EL TORBELLINO

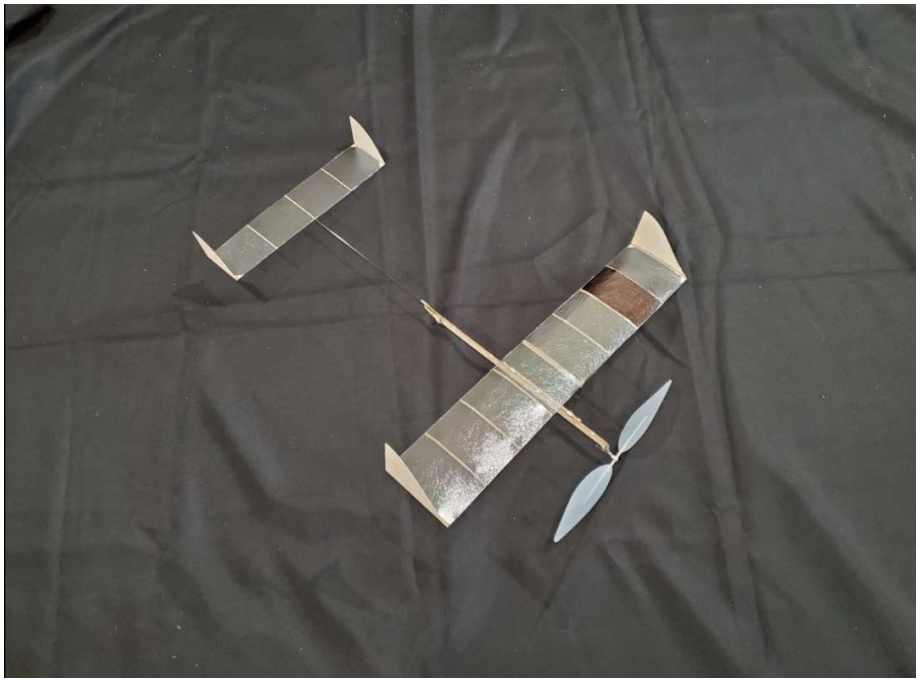
NEWSLETTER OF SAN DIEGO ORBITEERS FREE FLIGHT CLUB

OCTOBER 2021

Science Olympiad Wright Stuff Event for 2022
By Mike Jester

Since 1984 Science Olympiad has been an annual a nationwide competition where teams of middle school and high school students compete in a total of 23 testing and building events. Last year 5,000 teams participated at 375 live and remote tournaments. The Science Olympiad Wright Stuff (WS) event involves building a rubber powered indoor duration model airplane. Several world class fliers got their start by coaching the WS event such as 2016 F1D world champ Kang Lee. A number of student competitors in WS have risen to world class status including 2018 F1D world champ Brett Sanborn.

WS provides a valuable STEM experience for students. They actually build a device and experiment with it instead of racking up more screen time. The WS event has exposed tens of thousands of potential new entrants to the free flight hobby. Usually, the WS event has reasonable rules in terms of the maximum dimensions of the flying surfaces, the minimum weight of the model and the maximum weight of the rubber motor. However, in 2020 the rules for the WS event took a horrible turn for the worse. They mandated a ridiculously small prop (8 cm in diameter) and a small stab, which lead to serious instability issues. Fortunately, sanity has returned to the rules for 2022 high school (Division C) WS event. They set forth reasonable dimensional limitations for the wing, horizontal stabilizer (stab), and propeller (prop). The diameter of the propeller cannot exceed 24 cm. The wing cannot exceed 45 cm x 9 cm. The stab cannot exceed 28 cm x 7 cm. The minimum weight for the airplane is 8 grams (excluding the rubber motor) and the maximum weight for the rubber motor is 1.5 grams. With such rules the models will be stable and relatively easy to trim.



