

FLIGHT LINE

THE PUBLICATION OF THE WINGS OF ROGALLO
NORTHERN CALIFORNIA HANG GLIDER ASSOCIATION
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Cindy Cox's dramatic shot of the mighty mountains of Florida!

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The Editor's Turn

Another year is drawing to a close, and by and large it's been a good year. Oh, I'll admit that business with the broken collarbone was not a terrific amount of fun, it was pity about my poor old Fusion, and I did miss a few months of airtime, but by and large, your Editor had a great time, and that new LiteSport is awesome. The season is ending on a resounding note, with some great flights at Mission. How about the rest of you? Let's hear some stories. There's still time to get your entries in for the *Flight Line Hang Writing Competition*.

We now have a year of experience with the digital version of the newsletter, and almost half of you are receiving it online. This has saved the club money, and more important, it has allowed us to keep dues down in the face of a substantial increase in printing costs. The **WOR** Executive Committee is considering a slight change in the dues structure to give a break to members who subscribe online. Nothing is set in stone yet, so please, send us your input, tell us what you think, and let us know what you think about the World Wide WOR.

The WOR Logo Competition is also drawing to a close, so be sure to cast your vote. It's important! In the very near future, after our club has succeeded in its plans for world conquest, this is the emblem that will appear on the flags of our world-conquering army, navy, air force, and our legions of chase drivers. So we'd better be sure to pick a good one, right?

November Mission

Ridge Report

by Steve Rodrigues

The **EBRPD** is currently re-seeding some trails and other erosion prone areas in the preserve. Please

avoid walking or driving on seeded areas, and never take shortcuts across the switchbacks.

Progress is being made towards opening the East launch on Mission Ridge. The PG assessment team has completed their report, but the HG team needs more flights in stronger conditions. I am holding up our report to the **EBRPD** until we are confident of our assessment. If you are skilled in soaring strong winds, and want to participate in the assessment, please contact yours truly.

In the rules department; Please remember to drive slow in the preserve. The speed limit is still just 5 mph!

Carmela Moreno has updated the lock box with a current list of **WOR & USHGA** members. Thanks Carm!

October 2002

Meeting Minutes

by Paul Clayton

NEW MEMBERS/GUESTS

Colleen Brogan - flies a Pulse.
Yishi Hope - flies and Eagle.
Guynal - flies a Falcon

GREAT FLIGHTS /TERRIBLE FLIGHTS

Art Thompson - did 3 flights at Ed Levin in 1 day.

Mark Mullholland - made his 1st flight in a long time.

Pat Denevan - flew Funston on a classic day.

Tom Mook - Flew the PG nationals in the Owens Valley; 40 to 50 miles each day, 16000 ft+; Jody Lucas and Martin? were seriously injured, another pilot was killed the day before the meet started.

George Morford - made goal several times and set personal bests for distance, altitude, duration at the PG nationals.

A pilot launched unhooked at Diablo, without injury. A PG incident occurred at Ed Levin, also without injury. A pilot hit a tree on landing approach at Dunlap, suffering serious injury; there was a report of a tree landing/crash at Hat Creek.

PRESIDENT'S REPORT - None

VICE PRESIDENT'S REPORT - George Morford

A work party is planned to move Jody Lucas's belongings from his apartment this weekend.

TREASURER'S REPORT - Don Jones

Bank of America is now offering free online banking. Don and Steve Rodrigues are looking into it.

MEMBERSHIP COMMITTEE - Carmela Moreno

The 2003 stickers are now available. We may not use Paypal for renewals this year. We now have 528 members, with 310 taking Flight Line by mail.

FLIGHT DIRECTOR'S REPORT - None

ED LEVIN SITE COMMITTEE REPORT - Steve Pittman

A H1 pilot blew a launch, on a launch for which he did not have the proper proficiency sticker. He has been suspended for 4 months. A red sticker PG pilot landed on the golf course. Action is pending. Proficiency stickers are being checked.

MISSION PEAK SITE COMMITTEE REPORT - George Morford

The gate at launch is still there, but does not need to be closed.

MT. DIABLO SITE COMMITTEE REPORT - Mark Grubbs

A pilot recently launched from the towers launch without hooking in. Pilots should check each other on launch to prevent this sort of incident. The park rangers are checking stickers and USHGA cards.

SITE ACQUISITION - Gene Pfi-
fier

There is a potential airspace issue at Coyote Lake due to the proximity of South County Airport. A test flight from the proposed launch site is planned.

