



THE LEADING EDGE

NEWSLETTER OF MUROC EAA CHAPTER 1000

Voted to Top Ten Newsletters, 1997, 1998 McKillop Award Competition

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<http://www.eaa1000.av.org>

April 2000

Chapter 1000 meets monthly on the third Tuesday of the month in the USAF Test Pilot School Scobee Auditorium, Edwards AFB, CA at 1700 or 5:00 PM, whichever you prefer. Any changes of meeting venue will be announced in the newsletter. Offer void where prohibited. Your mileage may vary. Open to military and civilian alike.

This Month's Meeting:



Flight of the Turkey Vulture

Tuesday, 18 April 2000
1700 hrs (5:00 PM Civilian Time)
USAF Test Pilot School Auditorium
Building 1864
Edwards AFB, CA

A great big "All Right!" for this month's meeting sports fans because this month we have Bob Hoey giving us one of his ever popular and scientifically correct presentations, RESEARCH on the STABILITY AND CONTROL of SOARING BIRDS using RADIO CONTROLLED GLIDERS.

But first a little about Bob:

Bob was born and raised in Renton, Wash. and attended the University of Washington, graduating in 1955 with a B.S. degree in Aeronautical Engineering. In 1977 he also earned a Masters Degree in Systems Management from USC.

He worked for 32 years as a flight test engineer and supervisor at the Air Force Flight Test Center, Edwards AFB. He was heavily involved in the early Air Force stability and control testing of the Century Series fighters (F-100 to F-105). Bob was the primary AF Flight Test Engineer on the joint AF/NASA flight testing of the X-15 rocket-powered research aircraft. He then headed up an Air Force test team that accomplished the joint AF/NASA

testing of the Lifting Bodies (M-2, HL-10, X-24A, and X-24B).

In 1977 Bob was appointed Chief of the Office of Advanced Manned Vehicles where he served as the Air Force focal point for Space Shuttle activities at Edwards, as well as other research and one-of-a-kind aircraft testing at Edwards.

In 1987 Bob retired from government service and became a part-time consultant assisting in technical and safety reviews for new aircraft, assisting in simulation development, and serving as flight test advisor to various contractors. (continued on page 2...)



Ninth Annual Scotty Horowitz Going-Away Fly-In--20 May 2000, Rosamond Skypark

I trust you've already made room on your calendar for the fly-in event of the season! Rosamond Skypark will be abuzz with way cool EAAers like yourself, and you'll want to be there. This is Chapter 1000's annual big event where we invite area EAAers to come hang out with the **Project Police**. Watch next month's newsletter for the details. At press time, the details were still CLASSIFIED, especially since we haven't worked them out yet. Come to the meeting to see if we let any leak out.

HEY DUES DELINQUENTS!!!

You're being cut off!



Yep, this is your last newsletter. You can, of course, still avert this disaster by forwarding your dues check (\$20) in according to the directions on page 8.

This is the last time we'll remind you. You're on your own now.

We'll publish the 2000 Chapter Roster in the May newsletter.

This Month's Meeting (continued)

Bob has also been an active pilot and participant in the custom-built aircraft movement. He and a partner constructed a BG-12B, single-place, all-wood sailplane. It was first flown in June of 1968 and has accrued 645 hours of flying time. Bob eventually became the sole owner and earned his Silver, Gold and Diamond soaring badges in the airplane between 1968 and 1970. (U. S. Diamond Badge #144, International #861)

In 1973 he began constructing a BD-4, a 4-place, powered airplane. He made the first flight in July 1979 and has since accrued 870 hours of flight time. He continues to fly and maintain it. He and his wife have traveled over much of the U.S. in the airplane, including 3 trips to the Oshkosh Fly-in. Between 1993 and 1996 he, and several other members of EAA, oversaw the construction of a Kitfox by 7th and 8th grade students at a local public school. He performed the 1st flight and completed the flight testing of the Kitfox in 1997.

Since early 1990 Bob has been independently studying the stability and control characteristics of soaring birds through the use of radio controlled models. He reported initial results at the 1992 annual AIAA Flight Test Conference.



Now that you can see that Bob knows what he's talking about here is a little about the presentation.