2022 WS Airplane Built from J & H Aerospace Kit

Continued Next Page

Under the 2022 WS rules, the models are very similar to P-18 models, except that the props of the former can be much larger. Most 2022 WS models will probably be flown with the 24 cm Ikara prop. It has a combined injection molded plastic hub and spars, and plastic film blades. The 24-cm Ikara prop weighs a little over two grams, so it is much larger and lighter than the 6-inch diameter injection molded plastic prop of a P-18 model. Two vendors are already supplying kits for building 2022 WS airplanes. They are J & H Aerospace and Guru Engineering. Perennial WS kit supplier Freedom Flight Models will almost certainly be offering a 2022 WS kit. Models meeting the 2022 WS rules can readily be built from scratch and one plan is already available on the HPA plans gallery. Produce bag from grocery stores can be used to cover the wing, stab and fin(s).

Reasonably diligent students with no free flight experience should easily be able to obtain 60+ second flights with their 2022 WS models. Those who apply themselves and do some research on the HPA and SciOly websites should be able to obtain 120+ second flights. It is possible for a well-built, well-trimmed, and optimally powered 2022 WS model to approach or even exceed 180 seconds of flight time in a typical high school gym. Students will have to commit to many hours of test flying and seek hands-on advice from accomplished indoor fliers in order to achieve this type of performance. They will have to learn to achieve optimum trim, wind to maximum, and de-wind to an optimum launch torque using a torque meter. They will also need to strip rubber to an optimum size in terms of grams per inch.

Hopefully we will soon re-gain access to the gym at Grossmont and have the opportunity to give hands-on advice to students who decide to compete in WS this season. In the early 2000s, John Hutchison mentored my younger son and my daughter in the Wright Stuff event, and they were both gold medalists in the San Diego Regional and Southern California WS competitions. Over the years Don Bartick has coached a number of students in WS and they have performed very well in competition.

Let's continue the Orbiteer's tradition of actively mentoring students in the WS event. The administration of Grossmont Junior College would see this as justification for our use of its main gym as a flying site. Students that we mentor and/or their parent coaches may be enamored of free flight and become active participants in our hobby after their days of competing in WS are over.

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Chairman's Corner - Mark Chomyn

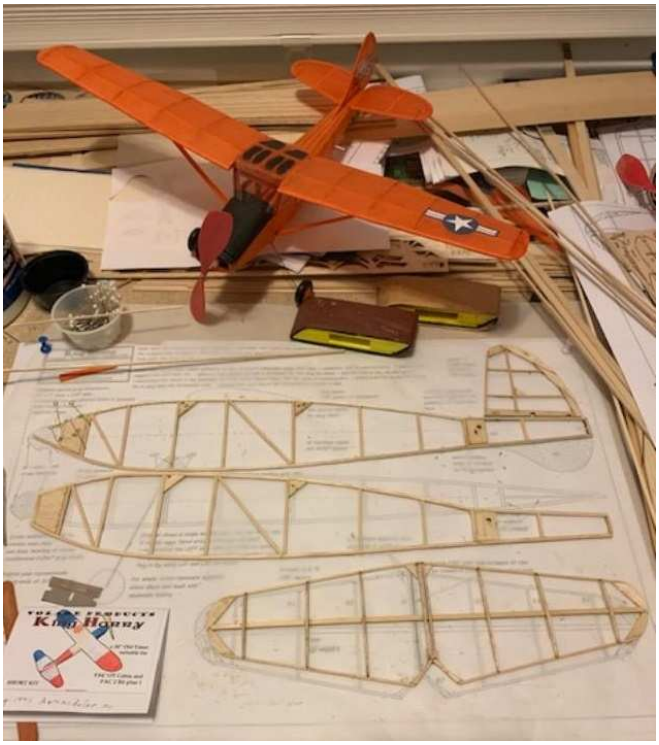
Current column delayed and will return next month.

