THE INVERTED FLYER
NEWS of the BOULDER AEROMODELING SOCIETY
AMA Charter # 906

March 2003 Edition

2003 Officers:

President:	Terry Edwards	(303) 499-6463	Secretary:	Russ Larsen	(303) 828-2872
Vice Presidents:	August Bruno	(303) 828-0910			
	Rich Anderson	(303) 652-2224	Newsletter Editor:	Boris Sergeev	(303) 530-2063
	Wendell Wickstrom	(303) 494-9324	e-mail:	BSergeev@excite.com	
Treasurer:	Ken Jochim	(303) 444-3206			

NOTICE: Club Meetings are held now on the **Second Wednesday** of each month

We nave now **RAFFLES** at the Club meetings!

Next Meeting: **March 12, 2003**
7:00 PM at Boulder TEC Center
6600 Arapahoe Ave., opposite the Valmont power plant

DON'T FORGET: Membership Dues were due before March 1st ($40 individual, $50 family, and $15 junior). People, who do not pay by the end of March, will stop receiving newsletters. The lock at the flying field gets changed in the first week of March.

REMINDER

The last person to leave the flying field needs to ensure that the gate to the field is locked. The gate must be locked with the club's padlock locked through the city's lock in order to allow the city to have access to the field.

Any maintenance work at the field must be coordinated and approved by club officers and Boulder City staff.
All maintenance work to be done at the field must first be coordinated with club vice president Rich Anderson (303) 652-2224. Rich will coordinate requested projects with club officers and Matt Claussen with the Boulder City Parks and Recreation Department, and if the project is approved dates will be established for the work to be done.

BAS MEETING MINUTES

February 13, 2002

President Terry Edwards called the meeting to order at 7: 05pm. The meeting was held at the TEC Center.

Special Program

President Terry Edwards introduced Earl Bolten who works with school kids on flight projects. Earl has been working with the schools for the past fourteen years.

Two of his students, Karen Van Dussen and Jennie Wright, talked about some of the projects that they have been involved in through Earl's program. Karen built a wind tunnel and Jennie had completed a research project on the SR-71 Airplane.

The students explained that they are involved in the construction of the "Rite Kite" which is a ½ scale airplane that they plan to display at the Centennial Celebration. After that event, the airplane will be displayed at the Lowrey Museum..

Minutes

The minutes were printed in the January Newsletter..

Treasurers Report

No report was given.

Old Business

There were no items to discuss.

New Business

Ken Jochim and Augie Bruno reported that they met with the CU students and there is a lot of interest in the junior member program.

Dave Recker, one of the CU students, talked about their program. He explained that the group's desire is to have students learn to fly before they get into the design phase. There was consensus of the members to get involved with the CU student program.

President's Items

At the officers meeting on 2/28/03, we discussed the agreement with the city. We will request some changes and go from there. 4 More flight benches will be constructed and installed in the next few weeks.

President Terry Edwards announced the following programs for upcoming months:

March 12, 2003
Demo of RealFlight R/C simulator and Jeppeson IFR simulator

April 9, 2003
Dave Janson presents a history of R/C engines with some engines on display

April 14, 2003
Nathan Lancaster from the Jeffco Club with a demo of a pure jet turbine engine

May 2003
Herb Kothe will bring some competition rubber models

June 28 & 29, 2003
EAA fly in at Longmont.

Terry added "I am looking for someone to give programs on Batteries and on Park Flyers".

Other Information

Glen Miller informed the members that Jacque Harvey, a BAS member passed away the week before the meeting. Members took time to reflect on the interest and dedication Jacque brought to the club. He will be missed as a friend and club member. Information to follow about a special memorial service.

Rudy Glick thanked Boris for a good job with the newsletter.

Ken Jochim reported that March 1, 2003 is the target date for using the new keys at the field.

Airplane show and tell and a raffle followed the meeting.

Meeting adjourned

Respectfully submitted,
Russell Larsen, Secretary

FLYING FIELD HOURS

9:00am to dusk on weekdays
10:00am to dusk on weekends

INSTRUCTORS LISTING

Call if you need help getting started:

Dean Chandler	(303) 652-2125
Steve Croft	(303) 651-9104
Tony Kilwein	(303) 438-8500
Wendell Wickstrom	(303) 494-9324

ON THE HORIZON

Next Club Meeting: *April 9th, 2003*
Boulder TEC center

CLASSIFIEDS

John Kolberg sells his English PAW ball-bearing .35 diesel engine for $75.

