San Diego Ship Modelers' Guild

Feb. Vol. 16 No. 2 1992

San Diego Ship Modelers Guild
Mike Rivera
/redacted/

Mon	Tues	Wed	Thur	Fri
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Happy Valentines!

FRED FRAAS 90-91
/redacted/

PRESIDENT
BOB CRAWFORD
VICE PRESIDENT
BOB WRIGHT /redacted/
TREASURER
Bob Willis /redacted/
EDITOR
Mike Rivera /redacted/
COMMITTEE

BOB WRIGHT	/redacted/
ED WHITE	/redacted/
JIM HAWKINS	/redacted/
BOB O'BRIEN	/redacted/

SCHEDULE OF ACTIVITIES:

GUILD MEETING THIRD THURSDAY OF MONTH. 7:00 P.M. SOCIAL
7:30 P.M. MEETING

STATIC WORKSHOP - EVERY OTHER TUESDAY 7:00 P.M. TO 9:00 P.M. ABOARD THE FERRY BERKELEY.

R/C OPERATION- SATURDAY MORNINGS MODEL YACHT POND

ANNUAL REGATTA- THIRD WEEKEND JUNE.

MEMBERSHIP:

DUES ARE $15.00 ANNUALLY

WE STRONGLY ENCOURAGE ALL TO JOIN SAN DIEGO MARITIME MUSEUM AS AN EXPRESSION OF APPRECIATION FOR THE FACILITIES THEY PROVIDE US.

HEAT TREATING STEEL TOOLS

Chisels, Dies, Punches and Stamps

by James Austin

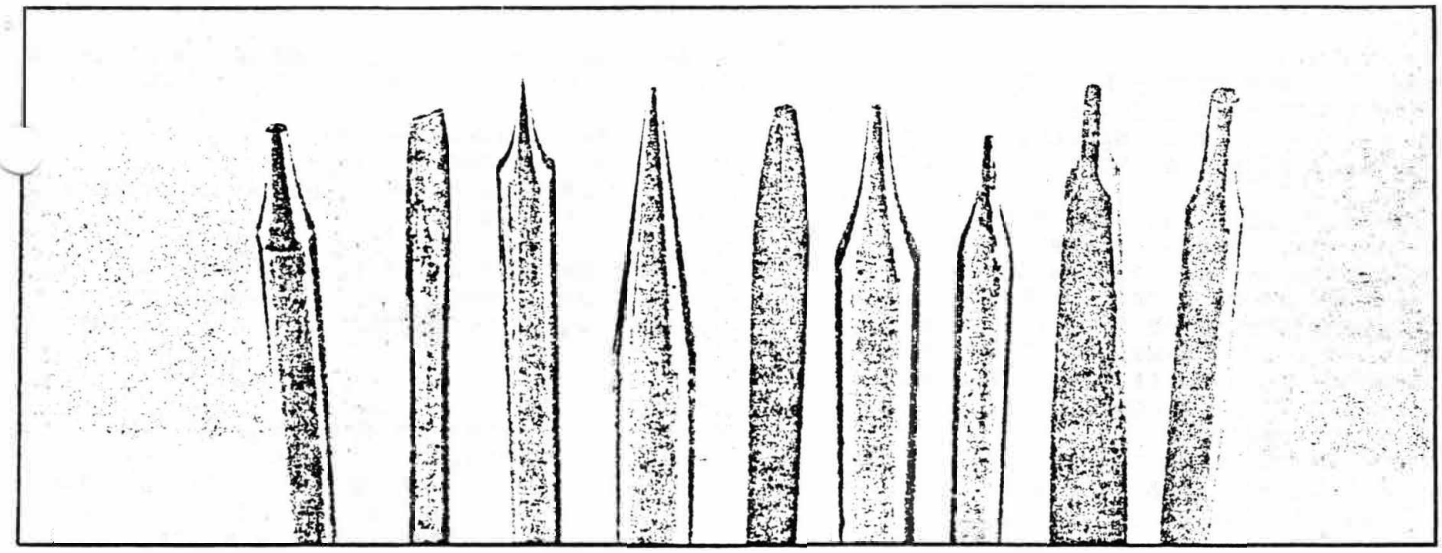
How many times have you visualized a special tool, feeling that, while you could make the tool, it would still lack the hardness or toughness it needs? Well, you *can* make it . . . without great cost or difficulty. Heat-treating steel basically requires only a common propane torch, the correct steel and, of course, the technique.

To begin, obtain a water-hardening steel in drill rod form, usually available in three-foot lengths. Be sure the tool steel is water-hardening; type W-2 (a specific alloy) is the most common. Choose a diameter from one-eighth to one-quarter inch and consider material removal; it's better to remove less. Larger diameters don't always harden correctly, so learn on the smaller material.

Tool steel, even when soft, exhibits a certain toughness; nevertheless, the modeler can saw, file and drill. The ideal final soft tool must have a minimum of sharp corners, deep scratches and thin sections, since these are all potential sources of cracks and breaks during hardening. Number 400 sandpaper is not excessive for smoothing the final surface.

Hardening The Steel

Using a torch, *o'd* pliers and a water bucket, heat the tool, then quench it immediately. If you cannot heat the whole piece (often the case for punches), heat a major portion of the shank and tip – not just the tip. Increase the temperature evenly, in a subdued light, to a bright – not dull – red hot. Ignore firescale forming on the tip and forget harmful fumes . . . none exist. For thicker sections, hold or soak the



Left to right, hex die, screwdriver, ball punch, scriber, EMD hood latch stamp, ball punch, hex stamp, round-nose chisel, hex die.

tool at temperature for, maybe, thirty seconds. Now, quench *fast* – the steel must not cool before it hits the water, for this sudden transition is what hardens the metal. Also, if you plunge our example scriber vertically into the water, you minimize warpage; plunge horizontally and you almost guarantee a permanent warp. To test post-quenching hardness, file the tool with an *old* file, which will "sing" oddly, while removing almost nothing if the steel has hardened. Go immediately to the next two steps because newly hardened steel is always glass-brittle.