From the Workbench – John Merrill

My latest project is an old-timer called the King Harry. It was first published in the August 1945 Aeromodeller magazine. I'm building it from a short kit obtained from Volare Products. It is a 24" wingspan plane that is suitable for our old-time/nostalgia contests, as well as FAC O.T. Cabin or FAC 2bit + 1 contest events.

Visible above that is my bright orange L-19 Bird-Dog, built from a Dumas kit. I played around with it a little towards the end of the last Orbiteers contest, and found that it didn't fly very well, but did nose-dive with great enthusiasm. I guess I over built the nose a little, although it seems to balance at the CG indicated on the plans. It'll look great hanging up in my garage.

So, what's on your workbench?



ORBITEERS MEMBERSHIP DUES

Annual Membership - $20
Lifetime Membership - $250
Non-Member Newsletter Subscription - $15
Junior Members 16 years old or younger - Free

Submit Dues to Club Treasurer:
Howard Haupt
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San Diego, CA 92117-4622

THE FINE PRINT THE FINE PRINT

El Torbellino is the official newsletter of the San Diego Orbiteers, an Academy of Model Aeronautics (AMA) Charter Club (#1113) and a California not for Profit Corporation. This newsletter is sent monthly to all paid members, selected exchange and magazine editors. Non-Members may subscribe at $15.00 per year within the U.S.A., offshore price will be adjusted to reflect the postage required. Materials from El Torbellino may be reproduced on an unlimited basis by other publications, but proper credit is requested.

ORBITEER WEB SITE

www.SanDiegoOrbiteers.com

Webmaster: Kathy McLaughlin

DUAL-CLUBS
FREE FLIGHT BONANZA

A National Cup Points Event

SAN DIEGO ORBITEERS 62nd ANNUAL - CLASS AA, CATEGORY 2
SPONSOR OF AMA & FAI EVENTS

*

FRESNO GAS MODEL CLUB 81st ANNUAL – CLASS AA, CATEGORY 2
SPONSOR OF NOSTALGIA, TEXACO & OLD TIME EVENTS

* November 13th & 14th, 2021 *
* LOST HILLS, CA *

SATURDAY ONLY *7 AM – NOON, 1 - 5 PM* ***LUNCH BREAK W/ ICE CREAM SOCIAL***	***EITHER DAY*** ***MUST FINISH EVENT THE SAME DAY***		***SUNDAY ONLY*** *7 AM – 3 PM*
A GAS	SMALL OT RUBBER STICK	.020 REPLICA	1/2A GAS(1)
C/D GAS	SMALL OT RUBBER CABIN	A PYLON	B GAS
E-36	LARGE OT RUBBER STICK	B-C PYLON	A/B ELECTRIC (COMB)
P-30 (1)	LARGE OT RUBBER CABIN	A FUSELAGE	HAND LAUNCH GLIDER (1)
VINTAGE FAI POWER	¼ A NOSTALGIA	B-C FUSELAGE	VINTAGE WAKEFIELD
CATAPULT GLIDER (1)	½ A NOSTALGIA	RUB/WAKEFIELD NOS	FULL SIZE TEXACO
½ A TEXACO	A NOSTALGIA	CLASSIC TOWLINE	MULVIHILL
DAWN P-30 MASS LAUNCH	B NOSTALGIA	½ A CLASSIC POWER	DAWN MULVIHILL
NIGHT GAS (COMBINED)	C NOSTALGIA	½ A GOLDEN AGE	GOLLYWOCK MASS LAUNCH
TWIN PUSHER MASS LAUNCH	EARLY ½ A NOSTALGIA	E NOSTALGIA 1/2A/A (COMB)	

(1) Junior & Senior/Open Event ***See Special Instructions on backside***

***** AN ORBITEER TRADITION LIVES ON *****

JOIN US FOR SATURDAY ICE CREAM SUNDAE SOCIAL ON US (NOON – 1 PM)
also

SATURDAY NIGHT FOOD FEST POTLUCK ORGANIZED BY DAN HEINRICH (6:00 -7:00 PM) *(Main course provided)(Bring a side dish or dessert)(Let Dan know what you're bringing at* aeronutd@cs.com *)*

