 ST
FRESH MEADOWS NY 11365
718 762-2512

MARTIN HAYES
1113 CRESTVIEW DR.
ANNAPOLIS MD 21401
301 757-5593

SCOTT KILBURY
103 FOREST HARBOR DR
HENDERSONVILLE TN 37075

STEWART MUNGO
212 RUNAGHEDE DR
COLUMBIA SC 29210

JESSIE FURQUERON
12484 ABRAMS RD.
NO. 2301
DALLAS TX 75243

JAMES E. CARTER
47 CAMARDO DR
WAREHAM MA 02571

②
DAVID HAYNES
4154 RUSSELL
ABILENE TX 79605
915 698-8654

FRANK KNAPP
1701 E. FARRALL #75
SHAWNEE OK 74801

DENNIS MURPHY
3526A LANDSDOWNE DR
LEXINGTON KY 40503

P. FUTSCHIK
60 PARK ST
SOUTH YARRA
3141 MELBORNE AUSTRALIA

RICHARD CHRISTENSEN
523 PRAIRIE ST
ST CHARLES ILL 60174

CRAIG HEADAU
1303 IVY RD
APT 62
BREMERTON WA 98310

WADE KOEHN
5105 1/2 PAINTERS
NEW ORLEANS LA 70122

TED NEAL
1820 FIELDCREST DR
OWENSBORO KY 42301

BILLY GAINER
1023 D 14TH
AMARILLO TX 79101

JOHN CICCONE
B 703 1435 4 ST SW
WASHINGTON DC 20024

ROY HILL, SP
733 GREENLAND WAY
GRAND PRAIRIE TX 75050

E. E. KOEHNE
4905 PARIS DR.
GODFREY IL 62035

GAYLON NEPPER
PO BOX 8447
AMARILLO TX 79114

DR. DAVID GARRETT III
101 BARBIE
ROGERS AR 72756

TED COOPER
911 PIEDMONT
SUGARLAND TX 77478

ROBERT HUGHES
217 ARROWHEAD
NORTH AURORA IL 60542

D.F. KREIDL
MARATHON, ONTARIO
POT 2E0 CANADA

D.D. NEWCOMER
USS CONSTELLATION
CVA-64 (A-DIV)
FPO SAN FRANCISCO CAL 96635

RALPH E. GIBBONS
1391 E. 8685 S
SANDY UT 84070
601 561-8135

DOUGLAS L. CRONKRIGHT
1816 C CHINGUAPIN CT
CONCORD CA 94521

Rule Proposal

1) We propose that there be a five year moratorium on any and all rule changes (excepting the following three specific exceptions), effective from adoption by majority vote at the 1986 rules meeting until the 1991 rules meeting. This moratorium can be overridden by a unanimous vote at any rules meeting during following National Championship events.

EXCEPTIONS:

- 1) The current contradiction in superstructure construction/damage must be corrected.
- 2) Any rules dealing with the Convoy/Campaign event.
- 3) Any rules dealing with safety.

James E. Fort
Steven D. Milholland
Tom Leahy

PRESIDENTS' COLUMN

First off, send in your dues for the club (\$8.00) to our treasurer, Steve Milholland. Next is your insurance. Poor communication in the past has damaged our credibility with NAMBA. I am going to continue to talk to NAMBA and their R/C combat representative, in order to try to salvage what may be good insurance. But things to date have not gone too smoothly. The remaining major problem is in the spectator area, (it's distance and height from the water's surface). Additional signage and possibly "loaner safety glasses" for spectators may be enough to have our present insurance count. But the cost of this hardware is not totally covered by our dues and event entry fees; private contribution and donations are therefore necessary. If the club had a stock of 30-50 pair of inexpensive shop glasses and a few signs that stated that the glasses should be worn, our insurance problems would be greatly reduced but not cured.

There are two other avenues to liability insurance and these are through IMPBA and the NRA. One problem that we have had in the past when trying to insure our hobby is that we went to insurance companies that insured modelers. These companies are not very understanding when it comes to projectiles and the current problems reflect this. I have contacted the NRA and I will get a copy of their insurance and see if we fit their qualifications for an "air gun club". This is the most hopeful lead I have gotten so far, and I hope it works out. IMPBA is another modeling club and I will investigate their insurance and get whatever information I can about their coverage and costs.