In 1990 Bob began a study of the stability and control of soaring birds using full-scale, radio controlled glider models of a Raven. The Raven models were air-launched from another radio-controlled airplane providing a consistent and repeatable method for conducting the tests. Various control schemes were tried. Successful flights were eventually accomplished without any vertical stabilizing surfaces, and using tail-tilt for roll control in a manner similar to that observed on real Ravens. Results of these tests were presented at the AIAA 6th Annual Flight Test Symposium in 1992. These earlier test results will be summarized with charts and video segments to help establish the source of lateral-directional stability for a soaring bird, and to set the stage for the more recent research work.

During the past year successful tests have been conducted on full-scale, radio-controlled glider models of a Raven, Turkey Vulture, and Seagull, using a different lateral control scheme. This concept assumes that the

forward tip feathers of a soaring bird are actually functioning in the upflow region OUTBOARD of the primary lift vortex. Theoretically these feathers can produce both lift and thrust while operating in this flow field, thereby providing proverse yaw when deflected differentially for roll control. The simple control mechanism will be described along with videos of the bird models in flight. Results of water tunnel tests conducted at NASA Dryden on a semi-span model of the Raven wing provide a visual perspective of the flow over the wing tip feathers.

Well, as you can see we're in for a fun night, so come on out and partake of the festivities. Bob will have you riveted bonded to your seat (us composite guys have to get some press once in a while). And as always come and enjoy the chips and dip and the fine dining at the BK Lounge afterwards.

- **George Gennuso**
Vice Kommandant and Schmooze Meister

Last Month's Meeting Gathering Project Tour

EAA Chapter 1000

Quartz Hill, Fox Field, Rosamond
1700, March 21, 2000

Gary Aldrich, Presiding

We're still waiting for Secretary **Bowen** to get the minutes in for the February and March meetings. Instead of playing the Jeopardy! think music (tough to do in a paper medium), we will show you some pictures captured by your sometimes alert Newsletter Editor.



Brian Martinez holds court, keeping the accumulated masses enthralled with the detailed description of his process for creating his own molds and heat-curing the parts in the molds. Who is that nefarious character on the right side of the photo? It sure looks like past Secretary Chuck Firth!



The accumulated masses standing enthralled.



What's left of a Cessna 310 after a couple of years of "As long as I'm in here, I might as well fix this." Believe it or not, this is after reassembly has started!



Bill Irvine (right) proposes a deal to Miles Bowen to disassemble his Harmon Rocket II



Master *Project Police Picture Pointer* George Gennuso correctly identifies a Cleco® and asks "Don't you just bond these parts on with epoxy?"



***Project Police Picture Pointers in Training* Gary Aldrich and Bernie Bakken offer George their opinions on where that oil leak that has since disappeared may have come from. Chapter 49 President Ron Wilcox needs more training, as he missed identifying the airplane altogether and is pointing at Bernie.**



The *Project Police* congratulate Opie on what a fine job they did attaching the Glasair wing for him

**- Erbman
Pseudo-Secretary**

THE LEADING EDGE

The Prez Sez...

Wow! Spring has sprung and the flyin' weather is upon us. (Now that I've said that, it'll probably snow...) I hope everyone is gearing up to support the Chapter Fly-in coming up next month. We're planning on the same level of 'laid back' aviation as last year, but we'll need booth-erectors, air-vehicle-parkers, bratwurst-burners, etc. Don't wait for a Chapter officer to contact you...call them and volunteer!

Speaking of volunteers, the response to my request for Young Eagle Coordinators has been "under-whelming". I'm sure everyone out there understands the importance of this program to our continued general/sport aviation revival in this country. You don't have to look any farther than the local newspaper editorial pages to see that there is a vocal and strengthening anti-airport population in America today. Why do they want to turn our runways into mall parking? Well, one reason may be that they don't know the thrill of private flying or the benefits of general aviation to their community. And it's just not good enough to let the "alphabet organizations" do all the education. One of the absolute best ways I know of to turn that attitude around is to grow a new population of airport-friendly folks that remember their Young Eagle flight as a positive exposure to aviation. Anyway, I'll get off my soapbox....you get on the phone and call **Dave McAllister** or **Dave Webber** and offer to give them a hand. Do it for the kids...and do it for the good of aviation. See you at the rally, the fly-in, the 'gathering', or just around the airport!

