TOSSUP 97

Meeting Report for October

October's meeting was again held in Catlin's Restaurant. About a dozen people showed up and between the eating and drinking we discussed:-

- Whether to buy a winch and 2 turnarounds from Don for $310. This was put to a vote and approved.

- Whether we should hold a 'Nostalgia' type contest. (*Actually, most of the discussion was about what exactly the Nostalgia class was. There's a set of recent LSF Nostalgia rules on Page 3 for the readership to figure it out! Ed.)*

NOTE: The November meeting will be the AGM. Also, its getting to that time of year where both TOSS and the AMA will be expecting membership renewals.

Competition Report for November

The competition on 11/9 was held in conditions that contrasted sharply with the previous month. The sky was clear with increasing high cloud (preceeding the first rainstorm of the season), the temperature was perfect in the mid 70s and the wind light. Apparently a perfect day for soaring, especially as the previous day had lots of lift, enough to cause Charlie's Essence to practically vanish into a cloud at one point. Unfortunately the approaching storm seemed to have killed most lift, with what lift there was being in small bubbles which were barely sufficient to maintain launch altitude. Landing was also somewhat more difficult than it appeared because the wind was from the South East and tending to gust, which made landings erratic - several pilots had their landings ruined by sudden gusts which pushed their planes off line. This made an otherwise ordinary competition interesting.

The competiton had three rounds - 3, 6, and 8 minutes with landings counting 40 points towards a 1000 total.

Monthly Competition Results - November 1997

Name	Glider	R1			R2			R3			Total	Normal	Yearly
Mike Reagan	Addiction	3:02	49	968.9	5:59	89	992.9	8:00	70	988.0	2949.9	1000.0	995.9
Art McNamee	Addiction	3:01	84	988.3	5:38	74	930.9	7:59	96	996.4	2915.6	988.4	984.3
Bob Swet	Condor	3:00	71	988.4	5:58	84	988.3	7:48	0	936.0	2912.7	987.4	983.3
Edgar Weisman	Saphire	3:02	78	980.5	6:02	86	989.1	6:35	71	818.4	2788.0	945.1	941.2
Gary Filice	Mako	3:01	82	987.5	5:57	0	952.0	6:20	36	774.4	2713.9	920.0	916.2
Don Northern	Paragon	3:02	93	986.5	3:16	0	522.7	7:59	80	990.0	2499.2	847.2	843.7
David Butkovich	Super-V	3:04	44	956.3	2:52	81	491.1	7:53	87	980.8	2428.1	823.1	819.7
Don McNamee	Super-V	3:01	98	993.9	6:02	57	977.5	8:04	88	987.2	2958.5	1000.0	998.8
David Butkovich	Super-V	3:03	55	966.0	5:56	13	954.5	3:02	98	403.2	2323.7	785.4	784.5
Don McNamee	Spirit 100+	2:58	87	984.1	5:57	96	990.4	7:58	79	987.6	2962.1	1000.0	1000.0
Bob Swet	Oly 650	3:00	14	965.6	4:46	68	789.9	8:02	79	987.6	2743.1	926.1	926.1
Don Northern	Paragon	3:08	68	944.5	4:10	0	666.7	8:00	96	998.4	2609.6	881.0	881.0
Larry Jimenez	Paragon	3:15	62	904.8	6:05	89	982.3	4:40	91	596.4	2483.5	838.4	838.4

1995-1998 LSF NATIONALS NOSTALGIA SAILPLANE EVENT RULES

(Taken from a posting on RCSE discussing Nostalgia type events.)

Design Release Requirements: *"Date of Release:"*

The latest accepted magazine date for the published design, or the release of a kit will be 01JA80.
If the kit or published design had several release dates that included modifications to the design, only those prior to 01JA80 will be accepted.

Airframe Requirements: *"Items That Must Duplicate the Original:"*

The plane must replicate the original styling and appearance and comply with the vision of the Nostalgia event (Vision is stated under Special Items).

- Airfoil, flying surfaces plan forms, moments and surface areas...
- Fuselage form or styling in outline both in side and plan views
- Basic construction... ie. open bay wing structure, wood vs. FRP etc.