David Haynes and Steve Milholland are both researching the possibility of having our club incorporate. This will give future executive boards immunity from liability at a combat event.

Now for the really bad news, you will probably have to join NAMBA this year. With the Spring Regional in Decatur around the corner, we have only one choice. Besides, Dan and Mary advanced cash for the lake insurance (\$105). Please try your best to get there so that both the cost and the fun can be spread between many. I will do my best to get a day or two off so that I could get to Alabama for the Spring Regional. So in closing send your hard earned money to Steve Milholland and he will forward it to NAMBA.

Club Dues....	\$8.00	Steve Milholland
NAMBA Dues....	\$25.00	Rt. 2 Box 81A
Total.....	\$33.00	Springfield, Mo. 65802

PS- If you also want to make a donation to the safety glass fund, please send your money or glasses to Steve.

Carl Camurati

NEWS FROM THE NORTHEASTERN REGION

We have been experiencing a period of hard water which I'm sure does not surprise anyone, so all of the activity has been in the ship yards. From N.J./N.Y. area, grumbings of the building of large Italian Battleships continue. I do not know how complete they are or when they will be ready for sea. From the Boston area, the last work I had was that an American Battleship was ready for sea (and battle), but Adm. Amend was then sent on an all experience paid cruise of the Caribbean, thanks to the US Coast Guard, and has been out of touch. In the Maryland area, the *BB Maryland* is now reported ready for sea, the *HMS Warspite* is still undergoing repairs and modifications, the *USS Quincy* and *FNS Richelieu* are in the ship yard waiting their turn on the ways. The *USS Colorado* is said to be more ready for battle and ready for the water. Nothing has been heard for Mike Deskin (who was tainted last year by contact with the Axis) and now lives rather far afield in Ohio.

In Maryland, we have started meetings to interest other modelers in building combat ships and we have had some success along this line. We have held one meeting a month since January and the attendance has gone from 4 at the first to 7 at the March one. Some construction has been done but at this time I'm not sure if any of these ships will reach the water in the coming combat season. Some of the ships under construction (in some cases just started) are an Iowa class BB, a Baltimore class CA, two St. Louis CAs, and a South Dakota BB. The next meeting is scheduled for April 5 and we plan to get out to the lake on one of the next two weekends for an operating session and give the newer captains a chance to control a combat ship underway. A local hobby shop now has a copy of some of the action at National (85) and plays it on his VCR in the shop.

Don't forget the upcoming regionals in Maryland, we hope to have a good turnout which should help us in our recruiting drive. Our regionals is scheduled for the first weekend in June. We are also able to provide workshop space at my new garage and for those who want to save money on accommodations we can offer sleeping space for sleeping bags in the attic of the garage and a few in my RV. For information on the Regionals contact Rich Schultz (301) 827-7491. For pre-reg. and information packets (including maps, and hotel information), send eight dollars to Rich Schultz, RR#1 Box 263K, Queenstown, Maryland, 21658. Reg. after May 15th will be twelve dollars. The Axis have always ruled the Northeast, although their lead has been cut during the last year, and this is the year in which we intend to make them eat our dust (or should I say drink our lake water.)

Capt. Marty Hayes,
 HMS Warspite

Typos Here There And Everywhere

I know you've seen David's article on the Bis-marck speed typo. Well as you also know I did the original ship list at over fifty pages or so hand written that was sent to Tom, who then printed it into the computer. We then sent copies back and forth weeding out typos but the more we weeded the more crept in. Finally we needed to send it to that dirty Axis I mean Fluegel so that everyone could see the information they needed. Anyway Tom deserves a big hand for typing it for us. One big problem for him was reading my script and trouble with foreign names He'd never seen before especially the older ships. Anyway I found more typos they are the Japanese Light Cruiser Katori's speed should be 18 knots not 15, the Japanese Heavy Cruiser Tone's speed should be 35 knots not 34, and the British Queen Elizabeth class Battleships have five ships in the class not four. Also the parts of the list that have been published only barely scratches the surface of the full list as there all kinds of ships such as Armed Merchant Cruisers, Destroyers, Escort Carriers and Monitors to name a few plus a dozen or more other countries that have Naval forces in this period so poor Tom still has a awesome typing job ahead. I personally hate typing so this article is over.

by Dan Hamilton

Dan

RELIABILITY

By Tom Jass

During the past 2 1/2 years that I've been involved in the "magnificent obsession" one major fact has been driven home time and time again. To be successful in this hobby one must have a ship that is RELIABLE -- that is, one that functions correctly 95% of the time in battle. Everyone talks about reliability but no one has written a HULL BUSTERS article about how to attain that goal. I will take pen (word processor) in hand and give it a shot.