Fly Safe and Check 6!

- Gary Aldrich
Kommanding

New Members

This month we welcome two new members to Chapter 1000, both from the hallowed halls of TPS. **Chris Shearer** is a Flight Test Engineer student in TPS Class 00A who saw the obvious benefits of belonging to such a cool chapter that also happened to meet right there at work. Chris married **Lisa** right before moving to Edwards to start TPS (what a way to start a marriage). Chris describes Lisa as the perfect EAA spouse, specifically stating "she likes my toys." It's a good thing, too, since they currently have an **Acroduster II** fuselage in garage of their on-base house, and wings and things strewn throughout the house in various rooms. Don't be surprised if the **Project Police** schedule a visit in a few months. Chris already has a Private Pilot Certificate with an Instrument Rating and a Tailwheel indorsement. **Scotty Horowitz** managed to make progress on his project while attending TPS—we'll see if Chris can do the same.

From the other part of TPS (the staff) we welcome **Kevin Prosser** back to the chapter. Kevin is a test pilot and the chief of our Flying Qualities branch. While not teaching students the intricacies of flight testing aircraft, Kevin is building a Fisher Super Koala. For his aviation

accomplishments, he calls himself an old AND bold pilot who is still alive!

Rocketman!

(If that title makes you think of an Elton John song, you're at least as old as I am...)

The following photo was uncovered at the EAA Chapter 49 Annual Awards Banquet of **Miles Bowen**, who not only works at that location that the locals here at Edwards refer to as "The Rocket Lab," but is also building a Harmon Rocket II. It's tough to tell from a photo if Miles was making airplane noises...



airbum.com Launched!

You've no doubt read many of Budd Davisson's



articles in your favorite aviation mags. Ever wish you could read them again? Ever wonder what you've missed? Well, you're

in luck! Budd has launched his own web site to archive his stuff, plus publish stuff not seen anywhere else. Following is Budd's own press release about the site, presented in the popular question and answer format. *(Budd is an extra cool guy—we know this because he is getting ready to build a Bearhawk. The **Project Police** may just meet up with him at Copperstate—ed)*

Q. What is AirBum.Com?

A. AirBum.Com is both an archive and a living magazine that speaks to the subject of sport and recreational aviation as well as miscellaneous neat stuff. It archives 30 years of writings and photos by Budd Davisson and features new articles on a wide variety of subjects, some of which may surprise you.

Q. What kind of subjects are we talking about?

A. As an example, the pipe section, tells you what it's like to fly a bunch of different airplanes ranging from the T-37 Tweety Bird jet to the BD-5. The article section has features like How to Make an Aluminum Wing Fairing,

Spot Landings Simplified, Zen and the Art of the Weld Puddle, Risk Management.

Q. What are the primary departments?

A. The site is broken up into the following sections:

PILOT REPORTS- 25 reports are presented which will grow to over 100 by years end.

GRASSROOTS/EDITORIALS- Several dozen sometimes serious, sometimes off-the-wall columns are featured. The list will grow.

PHOTOS- 300 aircraft photos are presented and more will be added each month.

FICTION-Budd's novels are introduced along with a way to purchase them.

NEAT SH-T (sic)- Neat stuff is tossed in like a photographic visit to a real ghost town, and a 1/4 scale OX-5. A continuing series on building a flintlock rifle will start next month. This is the most fun and unpredictable area in the site.

PITTS CORNER-All sorts of Pitts Specials articles and pictures.

CHAT ROOM- won't running until next month but is a place for birds of a feather to sit around and pick each other's brain on any subject.

Q. You make it sound like the site will always be growing.

A. Absolutely! We'll be adding at least 5-10 articles and pilot reports a month. In addition, we'll be presenting articles that won't appear anywhere else.

AIRBUM.COM: IT'S FUN, INFORMATIVE AND UNPREDICTABLE (*sounds kind of like the Project Police section of the EAA Chapter 1000 web site...*)

Talk About Your Dissimilar Formations!

Hey Erbman,

Just checking in. Saw the pics of the Bearhawk wings and looks like you're making progress. Good work!

