

# PLANE TALK

## UPCOMING EVENTS

- **Tuesday, March 22, 2005** - 7 - 9:30 p.m. - Aviation Safety Meeting - Terminal Building Conference Room, Brewster Field, Holdrege, NE
- **Thursday, March 24, 2005** - 7 - 9:30 p.m. - Aviation Safety Meeting - Central Nebraska Aero-motive Hangar - Municipal Airport, Central City, NE
- **Tuesday, March 29, 2005** - 7 - 9:30 p.m. - Aviation Safety Meeting - Silverhawk Aviation, North Hangar, 1751 West Kearney Avenue, Lincoln, NE
- **Wednesday, March 30, 2005** - 7 - 9:30 p.m. - Aviation Safety Meeting - Terminal Building, Municipal Airport, Fremont, NE
- **Thursday, March 31, 2005** - 7 - 9:30 p.m. - Aviation Safety Meeting - Municipal Airport, Hebron, NE

[www.faasafety.gov](http://www.faasafety.gov)

FAA, Flight Standards District Office  
 3431 Aviation Road, Suite 120,  
 Lincoln, NE 68524, 402 475-1738, FAX 402 458-7841  
<http://www.faa.gov/fsdo/lincoln>  
 For Safety Meeting Info-[www.faasafety.gov](http://www.faasafety.gov)

## CHARLES HANNER—LOCAL, REGIONAL & NATIONAL AVIONICS TECHNICIAN OF THE YEAR



The General Aviation Awards Program is a cooperative effort between the Federal Aviation Administration (FAA) and aviation industry sponsors to annually recognize outstanding individuals in the fields of Avionics, Aircraft Maintenance, Flight Instruction, and Counseling.

The awards highlight the important roles these individuals play in promoting aviation safety, education and professionalism. The winners will be recognized locally, regionally and nationally. The winner will receive gifts and merchandise provided by sponsors and contributors.

The award is preceded by an eligibility requirement and application/nomination package that details the candidate's accomplishments. A review and selection process then chooses the best qualified candidate for a particular award.

The FAA Lincoln Flight Standards District Office (FSDO) and the FAA Central Region Office are extremely proud to announce that the 2005 Avionics Technician of the Year is Mr. Charles Hanner. Mr. Hanner is a 14-year employee of Duncan Aviation, Inc., a certificated repair station located in Lincoln, Nebraska, where he works as a Team Leader in the Avionics Department line service area.

Mr. Hanner's dedication to accomplishing any task presented to him has been recognized by his supervisors, his peers and by the many customers who have taken time to write Duncan Aviation about their experience with Mr. Hanner.

Mr. Hanner was recognized for his accomplishments at the recent Nebraska Aviation Maintenance Seminar and was presented the local and regional awards by Lincoln FSDO Manager Diana Frohn. (see picture)

In late February, the FAA announced the national winners in the four categories and Mr. Charles Hanner was selected to be the 2005 National Avionics Technician of the Year. Mr. Hanner will be recognized at EAA's 2005 AirVenture in July at Oshkosh, Wisconsin, where FAA Administrator Blakey will present the award.

Congratulations to Mr. Hanner on his past accomplishments in the cause of aviation safety. Well Done !!!

### Inside this issue:

2005 Nebraska Aviation Conference and Maintenance Seminar	2
Change of Address, FAA Aviation News and Security	2
Wings Program Participants	2
Aviation Maintenance Technician Awards	3
Reliving the Customer Service Initiative	4
Propeller Balance	5
The Little Green Book	6
Incidents & Accidents	7

## 2005 NEBRASKA AVIATION CONFERENCE AND MAINTENANCE SEMINAR



The 2005 calendar year started off with the 13<sup>th</sup> Annual Nebraska Aviation Conference and the 34<sup>th</sup> Annual Nebraska Aviation Maintenance Seminar. The conference and seminar were held January 26 – 29, 2005, at the Holiday Inn, Kearney, Nebraska.

A Wednesday evening aviation safety seminar for pilots led the programs followed by the Nebraska Aviation Conference on Thursday. The conference consisted of general and breakout sessions with guest speakers involving the military, avionics issues, environmental issues, airspace and towers, airport officials, and Designated Pilot Exam-

ers. A group of exhibitors representing the various aspects of airport engineering and maintenance were in attendance.