CASH AWARD FOR 1st PLACE with 3 or more entries. PLACARDS awarded to 1st,2nd & 3rd place

Ceremonies at: 3:15 PM Sunday

$20 REGISTRATION Sr. & Open / $2 Jr

$5 per Event Sr. & Open / $1 Junior -
Optional: $40 for Registration & Unlimited Events

For Information Contact:

CD: Don Bartick, - San Diego Orbiteers
(858)774-2941
dbartick@4-warddesign.com

Nos,OT,: Doss Porter, Fresno GMC
559-251-0787
Steve93612@comcast.net

SPECIAL INSTRUCTIONS

(LOST HILLS FF MODEL AIRFIELDASSOCIATION CARD REQUIRED ($25 AT FIELD TO JOIN)

SATURDAY NOON to 1 PM LUNCH BREAK & SUNDAE SOCIAL

The contest will be suspended for 1 hour for lunch and the San Diego Orbiteers famous ice cream social. This is a great time to relax, cool off, have lunch and enjoy the ice cream sundaes. We will provide ice cream, & sundae fixings, napkins, plates and plastic ware.

PRIZE DRAWING

The Fresno GMC once again has collected an enormous amount of model stuff for their drawing. For up to 3 events entered that are sponsored by them, the contestant will receive a drawing ticket. Drawing to be held right after Sunday's award ceremony.

BILL BOOTH, SR. MEMORIAL

High time in Old Time Gas. Includes 020 Replica, but not Texaco. Winner will receive a special award from the Fresno GMC.

HAND LAUNCH GLIDER & CATAPULT GLIDER

Hand Launch Glider & Catapult Glider will to be launched from an established glider pen on the field. Max's are 120 seconds and all flights count.

NIGHT GAS FLYING

All engine classes combined. Event window between 6:30 pm – 9pm. Engine runs in accordance with aircraft classification; i.e., AMA or Nostalgia.

VINTAGE FAI POWER

For rules, please go to this website: ***https:// freeflight.org/wp-content/uploads/2020/12/NFFS-Competition-Rules-2021-2022-Release-3.pdf*** A copy of the rules will be available at the CD's table. *First five (5) flights must be flown from the established line between 7:00AM – 12:00 PM.*

VINTAGE WAKEFIELD

For rules, please go to this website: https:// freeflight.org/wp-content/uploads/2020/12/NFFS-Competition-Rules-2021-2022-Release-3.pdf A copy of the rules will be available at the CD's table. *First five (5) flights must be flown from the established line between 7:00AM – 12:00 PM.*

DAWN P-30

Saturday morning 7:30 AM sharp. Mass launch from glider pen; 1 flight, no max.

DAWN MULVIHILL (Timer can ride with contestant)

Sunday morning 7:30 – 7:50 AM launch window, 1 flight, no max.

TWIN PUSHER MASS LAUNCH

Saturday morning 8:30 sharp. Mass launch from glider pen; 1 flight, no max.

GOLLYWOCK MASS LAUNCH

Sunday morning at 8:00 sharp. Mass launch from glider pen; 1 flight, no max.

TEXACO (Timer can ride with contestant)

1/2A Texaco: Saturday 7:00-10:00 AM launch window, 8cc fuel; Full Size Texaco: Sunday 7:00-10:00 AM launch window, ¼ oz per pound – max 1.75 oz fuel.

1/2A GOLDEN AGE

Open to any free flight design that had plans published or dated from 01/01/1957 thru 12/31/1969. Engines are restricted to Holland Hornet .049/.051 and Cox T.D..049/.051. An electric version is included in the provisional rules and flown in a combined event. For rules, please go to this website: https:// freeflight.org/wp-content/uploads/2020/12/NFFS-Competition-Rules-2021-2022-Release-3.pdf A copy of the rules will be available at the CD's table.