Clean all firescale and oxidation from the surface, particularly from the tool's "business" end. This step is important, since you will need to see bare metal for the next step. Emery cloth (80-220 grit) works fine, though a variety of coarse abrasives work equally well. Do *not* use a motor-driven grinder on the brittle steel.

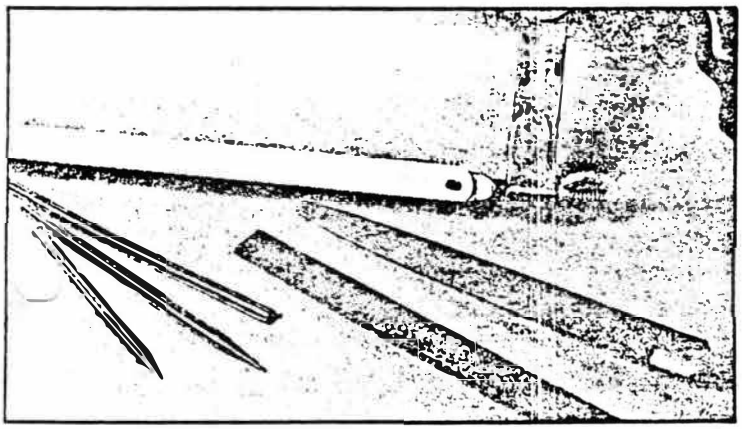
Tempering

That brittleness will be removed by drawing – or tempering – but, first, a bit of theory. Heating hardened steel to 375-650 degrees Fahrenheit removes a bit of hardness, while imparting toughness (the metal's molecular structure changes). As the temperature rises past 375 degrees, a thin, colored, permanent oxide layer forms on the steel. With progressive temperature rise, that surface turns first pale straw-yellow, then light brown, brown, purple-brown, purple, blue and, finally, gray-black. Lighter colors correspond with harder tempers while the darker ones go with tougher tempers. Gray-black, though, is just plain burnt; the entire hardening process would need repeating. Double drawing – that is, cooling, removing oxide and drawing again – imparts extra resiliency to the tool. The tempering process is not reversible; successive draws to a lighter color will not increase hardness. Also, similar to the hardening step, thicker sections benefit from soaking at temperature.

Back to the tool itself. Again, the modeler uses a torch, pliers and water; this time heating the entire tool slowly and gently. Time is of no importance, since only the color of the oxide layer matters. That scriber might be drawn to a yellow-brown color, while a screwdriver might require a purple temper. Even if one overshoots the intended temper color by a shade, the tool is usually still usable. With drawing, quenching merely cools the steel; the heat works the change. This author heartily endorses double-drawing for any hammer-struck tool. (A tool that is too hard can shatter when struck; wear safety glasses.)

Once tempered, the tool may be brought to final form by sanding, stoning or motorized grinding. Just two minor cautions: grinding generates heat, too much of which destroys temper; finally, bending a heat-treated tool to form, generally, is not possible because it usually breaks.

That's it! No great cost, no high-tech "hocus-pocus" – just the right steel, heat and technique. Some drill-rod-derived tools are not practical (a saw would be an act of insanity); however, a wide variety requires only this basic method. Reams have been written on heat-treating; the attempt here is to reduce the data to that required for this one type of steel. Once you learn the procedure, many doors will open.



Sources

Sources for water hardening tool steel include industrial tool suppliers, most of whom will sell drill-rod over-the-counter to individuals, but phone first to be sure. I purchase mine from Devou Supply Co. in Cincinnati, Ohio. Your local hardware store may carry it. Beware of the uninformed sales clerk, though, who simply tells you what you want to hear and sells you something other than the correct material. One supplier who caters to model railroaders is Blue Ridge Machinery and Tools, Inc. You can contact them at P.O. Box 536-M, Hurricane, WV 25526, or phone 304-562-3538. They accept Visa or MasterCard.

HELLO!!

AFTER THE PAST FEW MONTHS HIATUS, WHICH I WILL TRY TO SUMMARIZE IN AS FEW WORDS AS POSSIBLE, TO GET THIS NEWSLETTER OUT TO YOU GUYS AS PRONTO AS POSSIBLE.

LET ME START FIRST BY WISHING YOU ALL A **HAPPY NEW YEAR--1992**--IT MARKS OUR 16TH YEAR OF THE SAN DIEGO MODELERS GUILD NEWSLETTER AND IN THIS YEARS FIRST, I WILL COMBINE A STRING OF THOUGHTS FROM OCTOBER, 1991 TO THE PRESENT, COVERING FOUR MONTHS OF MISSING LETTERS, IN OCTOBER THE GUILD EXTENDED ITS CONDOLENCES TO THE VINCELETT FAMILY ON THE PASSING OF PHILLIP ONE OF OUR MEMBERS WHO BUILT R/C KIT MODELS, AND WAS AN ACTIVE BOAT POND SAILOR....HE WILL BE MISSED.....

IN SEPT/OCT. SAW THE BEGINNINGS OF SIX MOS. OF RESEARCH AND DEVELOPMENT FOR YOURS TRULLY WHERE THE WORK HOURS AND THE TRAVEL MILES HAVE ALL BLENDED TOGETHER INTO ONE BIG BLUR AND RESULTS OF MY PAST SIX MOS., ARE PRINTED ON PAGE 9 & 10 AND IT CONTINUES TODAY THROUGH FLIGHT TEST.ALL THIS WORK ACTIVITY HAS RESTRICTED MY MODELING TO READING AND COLLECTING STUFF FOR FUTURE DATES WHEN I RETURN TO ACTIVE MODEL SHIP BUILDING.....