Unfortunately, my computer has gone through some serious maintenance to include the complete wiping of the C:\ drive and a complete reinstallation of 98 SE and all the software. After fixing some crashes, I reinstalled again. @#&\$^ Microsoft! The good thing is that I have a new Dell 600 MHz on order so I get to do that home networking with the old HP 133.

I'm not sure who's dumber, me for flying in 50°F ambient, or Ed Dutreaux. He flew over to HMB several weeks ago and I needed some cross-country time so we gassed up and headed for the old Fort Ord (just outside Monterey). Well, the Boredom Fighter cruises at 80, and Ed's RV will barely maintain 80 (and that's with the flaps). So Ed flies down on my wing at 80 MPH with his flaps hanging out for the entire 1 hour flight. Over Santa Cruise beach, we decide to head for the deck so I roll over and head straight down. Being a bi-plane speed buildup is not a big factor, but Ed decides the descent angle just is not going to work. Oh well, good flight to the cafe at OAR, which was closed in prep for a Christmas party, so we went to Watsonville. Mission accomplished.

In other news, if you ever need wine for a function, see Chandelle of Sonoma vinyards. They're located in Glen Ellen and produce a nice chardonnay and cabernets. The catch is that all the wines have different "Spirit of Flight" labels that are illustrated by a variety of aviation artists. Way Cool! You can check these folks out at <http://www.chandellwinery.com> (800-544-8890). By the way, the winery is run by Robert Arnold, grandson of Gen Hap Arnold!

Finally got some nicer pics out over Santa Cruz Mountains. My wife took the shots leaning out the door of a Cub. I think you might even like these.



THE LEADING EDGE



- **Jim Piavis**

EAA Chapter 1000 Det 11
San Carlos/Mountain View CA

News From Down Under

I trust that you are all well and the Bearhawk is progressing well. My project is coming on rather slowly at this time but the engine is due next month as I want to save on the 10% Goods and Services Tax that will be introduced here on June 30th.

In case I did not tell you I have ordered the 6 cylinder Jabiru engine – it looks a real jewel so I hope it goes as well as it looks. It is rated at 120HP max and 107HP continuous and only weighs 74Kg so it should give the Zodiac a good climb rate at least.

I am off the New Zealand in a few weeks for the Warbirds over Wanaka airshow which is held every 2 years so I may be bribed into providing some info for the newsletter if you think it appropriate (*looks like you just volunteered!*). They have just got their Hurricane flying and they have a 'fleet' of Russian Polykarpov I16 and I153 fighters flying so it should be good.

- **Graham Byass**

EAA Chapter 1000 Det 10
Perth, Australia

A Chance To Show Off Your Airplane

(We recently received this request, which we are forwarding to the membership...)

Russ,

I have been asked to assist in locating static displays for the Antelope Valley Hospital Fundraiser--"Gala 2000." Since your organization is representative of the efforts within the valley, I was hoping some of your chapter members might be interested in displaying their aircraft at this event. It is currently scheduled for 10/7 at Northrop Grumman's Site 4 facility.

Particular interest has been shown for the BD-5B, the Berkut, the E Racer, the Long EZ, the Pitts Special and the Varize, specifically because these planes are unique in shape, design and color and would add a festive atmosphere. Of course I'm open to additional suggestions.

I am out of the office tomorrow afternoon until Wednesday morning but would love an opportunity to discuss the possibility of EAA Chapter 1000's participation. This event is somewhat off in the distance and so there are many loose details, but I'd be happy to answer any questions.

I look forward to hearing from you.

Tisha Math

Master Scheduler
BAE SYSTEMS
(661) 824-6471--Office
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TMath@tracor.com

The Q-200 and Why Ya Gotta Built 'em Right

(The following conversation recently went through our e-mail portal. Though specific to the Q-200, it makes the point for a lot of designs as to why you should build it per plan and be very careful about trying to "improve" it. It also shows why you should be skeptical about claims that a design is "fast" or "easy" to build)

I've been reading quite a bit of stuff on the Chapter 1000 website, and I've gotta hand it to you - it's a great source for not only information, but entertainment as well!

I've got a question regarding the Q-200 (Brian Martinez). Has anyone encountered the following? (this is an excerpt from an e-mail conversation)

I was wondering if you could help this little email along to find it's way to Brian or other Q-200 pilots who might know something more about it?