COMPETITION COMMITTEE - None

NEWSLETTER - Paul Gazis

The executive committee mailed this month's newsletter.

OLD BUSINESS

Eric Froelich distributed landing streamers purchased with club funds.

Urs Kellenberger reported that Bald Mountain is a possible new site.

Pat Denevan reported that Felix Rhule, designer of the ATOS and other rigid wings, will be at the next meeting.

NEW BUSINESS

Tim West requested \$200 for travel expenses so he can attend the USHGA BOD meeting. A motion was approved to give him that amount.

Entertainment was Mark Mullholland's video from a tow meet in Florida.

MONKEY BUSINESS

Don't you wish...

END OF MEETING MINUTES

[In the last issue of the FLIGHT LINE, Mike Vorhis discussed how Pilot Induced Oscillations and get started. In this issue, he will talk about damping, and how to make oscillations stop]

Pilot-Induced

Oscillations - II:

A Simplistic Primer on Out-of-Control Hang Gliding
by Mike Vorhis

Damping

As we noted earlier, if an oscillation cycle is met with passive resistance that increases as an error increases, then it is said that the oscillation is "damped." Different degrees of damping-different passive resistance strengths-will cause an oscillation to die out at different rates. Highly damped systems will oscillate minimally or immeasurably; lightly damped systems will see oscillations die out after some number of weakening cycles. Damped systems are also less prone to having an oscillation start to begin with, and most entry-level gliders have natural oscillation damping built into their design for the normal operation speed range. Higher performance gliders will be lightly or very lightly damped, and it is this reason that PIOs are commonly experienced by pilots when they begin to transition to higher-performing equipment, or any equipment with feedback lighter than what their muscle-memory recalls.

Phase Cancellation

If an oscillation is met with input that contributes to its error on each cycle, of course it will build alarmingly for each successive cycle. But if an oscillation is met with deliberate active input that opposes its error on each cycle, then that input represents an oscillation in opposition to the original. Such a pilot-applied oscillation can "cancel" the error

and the original oscillation, because it is out of phase with the original. Figure 3 illustrates.

Even slight phase differences will cause eventual cancellation. But the danger and the reality is that active cancellation typically only results in a new uncontrolled oscillation at another resonant frequency, or at the same frequency but a new phase. The reason is that a pilot cannot normally feel the effect of active cancellation accurately enough to minimize its strength correctly for each successive cycle. It is in fact the attempt to actively cancel short-term oscillations that is the overwhelming cause of problematic multi-cycle PIOs. In other words, actively canceling oscillations by reversing them cycle-for-cycle is a strategy that will get you into twice the trouble you think you're in.

Methods of Eliminating PIOs

* Gain familiarity with the system. Properly designed gliders will not oscillate appreciatively without pilot input sustaining the oscillation. Getting the "feel" of a glider over time will go a long

way toward reducing PIO occasions. (Effectively, this approach trains a pilot's reactions to use timing and strength that will not add to an error in one of the resonant frequencies of the system.) If demoing a new glider, gaining familiarity can include flying at landing pattern speeds while still at altitude, to ascertain the effect of control inputs at those speeds while it is still safe to do so.

* Remove the input that is sustaining the oscillation. This is the most common advice given to beginner and intermediate pilots. As most gliders have sufficient damping built in to handle oscillations that are not being exacerbated by the pilot, simply letting go of the control bar (or rather, going quickly to trim and applying no more inputs than are required to avoid hitting hills, trees, wires, or houses) will see the oscillation evaporate quickly. After all, the PIO is "pilot-induced." Stop inducing and the problem goes away.

Other than telling the glider nothing, another way to ensure that oscillations are not being induced

by your correction attempts is to tell the glider everything. That is, make a correction and then hold it, effecting a turn instead of a levelling. Feedback is usually strong in a turn, which helps damp the transient motions. Just be careful to level out smoothly and avoid re-initiating the wobbles.

* Change the resonant frequency of the system. Changing the dynamics of the system can cause it to attempt to resonate in another frequency, which results in phase cancellation of the oscillation currently underway. An effective way to do this is to change the length of the moment arm at which your weight is applied. Bearing down momentarily (and that means momentarily) on the control frame with a bit of your weight effectively changes the torque that weight is applying to the system, and changes the possible frequencies of oscillation, typically resulting in at least some phase cancellation of the immediate problem.