I CAME ACROSS BOB DEBOW'S PHOTO IN THE SAN DIEGO READER. HOW MANY OF YOU GUYS CAN COMPARE YOUR MODELING ROOM TO HIS...

HOBBY LOBBY INTL. HAS A GREAT CHEAP CATALOG FOR $1.00, WHY DON'T YOU SEND FOR ONE, I'VE INCLUDED SOME SAMPLES OF THEIR WARES TO WET YOUR APPETITE, SHOULD YOU SEND FOR ONE LET THEM KNOW YOU HEARD IT FROM THE S.D.M.G.

JUNE 1992 IS NOT TO FAR AWAY AND THE REGATTA'92 PLANNING IS IN FULL SWING--

AND AS ALWAYS THE SUPPORT OF ALL GUILD MEMBERS WILL BE MOST WELCOME !!!! PLEASE CONTACT YOUR GUILD OFFICERS FOR MORE DETAILS... OR ATTEND THE NEXT MEETING..

ELECTIONS AT THE GUILD MEETING IN DECEMBER BROUGHT NEW OFFICERS:

BOB CRAWFORD-- PRESIDENT
BOB WRIGHT---- VICE PRESIDENT
BOB WILLIS --- TREASURER-(incumbent)
MIKE RIVERA -- EDITOR (incumbent)

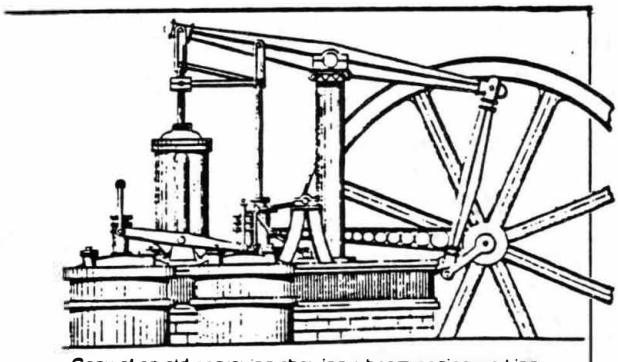
WE WELCOME BOB & BOB IN JOINING BOB & MIKE (sorry about the BOB'S) WITH THEIR FRESH IDEAS INTO STEERING OUR GUILD INTO 1992.

SOME OF THE FORTH COMING PLANS ARE---- MORE SHIP BUILDING TECHNICS, DISCUSSED AT THE MEETINGS, HISTORICAL DATA, LOFTING, RIGGING, THE EMPHASIS IS SHIP BUILDING AS A WHOLE---THIS IS NOT A NEW IDEA--- BUT OUR RETURN TO OUR ORIGINAL PRINCIPLE, SIMPLIFY---SIMPLIFLY..

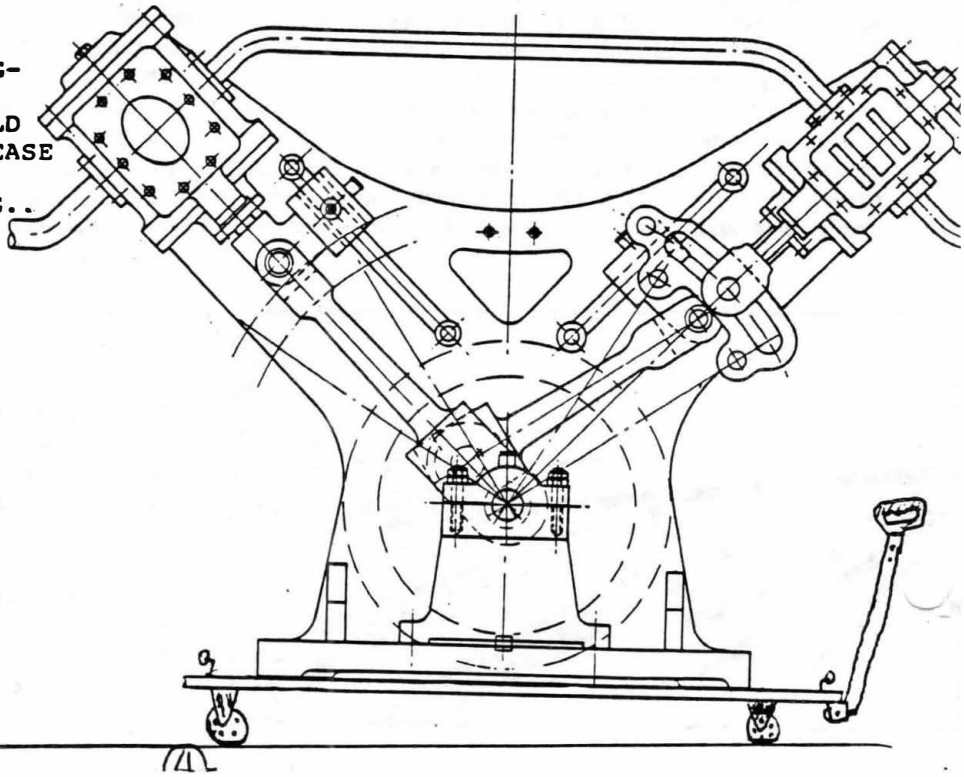
OUR MEETINGS TAKE PLACE ON BOARD THE FERRY BOAT THE BERKELEY---SO, NOW WE CAN BRING OUR SHIP MODELS TO SHOW AND TELL--WHY DON'T YOU COME DOWN ON THURS. FEB. 20TH, AT 7:00 P.M. AND SEE WHAT'S GOING ON.....

