American Institute of Aeronautics and Astronautics
Tucson Section

Newsletter

Volume 14
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April 2000

CALENDAR OF EVENTS 2000

- **Saturday, April 15 --** AIAA Student Design/Build/ Fly Competition, Wichita, Kansas.
- **Thursday, April 27 --** Dinner meeting. Jim Harford will talk about Soviet space program. 6PM, Plaza Hotel.
- **Memorial Day Weekend --** International Space Development Conference in Tucson. Co-sponsored by the Arizona AIAA sections and National Space Society (details TBA).

Next Meeting

An Evening of Russian Space History

Date April 27, 2000 (Thursday)

Time 6:00 PM

Speaker Jim Harford

Where Plaza Hotel
1900 E. Speedway Blvd
Tucson, AZ

Menu Mixed green salad with 2 house dressings
Chicken Marsala
Wild rice pilaf
Seasonal vegetable
New York style cheesecake topped with chocolate and raspberry sauce
Rolls and butter
Iced tea and coffee

Prices $15 - students w/ RSVP
$20 - members & 1 guest w/ RSVP
$25 - non-members and anyone w/out RSVP

RSVP Kevin Kremeyer at **882-7349** or tucson_aiaa@yahoo.com by 23 April

An Evening of Russian Space History

by Jerry Felmley

Our next dinner meeting will feature Jim Harford, Executive Director Emeritus of AIAA, who will discuss Russian space activities. Jim will have 35 mm slides of numerous facilities he's visited and Russian engineers and scientists he's interviewed during the writing of his biography of Sergei Pavlovich Korolev.

Korolev -- How One Man Masterminded the Soviet Drive to Beat America to the Moon is the only English language biography of this remarkable space pioneer.

Hardbound copies will be available at our meeting for purchase and signing by Harford. Jim and his wife, Millie, will be in Tucson for only a brief period so he's offered to conduct pre-arrival interviews by telephone for any interested media or professional groups. Please contact Jerry Felmley for local help in coordinating interviews at (520)529-0865 or e-mail: JJCatalyst@webtv.net)

Skydiving Adventure!

by Kevin Kremeyer

Welp...we drove Kelly to jump out of a plane! (But after her hectic week of cramming and review, we're going to make sure she stays far away from the Grand Canyon). Following our developing pattern of meeting, and then caravanning/carpooling, we packed it up to Eloy, Arizona. There we met our point of contact, Pat Patton, and our designated tour-guide and friend for the day, Sandy Reid. Not only did we have excellent representation from Tucson, but we were joined by some very enthusiastic and knowledgeable members from our sister-section in Phoenix (one of them even flew down in his own airplane!). It was very exciting to have such a fun and diverse group assembled.

Once we'd gotten over our awe at watching the skydivers jump out of planes, make beautiful formations, and then shoot apart like a firework to deploy their chutes, we began the presentation with Sandy. First he told us of his long history in parachuting, and how it led him to his current position with the school, and to his market-leading rigging company "Rigging Innovations Inc. <ri@primenet.com>".

We learned a great deal about the aerodynamic innovations that have been advanced by the sport-skydiving industry, and how much of that technology is being transferred to the military parachuting industry. The actual deployment mechanics were demonstrated to us with several exhibits and demonstrations, the most instructive of which was the chute-packing.

After we'd watched several different international groups practice their routines on the ground (dozens of adults laying face down and scooting around on these souped-up skate-board scooters, grabbing each others ankles and wrists...yes, it's true...), we headed to Sandy's factory (just a few hundred yards "off-campus"). There he walked us through the design and fabrication process of the harnesses and rigging that they create and produce every day. It was very interesting, and wonderful to have such a knowledgeable and capable guide.

Once the technical aspect was over, we bade good-bye to the bulk of the group, and we settled in to eat a good lunch and some ice-cream at the restaurant, while Kelly received her instruction from the school. We were able to pass some more time pool-side, eating ice-cream from one of the many shops centered on the campus.

It's really a nice environment and worth a trip, even if you don't intend to don a parachute. It's actually quite a popular spot for visitors and tourists, since it's the skydiving mecca of the world. Kelly will write about her fantastic experience in the air, and if you want more of the factual details, please visit http://www.skydiveaz.com

Again, don't forget your AIAA discount on a first tandem jump. Kelly's testimony should convince you that the experience is well worth it.

Tucson Soaring Club Visit

by Rina Shivashankara

On Saturday, April 8th, the Tucson Section visited the Tucson Soaring Club at the Gliderport in Marana. Club member Bill Rogers invited the AIAA to see what the Club has to offer. The Club consists of glider pilots who pay dues -- in exchange, they can use the Club's gliders for free, paying only for the tow. The Club has six different kinds of gliders, in addition to three tow planes.

Gliders are unpowered aircraft with very high lift-to-drag ratios. Some of the club gliders had glide ratios of approximately 41:1. This means that at an altitude of 1 mile above sea level, a glider could coast for 41 miles without reaching sea level. Gliders frequently carry ballast in the form of water. Some of the gliders we looked at carried up to 400 lbs of water on board.