The ships I have built have been, on the whole, reliable. Perhaps a great part of that success was due to my overall Guiding Principle -- the KISS principle. KISS stands for (among other things) "Keep it simple, stupid". That is excellent advice for you as you attempt to build a new ship or modify an existing one. Complexity kills just as surely as BBs do, and you are the enemy when you build too much complexity into your ship. At least the BBs come from the enemy. Listed below are some of the common systems that go into the construction of a R/C Warship. I will give you my opinions concerning how to construct or purchase these systems so that they will be reliable and increase your chances of enjoyment and success in this crazy hobby.

HULL

There's not a great deal you can do to make a hull a more reliable system; however, I'll list a few hints that you can consider. Use the rules to the fullest to take advantage of every situation. For example, don't sheet your entire hull with 1/32" balsa wood. Use plywood or thicker balsa to skin the hull areas that are 1" below the water line. Its easier material to work with and, more importantly, you won't get exit holes below the water line that will sink you. And not sinking is called reliability. Use the same balsa blocking for the hull skin 2" behind the bow and 1" ahead of the stern. Use aircraft plywood for the formers; don't use paneling or balsa wood. Your ship will be reskinned during its career. An aircraft plywood frame will be durable. Be extremely familiar with the rules -- don't cheat, but don't give away reliability just because you're ignorant (like DWF) of the rules.

GUNS

Guns are the single most important system in your ship. Without reliable guns your ship is like a transport ship in a convoy battle. At this point I'll give you Jass Rule #2 (KISS was Rule #1). If you can't make a successful (reliable) system BUY IT FROM SOMEONE WHO CAN. I feel that the Foster gun is such an advance over preceeding guns that you must have one (or a good Geek gun) if you wish to be competitive. Try to make one yourself after seeing one; but if it doesn't work 100%, call Foster and fork over the dough it takes to buy one. Why invest \$200 to \$300 in a ship and go out with unreliable guns when for \$10 (or so) you can be effective? That's penny wise and pound foolish. The same principle applies to singleshot gun valves. Try to build a ball bearing or a Camurati valve (warning: Carl's valve requires a lathe to build correctly), but if yours isn't first-rate, call the experts.

PUMPS

The pump(s) and the pump activation system are the second most crucial component. I'll now introduce Jass Rule #3. If you can't design an original system that's reliable, STEAL SOMEONE ELSE'S DESIGN. Milholland's Penny Pump and Foster's Turbine Pump both are proven in battle and are reliable. Articles on their construction have appeared in HULL BUSTER and that's your source for all the designs you will steal. Also, Fluegel and others have published articles on pumps that are reliable. Fluegel has a "See and Say" tape and

planaset that tells how to make a Jass-modified Penny Pump that has kept our ships afloat in some furious battling. Don't be too proud to acknowledge that someone else has been able to develop a system that's more reliable than your system. If their's is better, use it! Proud, stubborn people (Germans) have ships that sink. If you truly feel that you have a new pump design (or any other design) that will be more effective and reliable than any on the scene, test it over the winter and introduce it in one of your ships. But thoroughly test it before you replace a system that already works.