HAVE YOU SENT IN YOUR 1992 S.D.M.G DUES ? ??????

I'M ENCLOSING TWO FORMS TO FILL OUT, ONE WILL BRING OUR RECORD UP-TO-DATE, YOU CAN MAIL THEM, OR BRING THEM TO THE NEXT MEETING----THIS INFORMATION WILL GIVE US AN IDEA AS TO WHO'S BUILDING WHAT, WITHIN OUR GROUP.



Copy of an old engraving showing a beam engine working as a two-cycle Stirling engine, dating back to about 1827



San Diego Ship Modeler's Guild

MEMBERSHIP APPLICATION FORM

San Diego Ship Modeler's Guild is dedicated to the preservation and improvement of the crafts and skills of scale ship modeling. The motto of our informal monthly meetings, aboard the bark Star of India, is "Bring a Model." Many ideas, helpful hints, and methods of accomplishment are exchanged during informal discussions about the models present.

In addition to our monthly meeting, there are workshops aboard the Berkeley twice a month, sponsored by the Maritime Museum, informal radio control runs on the Vacation Island Model Yacht Basin most Saturday mornings, and annual Radio Control Regatta and Static Display contest in June. One benefit of Guild Membership is the monthly newsletter containing items of upcoming events, craft tips, and related articles. We maintain a network with other clubs throughout the United States and Canada. Our Guild shares in the operation of the ship model shop aboard the ferry Berkeley, where reference materials, magazines, and catalogs are made available to all members.

If you are interested in becoming a member of the Guild, you are cordially invited to attend one of the monthly meetings aboard the Star of India. Simply inform the attendant that you wish to attend the meeting and you will be directed to the meeting location.

Schedule of Activities

Meetings: 3rd Thursday, Star of India 7:00 pm social 8:00 pm
Model Workshop: 1st and 3rd Tuesdays, Berkeley 7:00 to 9:00 pm
R/C Operations: Saturday morning, Model Yacht Basin at the Princess Hotel
Annual Regatta: 3rd weekend in June, Model Yacht Basin at the Princess Hotel

Membership

Dues are $15.00 yearly and we strongly encourage all members to join the *San Diego Maritime Museum* in return for the facilities they provide the club. Please make payable to *The San Diego Ship Modeler's Guild* and mail to:

Robert K. Willis
/redacted/

If you would like a Guild name tag please make check out in the amount of $5.00 to Henry S. Wenc and mail to:

Henry S. Wenc
/redacted/

I would like my Name Tag to read "_____"

Personal

Name _____

Address 1 _____

Address 2 _____

Address 3 _____

City _____ State ____ Zip Code _____

Res. phone (___) ___-____ Business phone (___) ___-____

Occupation _____

Office Use Only
Member ID #

If you have any questions, please feel free to call me at home.
Russ Lloyd
(619) 275-2809

Model Information →

Model Specifications

	Ship's Name	Country of Origin	Hull Number
1.			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			

Model Specifications (continued)

	Classification	Categ.	Power	Method	Hull	Manufacturer	Scale
1.							:
2.							:
3.							:
4.							:
5.							:
6.							:
7.							:
8.							:
9.							:

Classification	Category	Power	Method	Hull Technique
Battleship, IOWA Class	10 Commercial	05 Free Sail	05 Bashed	05 Fiberglass
Cruiser, Atlanta Class	20 Military	50 R/C Elec	10 Bottled	30 Metal
TUG	40 Period	52 R/C Gas	30 Kit	40 Paper
Trawler	50 Pleasure	54 R/C Sail	40 Modified	50 POF/POB
Liner	60 Power	56 R/C Steam	60 Restored	60 Plastic
Bark		70 Rubber Band	70 Scratch	70 Solid/Lift
Side Wheeler		80 Static		

Special Talents or Skills:

Your R/C Channel(s)

Channel # ___ ___.___ MHZ Channel # ___ ___.___ MHZ

Channel # ___ ___.___ MHZ Channel # ___ ___.___ MHZ

Channel # ___ ___.___ MHZ Channel # ___ ___.___ MHZ

Electric Boat Props, Shafts, Couplings

GRAUPNER PLASTIC BOAT PROPS

2 Blade Props for Pegasus, Sea Commander

GR1124 **2 Bl Prop, Right (451/2)** **$2.30**
GR1125 **2 Bl Prop, Left (451/2A)** **$2.30**

2 Blade Prop for GR1039 Multispeed 380

GR1126 **2 Blade Prop, (455/13)** **$2.60**

2 Blade Prop for GR1014 Multispeed 7022

GR1127 **2 Blade Prop, (455/2)** **$2.60**

2 Blade Prop for GR1781 Hydrospeed 7022

GR1128 **2 Blade Prop, Right (1224/45)** **$2.70**
GR1129 **2 Blade Prop, Left (1224/45L)** **$2.70**

2-Blade Props for "MONSTER" Drive (GR1701)

(pitches are 1.2 times diameter)

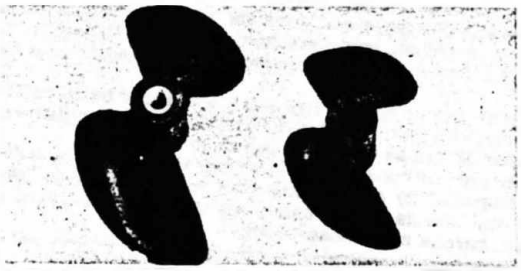
GR1145 **2-Blade Prop, 1.87" (2314/47.5)** **$3.70**
GR1146 **2-Blade Prop, 2" (2314/50)** **$3.70**
GR1147 **2-Blade Prop, 2.07" (2314/52.5)** **$3.80**