The glider is attached to a tow plane with a long tether. Long tethers are used to minimize the impact of the gravel, kicked up by the tow plane during take-off. Once at altitude, the glider releases from the tether, the tow plane turns left and the glider turns right with no further assistance from the tow plane.

Arizona has ideal weather for soaring because pilots can soar all year. Other parts of the country with good soaring are places like Denver, Colorado, where the gliders must be kept out of the elements during the winter.

There are three types of soaring: wave, ridge, and thermal. Wave soaring is accomplished downstream of a disturbance in the air. Mountainous areas are where wave soaring is used. Ridge soaring is common by the Appalachian Mountains where there are sharp changes in the topography. However, these types of soaring are seldom used in Southern Arizona. Thermal soaring is the most commonly used.

Glider on takeoff roll

By examination of the clouds and a little bit of trial and error, the pilot finds the rising hot currents to provide the needed lift. For good soaring, some unstable air is required. On the day we visited, the wind was strong. The pilots informed us that it was a good day to soar, but it might be a little bumpy. Just like flying powered aircraft, flying an unpowered glider has rules and restrictions. A pilot can go above 12,500 feet above sea level without oxygen for 30 minutes. Without oxygen, the limit is 14,000 feet. With oxygen, however, a pilot can ascend to 18,000 feet before entering Class A airspace. To be able to enter Class A airspace, the pilot must first receive permission from the FAA.

One of the members of the Tucson Soaring Club, John Rader, gave the Tucson AIAA a tour of the hangar where some of the gliders are kept. One of the gliders we looked at was a Polish glider built in the 1930's. It is very rare since many of these were destroyed by the Germans during WWII. Surprisingly, the glider is still airworthy, though built of wood and cloth. Modern gliders are made of a Kevlar reinforced fiberglass. Mr. Rader showed us a two-seat glider and commented on the comfort of flying in it. He then contrasted it with the very modern PW-5, which is much smaller since the cockpit only holds one person. The handling characteristics of the smaller, newer aircraft was much better than the more comfortable two-seater.

Bill Rogers then showed us the Discus 2a. It is a newly acquired glider boasting a polyhedral wing with a swept-back leading edge. It is a beautiful design and a tight-fit for anyone over 6'0". We also saw some acrobatic gliders capable of a number of stunts slow rolls, lazy 8's, and loops.

Kelly trying on Discus 2a, as Jason Blauert (left) looks on

We then met Mike Parker, a racing pilot, who was working on his LS-8. The LS-8 is an unflapped racing glider. Mr. Parker set two world records in this ship, and he discussed with us some of his racing strategies, including his sophisticated suite of computational diagnostics/software (linked to his GPS and pressure/altitude sensors) to optimize his flight path.

He achieved a coveted Diamond rating by accomplishing a 16,600 ft ascent while staying below Class A airspace. Since the El Tiro Gliderport is already too far above sea level to legally achieve this, he took off from the Gliderport and flew to Gila Bend, which is lower. He descended to 500 ft above the ground (1000 ft above sea level) and proceeded to climb to the top of Mt. Lemmon. He had only 400 ft more before entering Class A airspace.

The Tucson AIAA visit to the Tucson Soaring Club was very informative. We appreciate Mr. Rogers, Mr. Rader and Mr. Parker taking the time to share their immense knowledge of the sport of soaring with us. If there are any questions about joining the Tucson Soaring Club, we will be happy to direct you to the right person.

They also mentioned that their land might be affected (either beneficially or adversely) by the recently proposed ironwood conservation area. The club would, of course, be very grateful for any insight into such matters.

Tucson Section Officer Roster 1999-2000

Chair:	Kevin Kremeyer
Secretary/Treasurer:	Kelly Sinnock
Membership:	Rina Shivashankara
Webmaster:	Robert Wagoner
UA Faculty Advisor:	Larry Scott
Education Chair:	Rajka Corder
Military Liaison:	Ed Palanek
Newsletter Editor:	Frank Manning
Support Staff:	Jason Blauert

Web site: **http://www.aiaa.org/sections/ts/**

Skydiving–First Tandem Jump Experience

by Kelly Sinnock

Skydiving is something I've wanted to try for a long time. So, when AIAA decided to venture up to Skydive Arizona in Eloy, I decided to take full advantage of the trip.

I thought about if for a long time before making the phone call, but as my husband and mother put it, "You'll be mad at yourself if you come back without jumping." Before leaving for Eloy the morning of March 25, 2000, I called Adventures In Skydiving (the school at Skydive Arizona) to reserve a spot in the 2 p.m. tandem jump class.

Once we arrived at Skydive Arizona, Sandy Reid gave us a very interesting talk on parachutes and skydiving followed by a tour of his business (Rigging Innovations), as Kevin mentioned in his article. After our AIAA tour was over, I went over to the school where the class was being held and things got underway.