The Federal Aviation Administration (FAA) presented an overview of the Sport Pilot/Light Sport Aircraft certification rules that are now in place.

The Transportation Security Administration (TSA) discussed security rules and issues with pilots.

An evening banquet consisted of dinner followed by recognition of the 2005 Nebraska

*(Continued on Page 8)*

### FAA AVIATION NEWS

For more FAA information, you can subscribe to the **FAA AVIATION NEWS** magazine by calling the Government Printing Office (GPO) at (202) 512-1800. GPO's code for the magazine is FAN. You can also call the FSDO, (402) 475-1738, and ask for a copy of the magazine and use the subscription form included in the magazine. We only get a few extra copies of the magazine for each edition, but we will put your name on a waiting list and send you one when we get it. Cost of the magazine is \$21.00 per year.

### SECURITY

As we reported in our last newsletter, because of increased security at FAA offices, we must keep our office locked; therefore, no one will be allowed in the office without an appointment. **Also, when entering our facility, you may not have any items in your possession that are not fully exposed and easily viewed. Briefcases, purses and backpacks are not allowed. REMEMBER: PLEASE CALL FOR AN APPOINTMENT. BEFORE YOU MAKE A TRIP TO OUR OFFICE.**

## WINGS PROGRAM PARTICIPANTS

Congratulations to the following pilots for having successfully participated in the Pilot Proficiency Award (WINGS) Program:



**PHASE I:** Roger Anderson, Norm Fuhrmeister, Kent J. Grosshans, Craig McGee, James D. Morrow, Faisal Mufti, Clifton E. Nichols, John Pineda, George Shadbolt, Roy P. Trevisan

**PHASE II:** Dennis Child, Leo Frede, Lonnie Liss, Daniel L. Petersen, Thomas J. Stronik

**PHASE III:** Paul Charbonneau, John A. Denton, Donald L. Glassgow, Harlon Hain, Craig Harm

**PHASE IV:** John Heida, Amy McNaught, Benjamin Montgomery, Scott Vogler

**PHASE V:** Wilmer D. Brauer, Stephen B. Cox, Brad L. Franks, Paul Koenig

**PHASE VI:** Mark G. Cockson, Charles E. Daubs, K.C. Hehnke, Marvin J. Masten, Jr., John B. Nickell, Charles Paulger, Clark L. Thorsen

**PHASE VII:** Dallas E. Baker, John Bartholomew, Melvin Boeckel, Geary L. Combs, John E. Drap, William J. Greiner, Robert D. Henrichs, Robert F. Johnson, Donald F. Maxfield, David Morris

**PHASE VIII:** Michael A. Kieffer, Barton Kreider, Chuck Stokes

**PHASE XI:** Cathy Luenenborg, Dwayne F. Margritz, James C. Murphy

**PHASE XII:** J.A. Curtiss, Claude Hobson

**PHASE XV:** John T. Rooney

## CHANGE OF ADDRESS

If you change your address or do not want to continue to receive Plane Talk, please let us know so we can change our address listing.