Rotations viewed from aft end of prop.
(R — Counter clockwise) — (L — Clockwise)

3 and 4 BLADE PROPS (with M4 Threads)

GR1131 **3 Blade Boat Prop 30mmR** **$2.40**
GR1132 **3 Blade Boat Prop 30mmL** **$2.40**
GR1133 **3 Blade Boat Prop 35mmR** **$2.60**
GR1134 **3 Blade Boat Prop 35mmL** **$2.60**
GR1135 **3 Blade Boat Prop 40mmR** **$2.70**
GR1136 **3 Blade Boat Prop 40mmL** **$2.70**
GR1137 **3 Blade Boat Prop 50mmR** **$3.00**
GR1138 **3 Blade Boat Prop 50mmL** **$3.00**
GR1139 **3 Blade Boat Prop 60mmR** **$3.40**
GR1141 **4 Blade Boat Prop 45mmR** **$2.80**
GR1142 **4 Blade Boat Prop 50mmR** **$2.90**
GR1143 **4 Blade Boat Prop 60mmR** **$3.00**

NEW! *"X-BRAND" props for electric Race Boats!*



On left is M4 prop, on right is Drive Dog Prop.

Very rigid black fiberglass-filled high pitch nylon props made only for racing boats. There are two types: props to fit the 4mm Graupner shafts (as on GR1781 and GR1701), and props to fit 3/16" "drive dog" shafts (as used by Octura and others).

M4 props, diameter:			**3/16" Drive Dog props, diameter:**		
RA3007	35mm	$1.15	RA3001	35mm	$1.15
RA3008	40mm	$1.25	RA3002	40mm	$1.25
RA3009	45mm	$1.30	RA3003	45mm	$1.30
RA3010	50mm	$1.40	RA3004	50mm	$1.40
RA3011	52.5mm	$1.50	RA3005	52.5mm	$1.50
RA3012	55mm	$1.60	RA3006	55mm	$1.60

Our Turnbuckles are 1/5 the price of their competitors!

GR5711 HL/Graupner **5/8" Turnbuckles, 10** **$13.20**
GR5712 HL/Graupner **1" Turnbuckles, 10** **$13.20**

Ten brass turnbuckles in a package. For adjustment and tensioning of flying wires and rigging on RC models of vintage aircraft. These are made of brass and have center holes drilled for safety lockwires. (See also our listing for Rigging Cable and Connectors beginning with stock #BER400).

HOBBY LOBBY INTERNATIONAL, INC.©
5614 FRANKLIN PIKE CIRCLE
BRENTWOOD, TN 37027 — (615) 373-1444
CATALOG NO. 11 — $1.00

Industrial Servo

NEW! *Powerful proportional servo for industrial use.*

HLSI1562 **Industrial Power Servo $175.00**

3¼" long and over half pound weight, this huge servo exerts 33 pounds of force at the output arm and responds to within 1/2° of the signalled position. It requires its own 4.8 to 7.2 volt nicad battery power supply because of the huge current draw (1700 ma) at full exertion. The gear system is all metal (mostly brass), using heavy duty sintered oil-impregnated bearings. The servo may be used with any brand of radio system but will need the servo connector for that radio.

Power Servo 1562 Specifications:
(millimeters, cm., kilogram, and gram units)

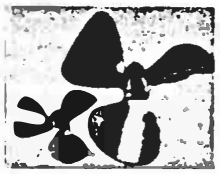
Lgt.oa	Ht.oa	Width	Weight	Full Transit time:	Torque	Throw
84.2mm	71.0mm	38.0mm	248gr	90°/0.3s	15.0pcm	90°

Hobby Lobby/Engel BRASS BOAT PROPELLERS

These are made of solid brass. The blades are stampings that are correctly concaved for maximum performance. You can file the edges for even higher performance. The hubs are threaded to fit our 3mm and 4mm shafts. Hubs are solid brass with trailing ends faired down to a point. Props come in "rights" and "lefts" for (respectively) counterclockwise or clockwise rotation (when looking at the aft end of the prop.)

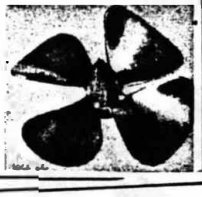
Brass 3-Blade Boat Props:

Stock Number	Diameter		Shaft Trd	Price
HLAE308	35mm (1.38")	R	M3	$3.65
HLAE309	35mm (1.38")	L	M3	$3.20
HLAE310	45mm (1.77")	R	M3	$5.00
HLAE311	45mm (1.77")	L	M3	$5.00
HLAE314	65mm (2.56")	R	M4	$7.80
HLAE315	65mm (2.56")	L	M4	$7.80



Brass 4-Blade Boat Props

Stock Number	Diameter		Shaft Trd	Price
HLAE316	35mm (1.38")	R	M3	$4.35
HLAE317	35mm (1.38")	L	M3	$4.35
HLAE318	45mm (1.77")	R	M3	$5.45
HLAE319	45mm (1.77")	L	M3	$5.45
HLAE320	55mm (2.17")	R	M4	$8.70
HLAE321	55mm (2.17")	L	M4	$8.70



This big, easy-to-build RC riverboat is actually propelled by the paddlewheel!

HLKK001C HL/Krick **Southern Belle RC Riverboat** .....

Southern Belle is (strangely enough) a German kit of a Mississippi riverboat! The kit builds easily into a 39" long, 11" wide, paddle wheel-driven RC river boat. The reason that the construction is so easy is that the hull and many of the odd-shaped fittings (lifeboat, "boilers", barrels on the deck) are made of preformed and heavy ABS. And the decks, bulkheads, pilot house, and exterior walls are all precut, easy-assembled rectangular plywood pieces. The running hardware is complete and consists of brass pulleys for the paddle wheel drive, collets, sprockets, belts and a very strong 6 volt Mabuchi Motor that has an integral five stage planetary gear reduction built on to it.