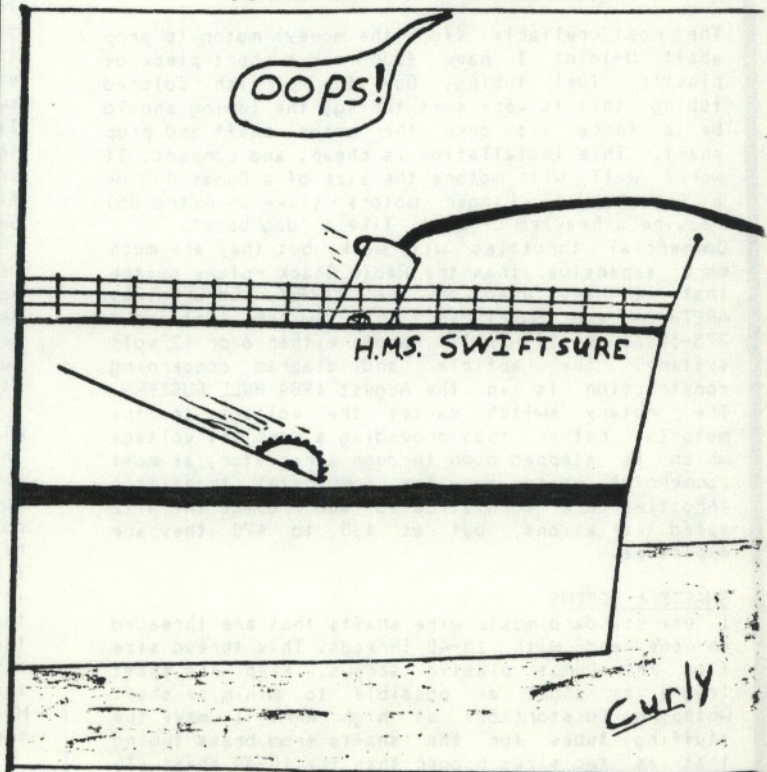
The activation system must be as reliable as the pump(s). If the pumps eject 5 gallons per minute but don't turn on, they are zero gallon per minute pumps. I have used a mechanical pump activation system for all my ships. Automatic activation systems are OK if they work. Float switches do not work well enough to be used as the sole activator. The automatic Xistor circuit can be reliable, but the circuit and relay must be in a watertight container. The use of 2 or 3 activation systems in parallel violates my KISS rule.

ELECTRICAL SYSTEM

To be reliable, I feel an electrical system should be neatly installed and logically designed. We've all seen electrical systems that look like a fishing reel backlash. They are impossible to trouble shoot and difficult to repair. All your wiring should be color coded so that the "hot" and "neutral" wires are easily identified. I use 18 gauge stranded wire that is available from Radio Shack on spools. It is available with red, black and green insulated sheath. All electrical components (throttle, cells, motors, etc.) should be removable, so you must locate a source of plugs or jacks to use. If you use jacks the polarity of the wiring system will be correct as long as you always (for instance) attach the hot lead to the tip of the jack. If you use plugs, color code the plugs to insure correct polarity. I always build a wiring harness of twisted wires that connects the motors, cells, throttle and fuses. This harness is threaded through the ship's ribs via

continued on next page

ALLIES vs. DREMEL Sortie #1 Winner-DREMEL!!



Rule Proposal

By Stan Watkins

The minimum distance a BB may strike the water (fired from the ship dead in the water) is 12 feet.

1/4" holes that are drilled in the ribs. A plug (or jack) is provided in the harness at the location of each component so the component can be detached. The harness stays in the ship and out of the way during operation.

Use heat shrink tubing to insulate all exposed wiring. It is neater than a wrap of tape. You can buy it in 36" lengths at an electrical store rather than in the expensive plastic-wrapped packages at the hobby shop. Protect your fuses so that a stray BB can't shatter one and cause you to go dead in the water. Attention to the small details like this separate the reliable ships from the average ones. Usually a neat electrical installation means a reliable electrical system.

Unless you have an unusual space situation in your ship, use Gates X-cells as your power source. They provide 2 volts, 5 amp-hours per cell and have proven to be extremely reliable. They can be purchased from JerryCo (a Chicago firm) for about \$15 for six cells. These six cells can provide you with two strings of batteries -- truly a Navy "good deal".

MOTORS & THROTTLE

Several motors have proven to be reliable throughout the past years. THERE IS NO RELATIONSHIP IN R/C COMBAT BETWEEN MOTOR PRICE AND MOTOR EFFECTIVENESS. The Dumas 4.8 volt motor is cheap (\$7), but reliable. Insure that whichever motor you use can be immersed in water and still operate. Ask that question at the hobby shop before you plunk down \$60 for a "hot" motor that must stay dry to be effective. Be sure to attach capacitors between each motor terminal and the motor case. This will reduce motor/reciever interference -- its easier to do at installation time rather than after your first sinking. I feel that motors should be mounted to the hull with tie wraps or metal bands that are removeable. Don't glue the motors in, or use putty. The putty has, on occasion, gotten soft because of motor heat; the loosened motor whipping around in the hull is a lethal weapon. If the motors are glued in, field repairs are difficult.