It is important to realize that re-distributing weight application by

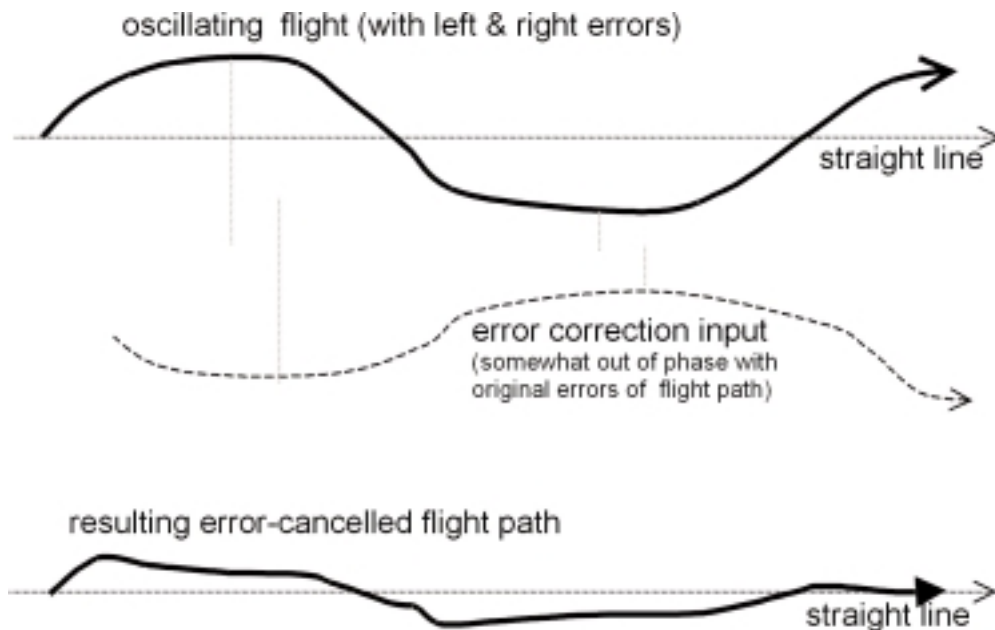


Figure 3: Active Phase Cancellation (via Error Correction Input)

bearing down on the control frame is an advanced maneuver. Most instructors do not teach or advise this technique, as it is difficult to explain how long such a "momentary" weight application should be sustained, or with how much force. And the practice can lead to other problems. But to claim this technique does not work is incorrect, and robs us of understanding this particular dynamic of the system. Changing the system's resonance profile will have an effect. It is one more trick in the bag, which just might save you someday in some rowdy high desert landing attempt, or if a broken wing begins to go out of control. Practice it sparingly, at altitude, and keep it as a last resort.

One reason such an unorthodox trick is worth remembering is that pilots are not the only means by which an oscillation can be induced when you least need it. Attempting to set down amid sage brush and dust devils, other forces can blast you into a few cycles of oscillation, and you don't always have the option of releasing the control bar. Northern Nevada icon Ray Leonard once told me that when penetrating into high winds on final, he occasionally has placed a knee onto the base tube momentarily, to damp out oscillations and get level. Although he hadn't applied engineering analysis to the move, he knew that it worked. What he was doing was putting some of his weight on a 4-foot lever instead of the keel, changing the resonant frequency of the system until phase cancellation brought the oscillation under control.

Now, Ray is a fiercely independent sort, not always given to automatically adopting the official line; so it isn't surprising that he would develop the occasional highly effective if somewhat unorthodox technique. Definitely the preferred method of apply-

ing some pressure to the control frame would be via the hands, and only for a second or so, and only after having worked with an analytically minded instructor on it and practiced it a lot with clearance, and only when more advisable techniques can't be utilized. Understand the physics of it by all means, but DO NOT consider this your normal answer to PIO or you may well begin a new era of other poor landing habits, with their own possible catastrophic results.

PIOs have contributed to many serious accidents over the years, not to mention a fair few marginal reputations. We tend to focus so much on flare timing that we sometimes forget the overwhelmingly most important elements of safe landings have to do more with field accuracy and controlled flight patterns before ground effect is ever achieved.

A glider rider is a Pilot only if he or she can control the aircraft. Knowing what causes oscillations, what sustains them, what damps them, what cancels them, and what reduces their likelihood of occurring is the artillery needed to recognize and master them when they occur.

November 2002 President's Report *by Steve Rodrigues*

Official WOR Logo Vote!

The official WOR logo will be selected at the November club meeting. Thanks to some hard work, Paul Gazis squeezed all the contest submissions in the last Flight Line, and Greg Knepp got them up on the WOR website. Thanks guys!

Please pick your favorite design, and make your vote count at the upcoming meeting. This is important, as it will effect the

upcoming new T-shirts!