The 2 plan sheets are full size and the boat can be completed by only referring to the plans. The kit includes an English language instruction book that describes the construction completely.

Even though the construction is simple, the finished boat can be made truly beautiful by careful attention to painting such items as the horizontal boards on the cabin and using bright colors on paddle-wheels, barrels and smokestacks.

NEW! *Electric powered Hovercraft! You can use leftover 540-type motor and nicads from your RC car!*

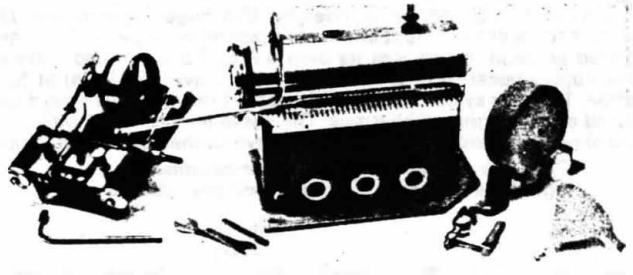
HLA501 Sun Lane **Electric Hovercraft** ....

19½" long overall, 9" high, about 3½ pounds when ready to "fly". The kit consists of several vacuformed lightweight styrene parts, a prop adapter for 1/8" shaft electric motors, and polyurethane and cloth readymade air skirt.

The Hovercraft is designed to accept any 540 diameter motor. The more powerful the motor the better the Hovercraft flies. With the standard Mabuchi 540 and a 7.2 volt nicad pack the Hovercraft will give good "flights" on smooth floors. With 8.4 volts and the same motor it will give good flights on slightly rough concrete driveways. The more power you use the better the performance. Even with the basic 540 and 7.2 volts, Electric Hovercraft can build up tremendous groundspeeds — be careful!

To complete the Hovercraft you will need a 540 type motor (GR1757), a 6-4 propeller, 2-channel radio (you can use a simple on-off switch for the motor control like HLA99001 or the easier to mount GR3965 or a speed control like HLTK001), a 7.2 or 8.4 volt 1200mah nicad pack (BAT303 or 304), styrene cement (the type used for display model car kits), and spray paints for finishing.

R/C Steam Powered Boat



A complete and inexpensive Steam Engine!
We have instructions for installation in Bugsier.

HLE202 **Two Cylinder Reversible Steam Engine** .....

This complete German steam engine is half the price of Japanese engines. It burns butane lighter fuel. It is self-starting, reversible and throttleable. The boiler is 5.5" long, 2.3" dia. The flywheel is 1.9" dia. The output shaft is 4mm and can be coupled to our Variable pitch prop shaft GR1777 and to most of the other prop shafts we list.

Made of nicely machined and chromed parts, it includes pressure tubing, relief valve, whistle, water sight glass, adjustable flame butane burner.

TELEDYNE RYAN AERONAUTICAL

ACHIEVER

SAN DIEGO, CALIFORNIA OCTOBER/NOVEMBER 1991

Rollout Is A Major Milestone For BQM-145A

Even the weather cooperated on September 20 to make it a glorious day for Teledyne Ryan Aeronautical with the rollout of the first flight vehicle in the BQM-145A (Model 350) program.

Storm clouds dumped buckets of rain on North County, but all was dry at the TRA plant until after the ceremony. Model 350 team members, who had worked long and hard to make this momentous milestone occur, added to the brightness with plenty of wide smiles.

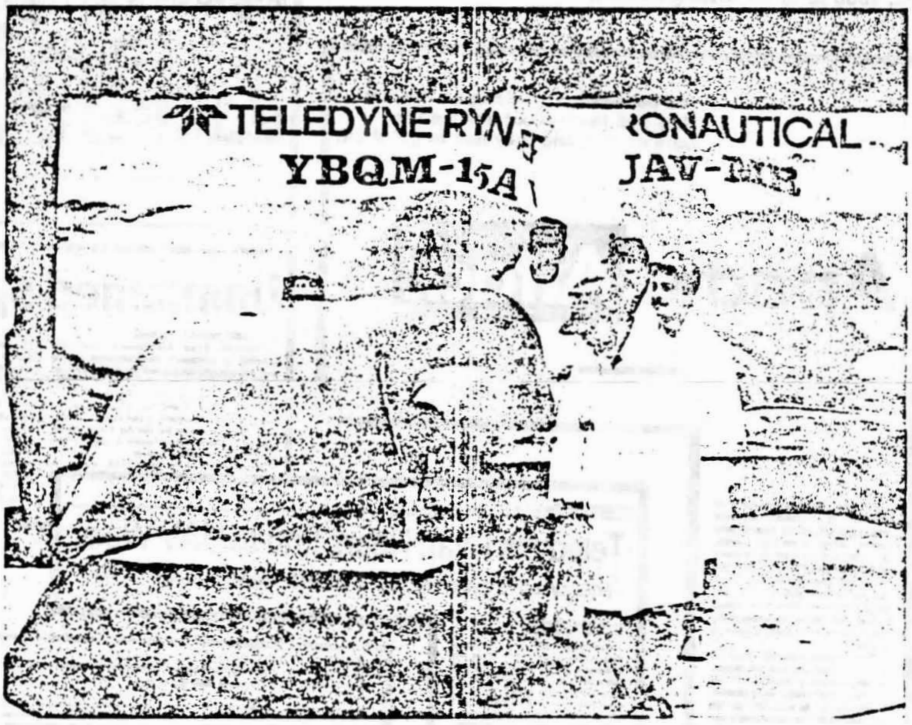
TRA President Bob Mitchell formally presented the first vehicle to Capt. John Olmstead, USN, the program manager for Navy UAVs. "I've got the keys right here – am I the first pilot?" asked Capt. Olmstead with a twinkle in his eye.