The most reliable (for the money) motor to prop shaft U-joint I have found is a short piece of plastic fuel tubing. Buy the pinkish colored tubing that is very soft tubing; the tubing should be a force fit over the motor shaft and prop shaft. This installation is cheap, and compact. It works well with motors the size of a Dumas 4.8 or a Grasshopper. Larger motors (like an Astro 05) require a heavier U-joint, like a "dog bone".

Commercial throttles will work, but they are much more expensive than the Radio Shack rotary switch that I have used on the RODNEY, SHROPSHIRE, ARETHUSA and SWIFTSURE. This switch (Catalog # 275-1836, \$1.19) will handle either 6 or 12 volt systems. The article and diagram concerning construction is in the August 1984 HULL BUSTERS. The rotary switch varies the voltage to the motor(s) rather than providing a constant voltage which is stepped down through a resistor, as most commercial units do. The commercial transistor throttles are sophisticated and provide infinite speed variations, but at \$60 to \$70 they are expensive.

SHAFTS & SCREWS

I use standard music wire shafts that are threaded on one end with 10-40 threads. This thread size fits the Dumas plastic screws. Keep the shaft length as short as possible to minimize shaft whipping (distortion) at high RPM. I make the stuffing tubes for the shafts from brass tubing that is two sizes bigger than the 10-40 shaft. In

The Manual of R/C Warship Combat

The long threatened release of the Manual of R/C Warship Combat is now among us. More than seventy pages of information on how to build a combat ship and it's systems. This is a early release of a Xerox version of the manual, complete with all sections dealing with everything including how to build the hull, how to build the guns, with tables on freon, radio freq. and drawings of most of the details. This limited release is available for \$5.00 ea. (to gain money for a later professionally printed version.)

Tom Jass (one of my reviewers and proofreaders) said "Just what the hobby needs," and "the best thing since Hull Busters." Carl Camurati complained that it might bring too many into the hobby. Have one on hand to lend out to the rookie down the block.

Order yours today from: Martin Hayes, c/o J. Martin Publishing Company, 1106 Skyway, Cape St. Claire, Maryland, 21401.

In addition to the stuffing tube itself, I cut two pieces of brass tubing about 1/2" long; these stubs are soldered inside the stuffing tube at each end to provide journal bearings for the 10-40 shaft. Obviously the inside diameter of these stubs is the same as the outside diameter of the 10-40 shaft. I oil the stuffing tubes to provide lubrication. The shafts should be removed from the stuffing tubes periodically to be sanded and polished. This method provides a KISS shaft/stuffing tube installation.

Buy the screws you need (Rule #2) from Dumas, or better yet from Exact Miniatures. From E-M you can order right handed or left handed screws of any diameter you need. E-M will construct two or three bladed brass screws with a collar and set-screw for about \$5 each. The Dumas screws are good, the E-M screws are even better for slightly more money.

R/C INSTALLATION

So far my advice has always been to spend money (except in motor choice) to gain reliability. Well, here's a switch. I recommend Futaba R/C equipment for use in our hobby. I know that early HULL BUSTERS always bad mouthed Futaba gear as unreliable, but my experience (over 3 years) has been the opposite. The Futaba gear has been as reliable as the more expensive equipment, and the lower initial cost is a definite plus. You will save enough money if you buy Futaba to allow you to buy Foster guns, E-M screws and Camurati valves. In addition, Futaba servos, batteries and switches will often be available at sale prices. If you are purchasing a new R/C unit buy one on the 75 MHz frequency band, one that has interchangeable crystals. If you are buying your first radio buy a 4 or 5 channel unit. Don't buy a unit without the servo reversing feature.

Definitely build a water tight box for the R/C equipment. The box should enclose the reciever, servos and battery at the minimum. The box should be built of 1/16" plywood and finished inside and out with epoxy resin so that BBs don't penetrate it.