"Items That Can Deviate from the Original:"

Control surfaces... if desired, on a plane with no glide control capability, spoilers may be added to the upper wing surface as long as the plans do not call for any other glide control device. If the plans have a glide control system, it must be the one used and shall not be deviated from. If spoilers are added, they must be designed to minimize the affect on the styling of the original aircraft. (An example would be on an open structure wing, the spoiler system must be of minimal dimensions including the area around the spoiler bay used to attach the covering.)

Any interior, non-visible, structural modifications to enable the plane to handle modern launch equipment and techniques... some examples:

- Substitute spruce for balsa
- CF reinforcements
- Larger joiner rods
- Stronger tow hook systems
- Wing incidence and decalogue
- Wing mounting (bolt on vs. rubber bands)
- Removable or bolt on stabs rather than permanent stabs as long as theassembled position replicates the original and visible architecture is unchanged
- Dihedral (either tips or center or both) can be modified a maximum of 25% of the original for personal handling characteristics

"Special Items:"

Radios can be of any type legal to operate and electronic mixing is allowable on any set of surfaces. The use of landing arrestors devices is prohibited. This does not eliminate the use of a smooth surface skid to protect the bottom landing surface of the aircraft from scratches and nicks. The CD will have the final vote on legality for 1996 on any item not covered in this document... Bear in mind that the vision of the event is to duplicate the spirit of the old days in styling and form of aircraft and flying capability of said aircraft and only those changes consistent with launch and landing safety will be allowed. The final proof of legality of the design for this event lies with the contestant and having an original set of plans would be the optimum way to settle any questions.

TOSS Field Rules

(After all the discussions over the last few months about Field Rules I found an old copy from March 1994 and have reprinted them here "For Your Interest" - Ed.)

All Locations

1) No pilot shall fly any plane unless he/she has a current valid AMA membership and observes all applicable AMA Safety and Flight Regulations.
2) No pilot shall fly any plane alone unless he/she has proven confidence to fly without assistance.
3) All equipment should meet current specifications and should be in good working order *(Paraphrased from a bit about pre-1991 specs and Gold Stickers - Ed.)*
4) Pilots should obtain the proper frequency pin before operating a transmitter during "controlled operation" periods. During "uncontrolled operation" times the pilot is responsible for ensuring that he/she is the only operator of that frequency while his/her equipment is on.
5) Prior to launching, make sure that the launch area and launch equipment are clear of people and planes. Visually verify that conditions are safe and shout *"Launching!"* just prior to launch.
6) No launches during "controlled operations" should be made without the assistance of a "spotter" whose sole responsibility will be the public safety in regard to the operation of the equipment. This person should be the same as the retriever operator whenever possible.
7) No plane shall fly over the pit area below 50' or tree top in altitude.
8) Landing planes always have the right of way.
9) If anyone is in the landing area during landing approach shout *"Landing!"* to warn them.
10) Guest pilots should accompanied by a member at all times. Host member will be responsible for the guest's compliance with club rules.
11) Fields are to be used only for the purpose of flying non-powered R/C gliders.

Redwood School

1) We have field priority only on Sundays. At all other times we yield to other activities.
2) All garbage must be removed at the end of a flying session.
3) Use flight area discretion. In simple terms, don't fly low over houses or people. Beginners should fly only over the lower field.
4) You must posses a copy of the usage permit at all times.

Paramount Ranch

1) Obey all park rules and regulations.
2) Flying should be conducted from the north loop of the race track.
3) The flying area is available during regular visitor hours if the area is not already in use by other park approved groups.
4) Do not fly over spectators or low over the road.
5) You must leave the site in the same condition as you found it. This means that you must remove all garbage including rubber bands, cups, cans, balsa wood, covering &tc. You are responsible for separation and recycling of glass and aluminum containers.
6) You are responsible for the security of anything left overnight.
7) Do not remove, damage or destroy anything in the park without prior park approval.

A NOTE ON AIRTOWING.....

From: Mark Stucky <Mark.Stucky@dfrc.nasa.gov>
To: hang-gliding@lists.utah.edu

I will be piloting a delta wing vehicle on aerotow sometime in the next few weeks. The glider has a wingspan of 38 feet and a wing area of 661 sq. ft. It sounds like a real "floater" but has a 170 knot takeoff speed since it weighs 30,000 lbs.