-----snip-----

However, during the semester that the class investigated the Quickie, we determined, through anecdotal evidence given to us from builders and flyers as well as computational work done by other people, that the Quickie Q-200 does have some static balance "issues". It seems that the growth of the fuselage to accommodate the extra person over the original quickie design introduced additional lift forces that compromised the balance and trim of the quickie.

We have been told by a builder/flyer that the forward wing carries a larger than desired fraction of the total lift, thus making the plane prone to stall at low speeds, such as during landings. This was also predicted by a computational study which analyzed the lift distribution over the fuselage and determined that a strong nose-down pitching moment was being introduced by the canopy, thus requiring the forward wing to perform at a higher coefficient of lift. This obviously has detrimental effects on balance and can promote early stall.

Our tentative conclusion is that it might be possible to alleviate some of these problems by a redesign of the canopy so that it does not generate as much lift.

-----snip-----

Thanks!

- David C. Troup

Dave:

I think that after more complete analysis you will find that the anecdotal evidence which you cite is colored by builder differences, the relative size of the aircraft in question, and the lack of effective trimming devices incorporated into the plans built design. In short, you have a prototype aircraft which was issued to production with few of the idiosyncracies completely worked out. The original Vari-eze and may other unconventional aircraft have discrepancies about their handling and behavior. Many require different pilot techniques and varying degrees of compensation. The Q-200 is a first generation composite kit aircraft. It tends to have somewhat positive static stability when properly loaded and balanced (i.e., that is spanwise as well as fore and aft). Dynamically, it is more neutral. All this is quite a bit different than a Cessna 150! The Q-200 is not a kite and definitely not a barn door.

This aircraft when built to the original specifications handles wonderfully up and away. The original flight reports were accurate, but incomplete. When cleaned up it is extremely fast for an aircraft using approximately 94 HP out of a O-200 Cont. at 2750 RPM. When you balance the engine and over rev it the aircraft will water your eyes. There are only a few Q-200 aircraft that will do this, however. Most of the Q-200 aircraft built were built poorly and they perform poorly when compared with the prototype. This is an aircraft which was sold as being easy to build (i.e., on the cover of Popular Science). It is not a trivial aircraft to execute properly. The canard (actually forward wing) and main wing must be aligned in incidence to less than a half degree and most of the Q-200s out there are not. Positioning of the wings is critical to good ground performance, but there never were any proper jigging templates devised to accompany the construction of this aircraft. The aircraft needed a better tail wheel and precise alignment of the outboard main gear with differential braking in order to properly track. I started from pilot handling qualities reports and redesigned my gear to work! My Q-200 tail dragger is not too much different than a Cessna when on the ground; you should see how bad some of the other aircraft are...The system, however, can be made to work. I am an aerospace engineer, however, and most people who have tried this design are not!

This is not a canard aircraft. This is a flying wing biplane (i.e., having no horizontal tail). The front wing was designed to take about 60% of the load distribution, however, incidence problems and problems with flying surface placement make the design loading problematic. Leakage of air through control surface gaps can contribute to performance degradation. There are numerous places which can contribute to interference drag totals. The biggest speed problem, however, is an insufficient definition of what is necessary to reduce cooling drag. There are very few airplanes which have good cooling drag reduction because there never was a proper plan. I am still edging away at trying to implement plenum cooling. The prototype/demonstrator Q-200 was an amazing aircraft.

The guys who designed it were going in the right direction, they just never fully developed it.

Finally, this is a point design aircraft. It was originally designed for maximum fuel economy and it succeeded. As a practicing flight test engineer, I recognize that most aircraft allow for off design performance by using variable geometry lift and drag devices. This [Q-200] aircraft has none of them. Belly boards on the Q-200 were an after thought and Quickie Aircraft did not come up with the concept. The reflexer was also a fix that Quickie had to adopt, but they didn't invent it. It was a builder who couldn't get his incidences right. The aircraft is so small that not having that extra person next to you causes the aircraft to roll to the left when at power settings...but, you see, there was no plan for aileron trim. If I had known what I know now...I would have designed and installed such a system (by the way, I've got to do that). Don't get led astray by what you think your analysis says and try to validate based upon builders who can't even spell CFD. This is a workable design, but it is difficult to execute and frustrated builder/flyers are fishing for any excuse to damn the aircraft. Most of us just couldn't build it right with what we got. If you want to study something, look at the influence of builder variation and experience on success or failure of the design. Look at what the lack of builder support can do. Look at the effect of poor configuration management on handling qualities.