The full description of this engine can be found at the Club's Classifieds page: www.milehighwings.com/club/classifieds

Please e-mail your ads to the Editor: BSergeev@excite.com

THE YELLOW PAGES

A listing of area merchants whose products are of interest to R/C enthusiasts; provided as a service to our members. Some will give you a discount with your current club card.

Boulder Hobbies, 2125 32nd Street, Boulder (303-442-8669), Phil Battany

Mile High Wings sales@milehighwings.com The source of R/C Simulator interfaces: www.milehighwings.com/joystick.htm BAS members get 10% discount

Action Hobbies, 1477 Carr, Lakewood, (303-233-6275), Glen A. Magree

Hobby Town, 800 South Hover Rd. Longmont, (303-774-1557) Jim Koln

Don's Hobbies, 815 10th Street, Greeley (970-353-3115) Tony Farro

Things with Wings, 6268 W. 10th #2 Greeley (970-352-1067) Jim Richardson

Hobby Town, 6815 W. 88th Ave., Westminster, (303-431-0482), James Miley

Hobby Giant, 5545-A, Olde Wadsworth, Arvada, 303-940-9238, Larry Cencich.

Heliport Hobbies, 1400 W. 70th Street, Denver 303-430-8828, also Magnum Fuels

PICTURES FROM THE FIELD

Dean Chandler, Rudy Glick, and Wendel Wickstrom defy the weather and fly their float planes from the solid grounds:

The complete coverage of this endeavor can be found at the Club's Picture Gallery on the Web:
www.milehighwings.com/club/gallery

ARTICLE OF THE MONTH

Facts About Balsa

Model airplanes are no different from any other type of flying machine, large or small. The lighter it is built, the better it will fly! With that in mind, it is easy to understand why balsa wood has been the standard material for model airplane construction since it first became readily available in the US in the late 1920s. Its outstanding strength-to-weight ratio enables hobbyists to construct durable models that fly in totally realistic manner. Balsa also absorbs shock and vibration well and can be easily cut, shaped, and glued with simple hand tools.

Where does balsa wood come from? Balsa trees grow naturally in the humid rain forests of Central and South America. Its natural range extends south from Guatemala, through Central America, to the north and west coast of South America as far as Bolivia, however, the small country of Ecuador on the western

coast of South America is the primary source of model aircraft grade balsa in the world. Balsa needs a warm climate with plenty of rainfall and good drainage. For that reason, the best stands of balsa usually appear on the high ground between tropical rivers. Ecuador has the ideal geography and climate for growing balsa trees. The scientific name for balsa wood is *ochroma lagopus*. The word balsa itself is Spanish meaning raft, in reference to its excellent flotation qualities. In Ecuador it is known as Boya, meaning buoy.

How does balsa wood grow? There is no such thing as entire forests of balsa trees. They grow singularly or in very small, widely scattered groups in the jungle. For hundreds of years, balsa was actually considered a weed tree. They reproduce by growing hundreds of long seed pods, which eventually open up and, with the help of the wind, scatter thousands of new seeds over a large area of the jungle. Each seed is airborne on its own small wisp of down, similar to the way dandelion seeds spread. The seeds eventually fall to the ground and are covered by the litter of the jungle. There they lay and accumulate until one day there is an opening in the jungle canopy large enough for the sun's rays to strike the jungle floor and start the seeds growing. Wherever there is an opening, made either by a farmer or by another tree dying, balsa will spring up as thick as grass. A farmer is often hard put to keep his food plot clear of balsa. As the new balsa trees grow, the strongest will dominate and the weaker trees will die. By the time they mature, there may be only one or two balsa trees to an acre of jungle.

How long does it take a balsa tree to grow? Balsa trees grow very rapidly (like all pesky trees). Six months after germination, the tree is about 1 1/2 inches in diameter and 10 to 12 feet tall! In 6 to 10 years, the tree is ready for cutting, having reached a height of 60 to 90 feet tall and a diameter of 12 to 45 inches. If left to continue growing, the new wood grown on the outside layers becomes very hard and the tree begins to rot in the center. Unharvested, a balsa tree may grow to a diameter of six feet or more, but very little usable lumber can be obtained from a tree of this size.