Most people's visions of this project are WAY better than what it really is (at least at this stage). A company called Kelly Space and

Technology *(http://www.KellySpace.com)* has a patented space launch concept involving aerotowing a space shuttle-like vehicle behind a B-747. The concept is to use the 747 as the "booster" stage. You get the benefit of an air-breathing booster without the huge weight and expense of a dedicated conventional booster stage. There are a bunch of less obvious benefits from this arrangement such as ability to launch from anywhere (instead of having a dedicated launch complex), additional flexibility in trajectory, orbit, and launch windows are other potential benefits. The "Astroliner" would ingnite its rocket engine at the top of the tow, verify all systems A-OK, release the tow rope, throttle up the rocket engine and head on up. At 400,000 ft. and Mach 15 the Astroliner would open it's nose and release the upper stage booster which would propel its payload to orbit. The Astroliner itself would not go into orbit but would peak at 600,000 ft and set up for a reentry and horizontal landing.

The last configuration I heard was the Astroliner was an unmanned vehicle and it would deploy turboprop engines for a conventional runway landing. I'm reserving comment on those two design "features".

Since KST is trying to raise a lot of money (instead of just a lot of eyebrows), they came up with the idea of using an existing delta wing vehicle and tow plane as a low cost proof-of-concept. That is the Eclipse Demonstrator project. The tow airplane is an Air Force C-141 and the tow vehicle is a modified F-106 called the Eclipse Experimental Demonstrator (abbreviated EXD). All of the tow attachment hardware is contained on a pallet in the rear of the C-141 (its rear cargo petal doors are removed for the flight). The EXD weighs 24,000 lbs. empty and will launch with about 4500 lbs of fuel. The engine will be at idle (and the speed brakes deployed) which gives an L/D of around 5/1. The idling engine is required to power the hydraulic flight controls. It also has the benefit of providing full flyaway capability from a rope break or release at ANY altitude (that old J-75 engine is pretty amazing -- you haven't lived until you've felt its afterburner ignite!).

The tow rope is 1000 feet of 3/4 inch diameter Vectran with a tensile strength of 60,000 lbs. Vectran is extraordinarily strong but very stiff (little elongation). The entire length only weighs 200 lbs. If I remember correctly, Vectran is technically a "liquid crystal polymer" and the only other use I know of it is.... paraglider suspension lines! To help absorb tension transients, 50 feet of nylon webbing is spliced into the mid-point of the tow rope. This significantly increases the stability of the tow, decreases peak load transients, and eases pilot workload. Incidentally, the tow release and attachment hardware is a B-52 drag chute release mechanism (reversed to point forward, of course) and the rope end fitting attaches to the metal weak link and drag chute hardware. The weak link will fail at 23,500 lbs +/- 200 lbs.

If you haven't guessed by now, I am the project pilot on the EXD. While I consider it a great job, I have to put up with snide comments to replace "Forger" as a nickname/callsign. These include "dope on a rope" and "drag queen". (They're just jealous!) The aircraft has been modified and I've successfully flown it to check out the instrumentation, calibrate the air data, and generate some ground effect and wave-off data. We've also practiced all tethered ground operations up to starting the takeoff roll.

OK, so what about wake turbulence? To keep from making this post too lengthy, suffice it to say I have flown at various distances behind the C-141 (as well as a 747) for the purpose of quantifying the location, strength, and effect of the wake and tip vortices on the F-106. The turbulence isn't too big of an issue with only 1000 feet of separation between the two aircraft (a few miles would be much worse). It doesn't really matter anyway since I will never be high enough to encounter the wake.

Since the EXD lifts off significantly faster than the C-141 and since it's delta wing and high wing-loaded configuration implies the wing will be working harder (higher angle of attack) than the C-141, I decided early on that a low tow position would be best. As the program gained momentum and we got more information and simulation data, we found that low tow was the only possible way of towing these two aircraft. (Don't infer that means the Astronliner would have to do a low tow).

For a year or so Bob Mackey has served as an occassional sounding board for a lot of my ideas regarding this tow project --- it's amazing how much it has in common with aerotowing a flexwing.

Although not a classified program, there has been an information "blackout" on it until very recently. It is still not mentioned on our web page but some pictures are available at http://www/gallery/photo/Eclipse/index.html.

Forger

NASA - Dryden Flight Research Center

P.S. Feel free to write, I don't read all the digests but I do try to answer mail and will post to the digest when I think it makes sense.