San Diego Orbiteers
Flying Schedule 2021
Taibi Field Perris, Ca

Primary Date	Rain Date	Event
January 24 XXX	January 31 XXX	P30/Guilder/Power
February 21 XXX	February 28 XXX	Coupe/Glider/Power
March 21	March 28	OT-NOS Rubber/Glider/Power
April 18 XXX	April 25 XXX	P30 Oldenkamp Memorial
May 23	May 30	Coupe/Glider/Power
June 13	June 27	OT-NOS Rubber/Glider/Power
July	Perris Sunday Flyers	
August 15	Perris Sunday Flyers	
September 4-5	Scale Staffel	Perris
September 17-19	FF Champs	Lost Hills
September 26	SDO Monthly	P30/Glider/Power
October 17	October 24	Coupe/Glider/Power
October 21-24	WestFAC	Buckeye, AZ.
November 13-16	Dual Clubs	Lost Hills
November 21	November 28	OT-NOS Rubber/Glider/Power
December 19	December 26	Make-Up

XXX= Canceled Contest

Mark Your Calendars for the

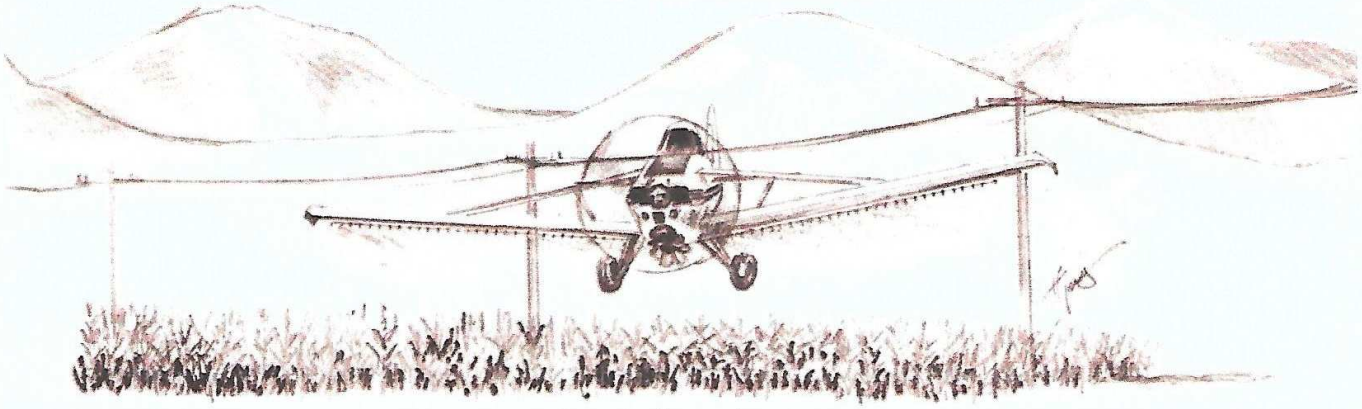
FLYING ACES

WestFAC 2021

21 – 24 October

Rovey Field, Buckeye Arizona

Featuring Working Aircraft of the World



Schedule of Events

Thursday, 21 October	Friday, 22 October	Saturday, 23 October	Sunday, 24 October
Arrival Day	**Mass Launch Events**	**Mass Launch Events**	**Mass Launch Events**
Registration and FAC	9:00 WW1	9:00 Double Trouble	9:00 Working Aircraft
Scale Judging	11:00 Greve/Thompson	11:00 WW2	11:00 Flying Horde NBM
Field Available for	**TOTF Scale Events**	**TOTF Scale Events**	**TOTF Scale Events**
Trimming	Crop Dusters	Working Aircraft	Mail Aircraft
	Dime Scale	Simplified Scale	Golden Age Monoplane/Biplane
	Carrier Acft – Hand Launch	Carrier Acft – Deck Launch	
	TOTF non-scale	**TOTF non-scale**	**TOTF non-scale**
	OT Rubber Stick	OT Rubber Fuselage (ROG)	2Bit + 1 (ROG)
	Jimmy Allen (ROG)	Embryo (ROG)	2Bit + 1 (ROG) NBM
	Jimmy Allen (ROG) NBM	Embryo (ROG) NBM	
	Judged Scale	**Judged Scale**	**Judged Scale**
	FAC Peanut Scale	FAC Jet Cat Scale	FAC Power Scale
	FAC Jumbo	FAC Rubber Scale	
			Special Event 3:00pm
			Blue Ridge Special Mass Launches

Awards ceremony Sunday on the field following the Blue Ridge Special event
Informal Dinner at the Arriba Mexican Grill – self pay

- See Field Notes on WESTFAC website as to the definition of a "working aircraft". Bring documentation to answer any questions for any unique aircraft.
- PPLC compliance checks and Dime Scale/Simplified Scale judging will be done on the field.
- Awards will be presented on the field at the end of flying on Sunday. Kanones will be awarded for first place.
- Carrier events - any naval aircraft with a tailhhook is eligible.
- Mass Launches may have an unlimited motor size but we will use the Delayed Launch in which the prop is released 3-4 seconds before the aircraft are launched.
- Go to the website (www.westernfac.com) to print out registration forms and download important field notes.