He added that all of the previous concerns about the program had been addressed and redressed and that the program was moving full speed ahead. "We have overcome a lot of obstacles, and have had great success with the program," he said.

Capt. Olmstead said the BQM-145A is "clearly vital to our government. We need this capability. Desert Storm/Desert Shield confirmed that. This is the solution."

Mitchell said "today is a major milestone in TRA's history of developing UAVs. The BQM-145A represents the highest level of technology ever achieved for an unmanned aerial vehicle."

Hudson Drake, President of Teledyne's Aerospace and Electronics Segment, made a trip from Los Angeles especially for the rollout. Drake is the former president of TRA and was very involved in the development and sale of the Model 350's predecessor, the Model 324 Scarab, now flying in Egypt.



Sleek-looking BQM-145A rolls through a painting of the vehicle in flight during the delivery ceremony Sept. 20. Providing on-ground propulsive power are (right to left) Butch Leonard, Ed Moss, Willie Flores and Rick Stewart.

Prestigious publications such as Aviation Week and Aerospace Daily sent reporters to cover the rollout, as did the San Diego newspapers and television stations.

Norm Sakamoto, TRA Vice President and Model 350 Program Manager, served as master of ceremonies for the event and watched proudly as his team members delivered the first vehicle after months of dedicated effort.

The vehicle rolled out Sept. 20 is undergoing a series of ground and component checks before moving to Utah to begin flight testing in early 1992. The initial flight tests will use F-4 aircraft as the launch platform. The operational vehicle will be released during flights from the F-16(R) and F/A-18 aircraft. It will also be ground launched with a booster assist rocket.

The current contract calls for production of 25 vehicles – two a combination of metal and composites and 23 more of aluminum. This contract, with a ceiling of $186.8 million, runs through 1996. After that, production plans from the Joint Project Office call for 525 vehicles – 260 for the Department of the Air Force and 265 for the Department of the Navy.

News Media Spotlight Shines On TRA

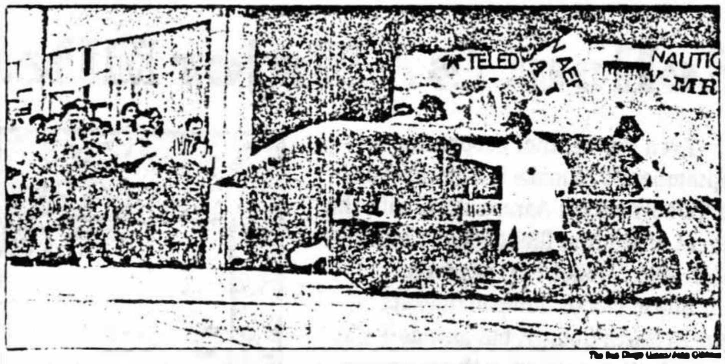
Teledyne Ryan Aeronautical made the news in a big way in recent weeks.

The Model 350 rollout, the $44 million contract extension for Firebee and Apache's standout performance in the Gulf War were the major stories. Publications like Aviation Week and Defense News highlighted the events, as did San Diego newspapers and television stations.

Some of the coverage is shown here. If you would like more complete details or a videotape of the TV reports, call Ext. 4365 to make arrangements.

The San Diego Union — Saturday, September 21, 1991 — C

Business



The San Diego Union/[illegible]

Teledyne Ryan crew rolls out the first of the company's new unmanned recon aircraft for viewing by workers and the press.

Unmanned spy aircraft unveiled

By ROBERT [illegible], Staff Writer

Teledyne Ryan Aeronautical yesterday unveiled an unmanned reconnaissance aircraft that defense officials say will be able to transmit [illegible] images [illegible] enemy territory to battlefield planners.

The craft that rolled out at the company's San Diego headquarters is the first of 25 test units being produced for the Air Force, Army, Marine Corps and Navy under a joint services contract worth $186.6 million.

Flight testing of the [illegible] 145A, as the 18- [illegible]

Capt. John Olmstead, Navy program manager, said the government wants to purchase 525 of the craft for the four Defense Department services at "just under $1 million apiece," [illegible]

"We don't have a firm price yet," said Olmstead, who added that the government would add another $1.5 million of [illegible] purchased separately for each aircraft.

The aircraft — also called an unmanned air vehicle, or "UAV" in aerospace jargon — has a top speed of close to the speed of sound, a range of 700 miles, can be launched from the ground or from a warplane and can be recovered on the ground or in midair by a helicopter.

The Navy and Marine Corps versions of the unmanned craft would be launched from an F/A-18 attack plane, while the Air Force version would be deployed from an F-16 fighter.

The craft has been the target of criticism from the Congress' General Accounting Office. Earlier this year, a GAO report questioned whether the craft could be jettisoned safely from an aircraft.

Since then, the UAV has been successfully launched from the F/A-18 and F-16 in wind tunnel testing, said Robert Mitchell, Ryan's president. "Every one of these tests was 100-percent successful and we had clean separa-

See UAV on Page C-2

The helicopters would open the war. They had to take out Iraq's early warning net, and they had to get it all.

Apache Attack

By [illegible]

At ten seconds before 2:38 a.m., in a [illegible] sky over Iraq, eight US AH-64 Apache helicopters zeroed in on their targets. On their forward-looking infrared screens appeared the images of two Iraqi radar sites just north of Saudi Arabia, placed there to detect intruding fighters. They were linked to four Iraqi fighter bases and to the Intelligence Operations Center in Baghdad.