I've flown three different [Q-200] aircraft including my own. They fly fine...mine handles better on the ground. You can try to experiment with the canopy all you want; but A WELL BUILT Q-200 FLIES JUST FINE!

- Brian Martinez

Flight Test Engineer

Web Site Update

Checking the ol' hit counter on 8 Apr 00 showed it standing at **41602** for a hit rate of 41 hits/day.

I finally got a chance to do some updates to the site, mainly posting July through November 1999 newsletters and updating the Calendar of Events.



Just a reminder that the EAA Chapter 1000 Web Site is hosted courtesy of Quantum Networking Solutions, Inc. You can find out more about Qnet at <http://www.qnet.com> or at 661-538-2028.

Chapter 1000 Calendar

Apr 15: Young Eagles Rally and Tax Day Celebration, Rosamond Skypark, 661-822-0462

Apr 18: EAA Chapter 1000 Monthly Meeting, 5:00 p.m., Edwards AFB. USAF Test Pilot School (Bldg 1864), Scobee Auditorium. (661) 609-0942

May 3: EAA Chapter 49 Monthly Meeting, 7:30 p.m., Sunnysdale School. 1233 W. Ave. J-8, Lancaster, CA. (661) 949-7214

May 9: EAA Chapter 1000 Board of Directors Meeting, 5:00 p.m., Edwards AFB. Test Pilot School, MOL Room (661) 609-0942

May13: Young Eagles Rally, Fox Field, Lancaster, 661-822-0462

May 16: EAA Chapter 1000 Monthly Meeting, 5:00 p.m., Edwards AFB. USAF Test Pilot School (Bldg 1864), Scobee Auditorium. (661) 609-0942

May 20: Ninth Annual Scotty Horowitz Going Away Fly-In, Rosamond Skypark (L00), Rosamond CA.

Jun 7: EAA Chapter 49 Monthly Meeting, 7:30 p.m., Sunnysdale School. 1233 W. Ave. J-8, Lancaster, CA. (661) 949-7214

Jun 13: EAA Chapter 1000 Board of Directors Meeting, 5:00 p.m., Edwards AFB. Test Pilot School, MOL Room (661) 609-0942

Jun 17: EAA Chapters 1000/49 Young Eagles Rally, Tehachapi CA. (661) 822-0462

Jun 20: EAA Chapter 1000 Monthly Meeting, 5:00 p.m., Edwards AFB. USAF Test Pilot School (Bldg 1864), Scobee Auditorium. (661) 609-0942

For Sale:

Sonerai IIL project. Fuselage and wings 95% complete. Modified for A65 engine. Engine torn down for overhaul but complete with a great many spare engine parts. Includes instruments. Hydraulic brakes. All excellent work. Call Fletch Burns 760-373-3779

To join Chapter 1000, send your name, address, EAA number, and \$20 dues to: EAA Chapter 1000, Doug Dodson, 4431 Knox Ave, Rosamond CA 93560-6428. Membership in National EAA (\$40, 1-800-843-3612) is required.

Contact our officers by e-mail:

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Inputs for the newsletter or any comments can be sent to Russ Erb, 661-258-6335, by e-mail to erbman@compuserve.com

From the Project Police legal section: As you probably suspected, contents of The Leading Edge are the viewpoints of the authors. No claim is made and no liability is assumed, expressed or implied as to the technical accuracy or safety of the material presented. The viewpoints expressed are not necessarily those of Chapter 1000 or the Experimental Aircraft Association. Project Police reports are printed as they are received, with no attempt made to determine if they contain the minimum daily allowance of truth. So there!

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MUROC EAA CHAPTER 1000 NEWSLETTER
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ADDRESS CORRECTION REQUESTED

THIS MONTH'S HIGHLIGHTS:
REGULAR MEETING 18 APRIL AT TPS
BOREDOM FIGHTER PICTURES
COOL NEW WEBSITE
Q-200 DISCUSSION