- Current AMA License is required.

$30 Entry Fee covers all events and all days

By Frank Morring, Jr.

Frank Morring, Jr. is Senior Space Editor
Join the conversation at:
AviationWeek.com/InOrbit
morring@aviationweek.com

COMMENTARY

Collision Course

'Mega-constellations' risk new explosion of space debris

In January 2007, China's military created the largest cloud of new space debris in history with the successful test of an anti-satellite weapon against an orbiting weather satellite. Two years later, the inadvertent collision of a defunct Russian military communications satellite and an operational Iridium commercial satcom bird added still another large orbital mess (see illustration).

AGI

In the 59 years since Sputnik I kicked off the space age, Earth orbit has become a dangerous junkyard of hypervelocity scraps that threaten to become an impenetrable barrier to human expansion into the Solar System. At the recent International Astronautical Congress (IAC) in Guadalajara, Mexico, NASA's top space debris expert reported that the U.S. Joint Space Operations Center (JSpOC) is tracking about 23,000 orbiting objects down to 10 cm in diameter, the smallest the military unit can spot with its radars and optical sensors.

The problem is likely to worsen rapidly as spacecraft become smaller and more are launched into the "mega-constellations" now in development, according to experts reporting on the issue at an IAC plenary session Sept. 27.

Jer-Chyi Liou of Johnson Space Center estimates there are another 500,000 objects in orbit between 10 and 1 cm dia.—the size of a marble—and more than 1 million more down to the size of a grain of salt—about 1 mm across. Moving at least 7.8 m/sec. (25.6 ft./sec.) to remain in free fall around the Earth, even the tiniest bit of material is capable of damaging or destroying anything in its path. On Aug. 23, Europe's Copernicus Sentinel-1A satellite took a debris hit on one of its solar arrays that left a 40-cm ding in its surface, disrupted the spacecraft's attitude and orbit, and lowered the power output from the array.

Holger Krag, Liou's counterpart at the European Space Agency (ESA) as head of its Space Debris Office, says, "the impactor was man-made and had a mass of 0.2 grams with a size of roughly 1 cm. That was too small to be contained in the catalog of objects JSpOc is tracking.

The task of alerting spacecraft operators of impending "conjunctions" is starting to overwhelm the U.S. military, which provides the warnings to reduce the danger to its own spacecraft from debris "cascades" that begin with a collision and lead to more impacts from the resulting debris.