Please think about your choice of shirt colors and let me know what you prefer. I am thinking color logo on grey shirts.

November Ed Levin Report *by Steve Pittman*

H1 pilot suspended

On September 21, a Green Sticker pilot attempted to fly from the 600' launch. He blew his launch, but was not hurt. The pilot was suspended for four months. Green Sticker pilots can not use the 600' launch, with or without a sponsor.

Please note that Section X.A of the Site Procedures calls for a minimum of a four month suspension for using a launch without the required proficiency sticker on your helmet. And it calls for a minimum of a two month suspension for transporting another pilot who does not meet requirements. Please make sure you and your passengers have the helmet sticker required for the launch you are using. We hate to suspend people.

From The Perspective of a Newcomer

Some reflections after attending my first WOR meeting on Tuesday, October 15.
by Yishai Hope

Having recently gotten our Hang 2 ratings, my hang gliding buddy Gwenhaël and I decided it was time to get more involved with the **WOR** community and come to the meeting.

After the casual part of the meeting described as "chow," the offi-

cial meeting started and newcomers and guests were asked to introduce ourselves. Then it was time for the accident reports. Tom gave a report from the Owens Valley meet that got gloomier and gloomier as it went on. Most of the accidents involved paragliders. There were some injuries; one pilot was in a coma and one pilot died.

I was sitting there listening to this troubling report and thinking, "I should have been more thorough with my safety research and come to one of these meetings before I got hooked on flying, bought my glider, and made a commitment to this sport. I realize why you call this a **WOR** meeting—this sounded like a report back from the battlefield! Let me go back to Israel, where I felt safe."

It felt strange somehow to hear about a fallen pilot as part of a dry accident report. I am sure many of us were thinking, "it could have been me." I feel that news of a death merit some sort of ceremony, perhaps a moment of silence and a few personal words about the person followed by a toast and a cheer to celebrate a life well lived. I hope this will never be necessary in another **WOR** meeting, but should the occasion arise, I think this would help in assimilating and integrating such news. "Primitive" tribes understand the importance of ceremony, and we are after all a tribe of "WORriors."

This is a good opportunity to say how much I appreciate the generous spirit and welcoming attitude we newcomers have received from many veteran pilots. Teaching, helpful tips, rides to launch, sponsoring of the various tasks and all manner of volunteered acts that have helped us climb to greater heights safely. If you see me fly, please don't hesitate to offer your constructive feedback: I welcome it. I am planning to

keep a beginner's attitude for a long time to come. By the way, I don't think "Wack" falls into the category of constructive feedback and I wish we would uproot this tradition.

Thanks again for your support. It truly takes a village to raise a pilot...

October Mission Ridge Site Report

by Steve Rodrigues

Keyholder Suspended!

A Mission Keyholder received a 30 day suspension for not adequately checking for helmet stickers. All keyholders have been reminded of this issue, so pilots requesting a ride up the hill should volunteer to show their helmet sticker. Carmella has agreed to put a special Mission Ridge stamp on next years WOR cards to make checking easier. Thanks Carm! It is also very hard to follow up on things if we can't read your info, so please pay special attention to signing the log book clearly. Those who do not are also eligible for suspension.

The good news...

The gate at Mission launch may now be left open, and both the gate and fencing are due to be removed in the very near future! I hope to provide a work party to help the EBRPD achieve this. Many thanks to Dan Reasor for all his effort on our behalf. He really listens to our needs, and goes out of his way to help us out. For those of you who don't know, Mr. Reasor is the supervisor for the Sunol Ohlone, Mission Peak Regional Preserve. He has been a great supporter of hang and paragliding, and is always a pleasure to work with. Thanks Dan!

The Man Dan

by Faustina Miller

*In last months edition
anonymous tells a tale
of a pilot who flies Mission
who soars without fail
This sounds like a story
but it sounds kind of true
there was a good flyer
with a glider of blue
But that sure does seem
such a long time hence
since that certain blue glider
met up with a fence
Now it sure is different
since that certain bird-man
flying a W___ W___ glider
barely resembles The Man Dan*