The unseen Apaches hovered low, four miles south of the radars. At the controls of Number 976, 1st Lt. Tom Drew broke radio silence. "Party in ten," he said. On cue, ten seconds later, the helicopters unleashed a salvo of laser-guided Hellfire missiles. "This one's for you, Saddam," muttered CWO3 Dave Jones, the pilot of another Apache.

The shots, fired in the predawn hours of January 17, 1991, marked the start of Operation Desert Storm and were among the most crucial of the war, blinding Iraq's early warning net at a key moment. US Central Command relied entirely on the Apaches and USAF special operations helicopters to do the job. "It [illegible]

[illegible] — Air Force Magazine, October 1991

[illegible] Monday, October 21, 1991

Teledyne Ryan Nears End to UAV Woes

Pentagon Casts Eye on Metal Airframe for Medium-Range Drone

By [illegible]

SAN FRANCISCO — Teledyne Ryan Aeronautical [illegible] problems with the U.S. military's medium-range [illegible] aircraft that has [illegible] the [illegible] of the $2 billion program, defense and industry officials said.

At [illegible] the San Diego-based company [illegible] on a new metal airframe for the BQM-145A [illegible] unmanned aerial vehicle (UAV), [illegible] Teledyne Ryan Aeronautical [illegible] said [illegible] It will replace a [illegible] used in the original design.

Shortly after the [illegible] UAV [illegible] in June 1989, the Navy found that the airframe's [illegible] structure could rapidly deteriorate in saltwater and cause [illegible] of the composite skin on the [illegible] the aircraft.

AVIATION WEEK & SPACE TECHNOLOGY

[illegible]

The [illegible] of the Teledyne Ryan [illegible] at San Diego, Calif. [illegible]

The Mach 0.9 [illegible] UAV is designed to fly 700 naut. mi. [illegible] ground launch and return [illegible]

[illegible] the mission so data can be transmitted [illegible]

[illegible] the BQM-145A, the UAV [illegible] Advanced Reconnaissance System. ☐

THE SAN DIEGO UNION — Saturday, September 21, 1991

Contracts

Federal Contracts Report is a weekly summary of defense contracts recently awarded by the federal government to companies and other vendors throughout the Southern California area.

Teledyne Ryan Aeronautical in San Diego won a $44,087,772 contract from the Air Force to provide aerial target drones for the Air Force and Navy and various items of associated support equipment.

AVIATION WEEK & SPACE TECHNOLOGY/September 30, 1991

Tests Show Teledyne 350 Acceptable for Air Launch

Los Angeles

Captive carry and separation characteristics of the Teledyne Ryan Model 350 drone should be acceptable on the General Dynamics F-16 and McDonnell Douglas F/A-18 fighters, according to a series of wind tunnel tests conducted from February through August.

The Teledyne 350 is the medium-range element of the Defense Dept.'s unmanned aerial vehicle joint program office master plan, and is to be launched from the F-16 and F/A-18, as well as from the ground.

The drone is large, with a 10.5-ft. wingspan, 18-ft. length and 2,000-lb. weight, and there has been concern about the safety of carrying and launching it from these fighters. The F/A-18 is the only launch method currently specified by the Navy and Marine Corps.

F/A-18 captive carry loads were tested with a 12% scale model in McDonnell Aircraft's low-speed wind tunnel, while [illegible]

separation of the drone from the fighter was tested with a 6%-scale model in a Calspan high-speed wind tunnel. F-16 characteristics were studied using a similar pair of models. The Teledyne 350 is mounted on a [illegible] a small amount of negative lift at cruise conditions.

The Teledyne 350 program was restructured on June 10 to account for several items, which increased the cost of the fixed price contract from $77 million to $107 million:

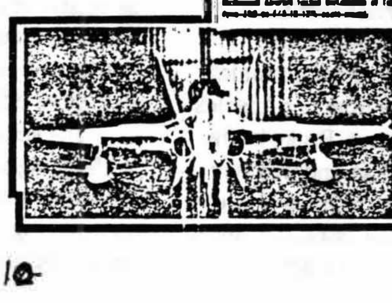
- Changing the airframe from composite materials to aluminum. The Navy was concerned that composite delamination would be difficult to detect, and that the aluminum honeycomb used as a composite core would be attacked by salt water corrosion. The Navy lands the drone in the ocean.
- Ensuring that advanced tactical air reconnaissance system (ATARS) sensors will fit in the Teledyne 350 as well as manned aircraft. This was considered low [illegible]
- Changing F/A-18 compatibility.
- Increasing the number of aircraft delivered under the contract from 15 to 25.

The program now has two phases:

- Check the drones' systems in two composite airframes while the new aluminum airframes are being built.
- Installing the systems in the aluminum airframes after they are proven in the first phase.

First flight of the composite airframe is set for February, 1992, air launched from a McDonnell Douglas F-4, and the metal airframe is expected to fly in 1993. ☐

[illegible]



SAN DIEGO TRIBUNE
Tuesday, October 1, 1991

BRIEFS:

Today's world business news

Contracts

Teledyne Ryan Aeronautical here will build 87 more Firebee aerial targets, worth more than $44 million, for the Air Force and the Navy under an extension of a contract. The Firebee is a small, jet-powered drone that is used for antiaircraft target practice. Constructed at Teledyne Ryan's Lindbergh Field plant, 53 of the pilotless aircraft will go to the Air Force and 34 to the Navy. Work on the additional Firebees will last through mid-1994.

Business Briefing

SAN DIEGO

Teledyne Ryan Aeronautical has received a $44 million contract to extend production of its Firebee target drone system. The order calls for 87 additional systems — 34 for the Navy and 53 for the Air Force — to be added to the current production of 112 Firebees, ensuring production into the middle of 1994.