Private satellite operators have set up an international Space Data Center to share position information on their active spacecraft to avoid conjunctions, but tracking and orbit prediction remain imprecise even when objects can report their positions with the help of GPS.

Spacecraft operators and launch service providers follow debris-mitigation protocols designed to prevent collisions and other events that produce fragments, including selecting orbits that decay rapidly or sending aging spacecraft into graveyard orbits and depressurizing tanks and other hardware to prevent explosions.

"Probably the most reliable part of our system is our deorbit side, because you've got to get them down and then they burn up," says Greg Wyler, chairman of OneWeb, a U.S. startup that is developing a constellation of 400 satellites in low Earth orbit (LEO) designed to provide internet connectivity to schools in developing nations and rural users.

OneWeb spacecraft will weigh 150 kg (330 lb.), and maintain their positions in the constellation automatically, according to Wyler. Planet, an Earth-observation startup that already has launched more than 100 of its tiny "Dove" Earth-observation satellites, is aiming for a global constellation of 140 spacecraft able to provide daily updates of the entire surface.

Comparable to a 3U CubeSat measuring 10 X 10 X 30 cm, the tiny Dove satellites decay and reenter quickly, both to minimize debris and allow for rapid technology upgrades. Both mega-constellations have lofty social objectives for their systems. Wyler says his goal is to connect every school in the world to the internet using inexpensive ground terminals so simple they "can be installed by a high school girl, with no training."

Front-page newspaper images from Planet have spurred the Peruvian government to move against illegal gold mining in conservation areas. The encroachments were clearly observable because of the change in vegetation as the miners cut trees. That is typical of the benefits daily monitoring can bring, according to Robbie Schingler, Planet co-founder and chief strategy officer.

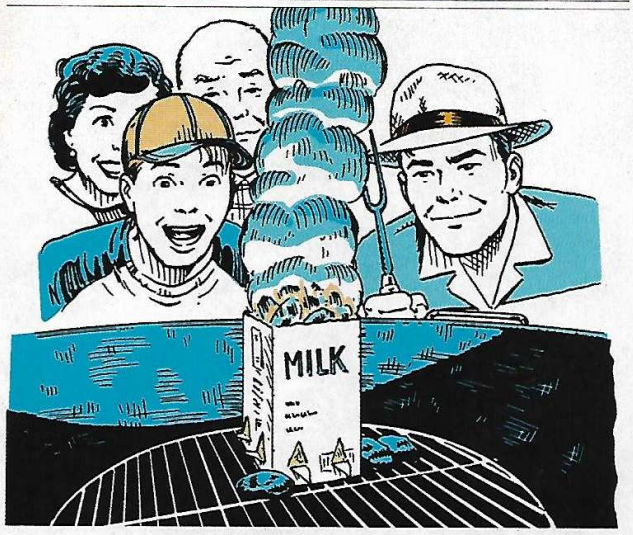
But even with 100% effective mitigation on the new constellations, the statistical analyses presented at the IAC suggest some increase in space debris is inevitable.

Krag says the combined total of 1,000 more satellites at 1,100 km (684 mi.) altitude would create a "totally insane" situation in the next 50 years if mitigation drops significantly below current levels—40,000 more large objects by 2100.

Shop Notes

EASY WAYS TO DO HARD THINGS

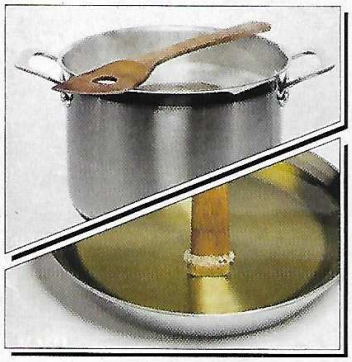
INDEX



Food Cartons Used to Ignite Barbecue

TO QUICKLY HEAT CHARCOAL for a small camp grill, improvise a chimney from a paperboard milk carton: Dry it out, cut off the top, and cut ventilation holes around the bottom. Stuff in paper scraps, then pour self-starting charcoal on top. Light the paper. For an easy-to-pack fire starter for picnics, fill the egg cups of a cardboard egg carton with charcoal. When ready to grill, put lighter fluid on the carton and light it.