All of the servo linkages should be kept as short in length as possible to minimize slop and non-linear action. Don't tuck the rudder servo in the bow of the ship and run a 48" linkage to the rudder post. The flex in the linkage will cause reliability problems, unless you make the linkage from 1/4" solid rod. Avoid intermediate bellcranks in the linkage layout. If you require one to make the system work, redesign the system to eliminate the bellcrank. Use rubber boots rather than stuffing tubes to seal linkages where they pierce the water tight box. These boots are made by Best Models Inc., Catalog # 100, \$1.95 for a set of two.

continued on next page

TESTING

A R/C Combat Warship is a complex beast. All the systems must work together to contribute their part -- a chain is as strong as its weakest link (trite but true). The best way to increase your reliability is to approach the problem one system at a time. For example, get good, reliable motors, test them until you're satisfied, and then move on to the next system. TEST THE SYSTEMS ON THE WATER; A WORKBENCH TEST IS GOOD, BUT ONLY AS A PRELIMINARY STEP TO A WATER TEST. TEST, TEST, AND THEN TEST AGAIN.

Keep a log book for your ship (Fluegel advises this, and so do I). This log is used to record the circuit diagrams, test results, documentation, etc. that form the history of your ship. Keep notes on modifications that work and those that don't. Keeping a log will help you be logical and organized in your approach to your ship and its problems and history. Very few ships are 100% successful from their launching; usually they get better and better as they are modified and changed to reflect changing situations and battle experience.

CONCLUSIONS

My approach to solving the reliability problems that can plague a warship can be summed up with the following "rules":

- 1. Keep it simple, stupid.
- 2. Don't reinvent the wheel. Buy it from an expert. Use a proven design.

Smooth Sailing

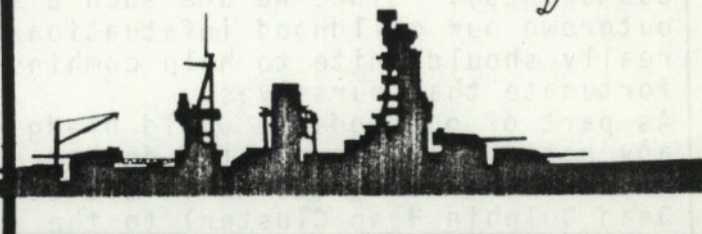
Tom Jass

Insurance

Fluegel asked me to tell you all whether to sign up for N.A.M.B.A. again this year. The answer is yes and its gone up to \$25.00 per year. Send your money to Steve Milholland our illustrious treasurer at RT.#2 box 81a Springfield Mo. 65802. Also anyone planning to saction a lake for a regionals should be aware that the fee is now \$105.00 plus \$5.00 for your contest directors license. Remember in order for to be eligible for awards, have your points counted, and have insurance your event must be sactioned. Also if you are planning a regionals be sure to contact our Vice President David Haynes. He acts as a clearin house to prevent conflicts and he has a package telling you how to handle it if you haven't had one before. Also your President and Executive Board have been looking into other alternatives for next year such as A.M.A., N.R.A., I.M.P.B.A., and incorporating the club thru law to reduce cost. Our President has also been in touch with N.A.M.B.A. several times to give our input in the question of safty in our hobby and its practical applications.

By Dan Hamilton

Dan



By Statistical Dept.

The Ballots Are In

The ballots from the December issue have been divided into two groups; have battled ; & have not battled. The actual "counts" are shown below. I see four generalities that can be made based on the votes.

have battled

#1. I am a member of the combat club in the northwest. yes 2 no 12. #2: I am a member of the "R/C Combat Club". yes 13 no 1. #3. I have battled. yes 14 no 0. #4. I read Hullbusters in public I yes 5 of course not 6. #5. I wish the ships could go faster 2 slower 4. Current rules are fine 8. #6. I think there should be greater emphasis on the non-battling aspects of the hobby. yes 3 no 11. #7 I would like to see the club dues lowered 2 raised 5 no opinion 7. #8. I believe this hobby will involve thousands of people within 20 years. yes 4 no 5 HaHaHa certainly not 5. #9 I am coming to the NATS as an Axis 7 Allie 4 not at all 1. #10. In order to increase the range of combat I would support a rule that established a minimum range. yes 5 no 7. Check the items that you feel don't belong in the hobby, #11. convoy 3 #12. Shore bombardment 5 #13. night battle 0 #14. Submarines 4 #15. Tom Jass 100.

have not battled.