It seemed to take longer to fill out all the paperwork than it did to receive the jump instructions. Since an experienced instructor would closely supervise us during the tandem jump, not a lot of detailed instruction was required. Once we finished the class, they started organizing flights. Unfortunately, due to the popularity of the 2 p.m. class and the extra activity from a competition taking place, it was a long wait for students to be paired with instructors and the flight to actually take place. Fortunately, it was definitely worth the wait.

Once my assigned instructor returned from the previous jump, we had 10 minutes to get geared up before boarding the bus. So, I put on a jump suit, the instructor put on my harness & wrist altimeter and off we went to the bus. After the short ride to the ramp, we boarded the running de Havilland Twin Otter.

de Havilland Twin Otter with Kelly on board

Once everyone was aboard, we took off and started climbing to the jump altitude of 13,000 ft. above ground level (AGL). At about 8,000 ft. AGL, the instructor connected our harnesses together very tightly and we got psyched to jump. He quickly went over the procedure again, I put on my goggles and we were ready to go. We got up to the desired altitude within about 10 minutes after takeoff. Once the pilot gave us the green light to jump, the instructors closest to the door slid it open and the fun began.

Since we were the first group to enter the aircraft, we were the last group to exit. We slid down the bench to the open door and *Whoa! What was I thinking???* We stood at the open door with the brisk air blowing past us; the instructor counted 1-2-3; and out we went.

Before I knew it, we were out the door plummeting to the ground. After getting over the initial sensation of jumping, I concentrated on keeping my eyes open and remembering what to do. With my arms crossed, we were staring back at the perfectly airworthy aircraft continuing on its flight path at 13,000 ft. AGL. Quickly, we flipped face-down, extended our arms, arched our backs and relaxed as we continued on a 50 second free fall to 5,000 ft. AGL.

It was hard to keep my mouth closed while going 120 mph, so I just relaxed and enjoyed the adrenaline rush of free falling. We turned to the right, then to the left in order to stay on course for the jump field. At 6,000 ft AGL, I got ready to pull the orange rip cord on my right hip.

Then at 5,000 ft. I looked down and pulled the rip cord, which in turn perfectly deployed our 400-sq. ft. rectangular parachute.

My ears quickly equalized in one giant *POP* and we calmly floated under our rainbow-colored chute. We maneuvered using the steering toggles and enjoyed about 5 minutes of relaxing parachuting. Not only did we do a few steep turns, but we also simulated landing by flaring to a near standstill in mid-air. After taking a quick glimpse to enjoy the scenery, we did a few more steep turns and one more simulated landing.

Kelly and instructor

Then, we steered toward the jump zone and got ready to land. Once on final, I did just as instructed: relaxed the toggles by raising my arms, raised my legs, and flared. After we flared, my instructor said, *stand up*, and lo and behold, there was the ground. A picture perfect, four-point landing bringing us right back to where we started.

Overall, I had the thrill of a lifetime, and I have no regrets whatsoever. It was a definite adrenaline rush that words cannot fully describe. Although I don't plan to pick up skydiving as a new hobby, I wouldn't have to think twice about making the phone call next time. If the opportunity arises, I will jump again, tandem of course.

After landing

Elections

by Kevin Kremeyer

In our next newsletter, we are going to include return-addressed ballots which you'll simply need to fill out and return. We're trying to iron out an email option for this, which will remove your anonymity, but will hopefully facilitate participation. The election newsletter will contain all of the details and directions.

The first step is to get some nominations together. The offices for which nominations are being accepted are: Chair, Vice-Chair, Treasurer, Secretary, and Vice-Chairs for both membership and public policy.

The deadline for these nominations is May 10th, and we anticipate most of them to be offered at the dinner meeting on April 27th. You can also send them via email or USPS.

Once the nominations have been made, we'll confirm the interest of the nominees. Bios, CV's, and photos will then be collected and compiled for the election newsletter. The last votes will have to be in our hands (or account) by June 10th, and the results will then be compiled and reported in the ensuing newsletter.

I can tell you from personal experience, that participation and involvement with this group is an enriching and enjoyable learning experience.

If you know of any qualified, enthusiastic people who want to get involved, please don't hesitate to suggest them for office. We have a number of other programs which are growing such as education outreach and professional development. There is a lot of reason for excitement in both of these areas.

Notes from the Chair

by Kevin Kremeyer

Welcome to Spring (and the hot weather around the corner)!

We've had a couple of very exciting meetings since the last newsletter, and we have two very important things to remind you about. The first is the dinner meeting coming up next week, and the second is to let you know the timeline for the upcoming elections to fill the officer positions for next year.

I have to emphasize how much we'd like to see a good turn-out for the dinner meeting. If you can arrange your schedule to accommodate the evening, we'll make it worth your while with an interesting program, good company, and a tasty menu.

Please, also pass the word on to anyone who might be interested in Space; Russia's contributions to this field; or simply in making contacts within the AIAA and Tucson's aerospace community. We're really looking forward to meeting yet more of our membership, so don't hesitate in RSVPing.

AIAA
American Institute of Aeronautics and Astronautics
Tucson Section
P.O. Box 90772
Tucson, AZ 85752-0772