Object Oriented

Aviation

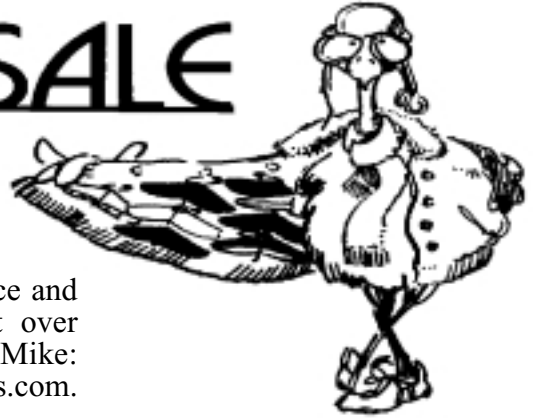
the HG++ Standards Committee

Traditionally, flight has been accomplished with structured aviation techniques, in which different aspects of the flight are executed by modules, and decisions are passed between modules as variables. This approach to aviation has many advantages, but it can be difficult to maintain, and it is inadequate to deal with long cross-country flights.

The new paradigm for flight is 'Object Oriented Aviation'. Under this approach, different phases of the flight are represented as 'objects' or classes'. The decisions and operations associated with each class accessed via 'functions' or 'methods'. For example, the 'launch' phase of the flight might have 'hook-in', 'balance', and 'clear' methods, while the 'landing' phase might have a 'flare' method which could have a 'nailed-it' or 'whack' outcome depending on the state of internal variables such as 'flareTiming', 'bodyPosition', and 'isWillsWingDuck'.

To be continued...

WINGS FOR SALE



Wings for Sale

(Ad policy: ads are marked by date run for 6 months, then are cancelled automatically unless they are renewed. Ads are free to WOR members)

Rigid Wings

ATOS 146. 10 hours, like new, 73 lbs, comes with water proof bag, cam helper. Pictures and details at <http://home.pacbell.net/gpesaven/tos.html>. Contact Gerry, 530-219-1954, or gerrypez@yahoo.com (8/02)

Buran 98 m. Like new, only flown once. Great tandem speed gliding wing. Complete with wheels and unique ballistic launch system. Contact S. P. Korolev Rocket and Space Corporation Energia <http://www.energia.ru/> (10/2)

Flexwings

Aeros Stealth III Oleg Racer 151. The 2001 Speedgliding Nationals were won on this glider (which has since been tuned back to factory settings). Very low airtime. Carbon crossbar, carbon faired base-tube, carbon Horner type wing tips. You can *steal* this glider from me for \$2150. Contact Rick Cavallaro 650-961-5735 (6/02)

Airwave Klassic 155. for sale. Contact Eric Hinrich 831 335-4292 (10/02)

Altair Saturn 167. 1999, one owner, only 68 hours. The perfect intermediate glider White, red, & black; extras. \$2,100. Call Bernhard at (925) 820-9682 or BernhardBoeSter@CS.com (8/02)

Seedwings Topless Sensor 144. Very low hours, still crispy, mostly used for a couple of speed gliding

meets. Excellent performance and handling. Best offer I get over \$2400 takes it. Contact Mike: (510) 770-0544 mike@vorhis.com. (10/02)

Wills Wing Eagle 164. 1 yr old, less than 28 hrs, like new because pilot switched to a K2. Contact Stan Boehm (408) 946-1328 (10/02)

Wills Wing Falcon 225. Orange, blue, white. Good condition, new wheels, extra parts for tandem. Includes ;large wheels and streamline downtybes. \$1200. Contact Gordon (415) 310-6602 (10/02)

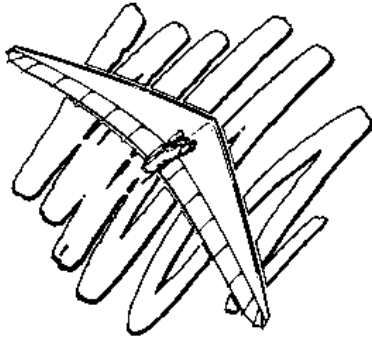
Paragliders

Inexplicably, there are still no paraglider ads. Is it something I said? Something I ate? I shower regularly and I try to give both types of pilots rides up the hill. Oh well. Life is full of mysteries.

Equipment

Finster Wheels: One complete set of Finster Wheels, with axles and corner brackets. Contact Paul Gazis at (408) 736-0764 or gazis@best.com.

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*Wings of
Rogallo*

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The next Wings of Rogallo Meeting will be... or.. uh... was held
Tuesday, November 19.
at the Summit Point Golf Club in Milpitas near Ed Levin Park
Check the Wings of Rogallo WWW Page
<http://www.wingsofrogallo.org/meetings.html>
for details and directions.

Entertainment at the meeting will be Felix Ruhle of AIR,
the man responsible for
the vast majority of all the rigid wing gliders ever built!
I don't want to miss this one...