#1. I am a member of the combat club in the northwest. yes 1 no 15. #2: I am a member of the "R/C Combat Club". yes 3 no 11. #3. I have battled. yes 0 no 16. #4. I read Hullbusters in public I yes 11 of course not 5. #5. I wish the ships could go faster 1 slower 3. Current rules are fine 8. #6. I think there should be greater emphasis on the non-battling aspects of the hobby. yes 6 no 8. #7 I would like to see the club dues lowered 1 raised 1 no opinion 14. #8. I believe this hobby will involve thousands of people within 20 years. yes 10 no 6 HaHaHa certainly not. #9 I am coming to the NATS as an Axis 7 Allie 2 not at all 6. #10. In order to increase the range of combat I would support a rule that established a minimum range. yes 5 no 8. Check the items that you feel don't belong in the hobby, #11. convoy 1 #12. Shore bombardment 3 #13. night battle 1 #14. Submarines 1 #15. Tom Jass 100.

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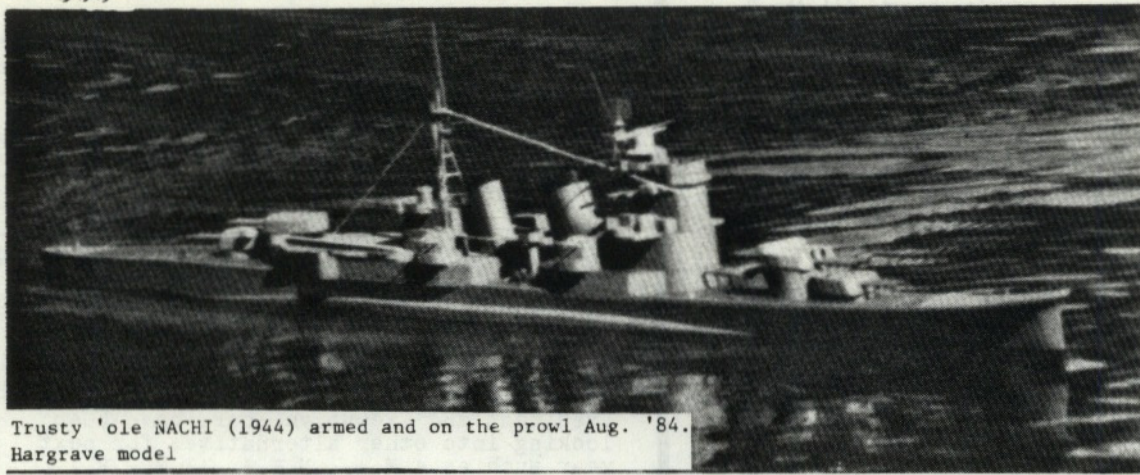
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Cut



Hull Busters

Trusty 'ole NACHI (1944) armed and on the prowl Aug. '84. Hargrave model

NOTICE: Now Forming; The United Brotherhood of Submarine Haters! It has been observed that there are a few mature Naval Enthusiasts in this club that properly share my disgust for those boats that deliberately sink themselves (they have the over glorified title of submarines). Since we are such a small special select group that has outgrown our childhood infatuations for airplanes and submarines, we really should unite to help combine our efforts to educate those less fortunate than ourselves.

As part of our code we would pledge to fire on and ram any submarine of any nationality found at a combat event. Special merit points would be awarded and our group would sponsor a special trophy and medal (The Dead Dolphin Heap Cluster) to the member who did the most damage to submarines. To inquire please write Pig Boat, Surface Forces, 00000, Sunk City, Holland

CONCLUSION: Boy, that was A Beginning Manual for R/C Combat & It's magnificent! Even us Old Salts will find it exciting reading. Its illustrations will be a useful teaching tool, you're plain "Allied Stupid" not to buy one. Well, it's time to put this rag to bed, so in closing let me say I hope to see you at Dan Hamilton's (Decatur Alabama May 3rd and 4th) regionals. God Bless you All, love Fluegel.

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