The balsa leaf is similar in shape to a grape leaf, only a lot bigger. When the tree is young, these leaves measure as much as four feet across. They become progressively smaller as the tree grows older, until they are about 8 to 10 inches across. Balsa is one of the few trees in the jungle which has a simple leaf shape. This fact alone makes the balsa tree stand out in the jungle.

How are balsa trees harvested? While nature intended the balsa tree to be a shortlived nursemaid, humans eventually discovered that it was an extremely useful resource. The real start of the balsa business was during WW I, when the allies were in need of a plentiful substitute for cork.

The only drawback to using balsa was, and still is, the back-breaking work that is necessary to get it out of the jungle. Because of the way the individual balsa trees are scattered throughout the jungles, it has never been possible to use mass production logging procedures and equipment. The best way to log balsa trees is to go back to the methods of Paul Bunyan—chop them down with an axe, haul them to the nearest river by ox team, tie them together into rafts, and then float the raft of balsa logs down the river to the saw mill.

The logging team usually consists of two native Ecuadorians, each armed with a broad Spanish axe, a machete, and a long pole sharpened like a chisel on one end for removing the bark from the downed trees. Because of the hilly terrain, an ox team may only be able to drag two logs to the river per day. At the saw mill, the balsa is first rough cut into large boards, then carefully kiln dried, and finally packed into bales for shipment to the US via ocean freighter.

Why is balsa wood so light? The secret to balsa wood's lightness can only be seen with a microscope. The cells are big and very thinned walled, so that the ratio of solid matter to open space is as small as possible. Most woods have gobs of heavy, plastic-like cement, called lignin, holding the cells together. In balsa, lignin is at a minimum. Only about 40% of the volume of a piece of balsa is solid substance.

To give a balsa tree the strength it needs to stand in the jungle, nature pumps each balsa cell full of water until they become rigid—like a car tire full of air. Green balsa wood typically contains five times as much water by weight as it has actual wood substance, compared to most hardwoods which contain very little water in relation to wood substance. Green balsa wood must therefore be carefully kiln dried to remove most of the water before it can be sold. Kiln drying is a tedious two week process that carefully removes the excess water until the moisture content is only 6%.

How light is kiln-dried balsa wood? Finished balsa wood, often found in model airplane kits, varies widely in weight. Balsa is occasionally found weighing as little as four pounds per cubic foot. On the other hand, you can also find balsa which can weigh 24 pounds or more per cubic foot. However, the general run of commercial balsa for model airplanes will weigh between 6 to 18 pounds per cubic foot. 8- to 12-pound balsa is considered medium or average weight, and is the most plentiful. Six pounds or less is considered "contest grade", which is very rare and sometimes even impossible to obtain.

Is balsa the lightest wood in the world? No! Most people are surprised to hear that botanically, balsa wood is only about the third or fourth lightest wood in the world. However, all the woods which are lighter than balsa are terribly weak and unsuitable for any practical use.

The very lightest varieties don't really resemble wood at all, as we commonly think of it, but are more like a tree-like vegetable that grows in rings, similar in texture to an onion. It is not until balsa that there is any sign of real strength combined with lightness. In fact, balsa wood is often considered the strongest wood for its weight in the world. Pound for pound it is stronger in some respects than pine, hickory, or even oak.

Copied from *AMA National Newsletter*, which borrowed the material from RC Propwash
Ocala Flying Model Club
Dick Smith, editor

Mechanical properties of balsa, as well as tons of wood-related technical information, can be found in U.S. Department of Agriculture publication *Wood as an Engineering Material*, which is located on the Internet at
www.netexperts.cc/~lambertm/Wood/usdabook.html

Note to members receiving newsletter by snail mail:

If you send the editor your email address, we can send you the newsletter by e-mail. This saves the club 37 cents each newsletter PLUS you get all the links clickable and all the pictures in color rather than black and white. And you get it a couple of days sooner.

The Inverted Flyer is published monthly by the Boulder Aeromodeling Society as a service to its members. Submissions for publication are encouraged and can be but are not limited to: articles pertaining to Aeromodeling, letters to the editor, short news items of general interest to BAS members, and announcements. Space permitting, all submissions will be published except as follows: no anonymous letters or any submission containing morally objectionable content or language, as judged by the editor. Classified ads will be provided to the members of BAS free of charge. The deadline for all submissions and classified ads will be the first of the month for publication on or about the first Wednesday of the month. Opinions expressed in the Inverted Flyer are not necessarily those of the Boulder Aeromodeling Society general membership.

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