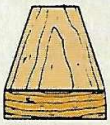
Wooden Spoon Solves Kitchen Quandaries



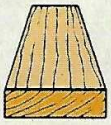
Without a thermometer, how can you know when fry oil has reached the required temperature? Inserting the handle of a wooden spoon into the heated oil provides an indication: Slow-rising bubbles around the handle mean the oil is ready. When making pasta, a busy chef's pot often boils over. A wooden spoon balanced on the mouth of the pan retards the rising bubbles.

GUIDE TO WOOD GRAIN

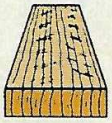
The wide surface of a board and the growth rings of the tree it was cut from create an angle that is used to classify it.



FLAT-SAWN
Zero to 30 degrees. Cathedral face grain.



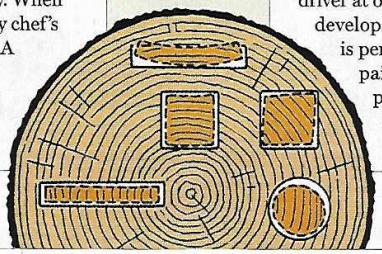
RIFT-SAWN
Thirty to 60 degrees. Straight face grain.

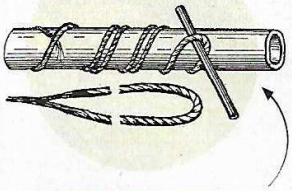


QUARTER-SAWN
Sixty to 90 degrees. Straight grain with fleckling on face.

As wood dries, it shrinks in two dimensions: tangent to the growth rings and along their radius. Tangential shrinkage is more severe, so a board cut tangent to the rings is less stable. Here's how common cuts will shrink.

fresh cut
shrinking





FROM THE ARCHIVES (1908!)

Ingenious Improvised Pipe Wrench

Improvise a pipe wrench with a length of rope and a metal bar, like a crowbar: When a pipe needs to be tightened, fold a rope in half and tie the ends together. Wrap the rope tightly around the pipe, tucking the tied end under one of the windings to hold it in place. Thread the metal bar through the loop at the other end of the rope. Twist the bar and the rope tightens and twists the pipe.

Copper Wire Helps Wood Screw Grab in Stripped Hole

Remove the sheathing from a length of stranded copper wire. Insert the wire into the stripped hole and cut off the excess. Now insert the screw and begin driving it. It grabs, thanks to the wire.

Paint-Can Key Removes Excess Paint in Hard-to-Reach Areas

A standard paint-can key is not only more effective than a screwdriver at opening paint cans but it develops a burr on its end that is perfect for scraping excess paint from hard-to-reach places, like around the edges of a doorknob plate or escutcheon.

ILLUSTRATIONS BY TED SLAMPYAK

SAN DIEGO ORBITEERS
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WHAT'S HAPPENING - OCTOBER / NOVEMBER 2021

October 17	San Diego Orbiteer Outdoor Monthly Taibi Flying Field, Perris CA, 8:00 am. Events: Coupe, Glider, Power
October 21-24	FLYING ACES WestFac 2021 Rovey Field, Buckeye AZ See enclosed flyer for scheduled events
November 13-14	DUAL-CLUBS FREE FLIGHT BONANZA San Diego Orbiteers 62ND Annual – Class AA, Category 2 Lost Hills, CA See enclosed flyer for scheduled events
November 21	San Diego Orbiteer Outdoor Monthly Taibi Flying Field, Perris CA, 8:00 am. Events: OT-NOS Rubber / Glider / Power