## AVIATION MAINTENANCE TECHNICIAN AWARDS

<b>BRONZE</b>	<b>SILVER</b>	<b>GOLD</b>	<b>RUBY</b>
Kim Wallace	Roger W. Schmidt	Joel Heiserman	Jeff Davis
Ted Fritsch	Glen Ruby	Brian Jackson	Tim Shrum
Dennis W. Clark	Wayne K. Jensen	Adam Reasoner	George Smith III
Robert C. Hanson	Steve Alder	Mark Whitney	Timothy Bahensky
Michael J. Lucht	Thomas Bennett	Craig D. Elvers	Andrew Bajc
Jeff Miller	Michael Bernholtz	Rick Konyek	Mark Ballinger
Ron Selken	Lance Boatwright	Drew D. Oetjen	Scott Bart
Adam W. Shelburg	Craig Caskey	David Hagglund	Steven Becker
Jason Thurman	Mike Chick	Frank E. Borsh	William Beller
Sean Davenport	Robert Cline	Mark Adams	Andrew Berg
Brent Elliott	Jim Covert	Jerry Bremer	David Bogart
Michael Essink	Steven Craig	James A. Brockman	Philip Bohaty
Brent Fischer	Chad Doehring	Barry Burkey	Brad Corso
Nathan Godwin	Jeffrey Fleischman	Tim Divis	Harry Dipple
Michael Hergenreder	Terry Fransen	Andrew Dunlap	Todd Fauver
Richard Kempston	Mark Goertzen	Charles Eighmy	Darwin Godemann
Duane Knight	James Hyde	Ron Grose	Scott Henning
David Lewis	Alex Jozsa	Richard Hyde	James Hood
Raymond McGinn	Marvin Kadavy	Steven Joe	Rick Kennell
Joseph Moritz	Scotty Long	Craig Kingery	Jeffrey King
Scott Samuelson	Cary Loubert	Patrick D. Kirwan	Fred Kost
Jeffrey Smith	Kevin Miesbach	James Kuhl	Steve Krings
William Walker	Galen Miller	Brian Pierce	Chad Ladwig
Fred Houston	Daniel Moody	Ryan Staggs	Timothy McClellan
	Kenneth Norseen	Robert Tooker	Daniel McKenzie
	Darrel Otkin	James Vamosi	Michael Mertens
	David Schiver	Christopher Wolf	Nhat Nguyen
	Stanley Schwarzkopf	Michael Zimbelman	Eric Olson
	Timothy Wingert	Scott A. Wagner	William Prier
		William A. Smith	Stanley Prochaska
		Terry P. Brewer	Dudley Reis
		Kenneth L. Bolton	Wendell Roth
			Aaron Spulak
			Allen Sward
			Richard Veik
			Jim Weverka
			Larry Wolterman
			Clay Woodka
			Cody C. Mason
			John R. Ferretti
			Robert M. Griffith





## RELIVING THE CUSTOMER SERVICE INITIATIVE

Earlier in 2004, every certificate holder in every FAA district received a visit from the local FSDO to promote the Customer Service Initiative (CSI—not the TV show). This briefing was one way FAA Headquarters could promote the program as well as put the word out on the streets to inform FAA customers of their rights when dealing with the FAA and of the expectations for both FAA employees and its customers. I am not insinuating that there are issues that currently require this program to be used, however, I do believe that knowledge is power—and the more each of us knows about the CSI process, the less likely it will be needed to resolve issues between the FAA and certificate holders or the public.

First, let's recap the purpose for the program and where the information can be found. The Associate Administrator for Aviation Safety (AVS), Nick Sabatini, believes that good customer service equals good business practices. The purpose of the initiative is to provide a means for customers to ask for a review of an inspector's decision made in the regulatory or certification process without fear of retribution—this is your **right**. If the FAA is, in fact, employing good business practices, then explaining our decisions—**and putting those decisions in writing**—shouldn't pose much of a problem. The CSI process information can be found on the FAA web site at:

<http://www.faa.gov/avr/customerservice/index.cfm>

When you go to the site, you will notice the CSI process is broken down into three areas:

- The CSI Fact Sheet which explains the fundamentals of the initiative;

- The CSI Principles which explains what the FAA and customer expectations; and

- The CSI Marketing Tools that consist of posters, wallet-sized cards, and pocket cards that detail the CSI requirements.

These are all the tools you will need to become familiar with the CSI process and initiate the process should you feel a need to do so. This web site also provides the guiding principles that are necessary for you and the FAA to peacefully coexist anywhere in the nation. The CSI Principles are nothing more than what you can expect from us, but also, what we ask of each person that does business with the FAA—a common sense ap-

proach to communication and resolution of a problem.

The Flight Standards Service (AFS) Director, James Ballough, has initiated **CSI: Flight Standards** that takes the CSI initiative a few steps further by identifying specific goals of the process. These include—

- Promoting more consistency and fairness in applying FAA regulations;

- Promoting earlier resolution of disagreements;

- Better documentation of our decisions; and

- Making every Flight Standards employee accountable for achieving the Service's mission.

These goals are outlined in *Operator's Guide to the AVR Customer Service Initiative* that is available for review and download at:

<http://www.faa.gov/avr/afs/csi/opguide.doc>

This document also includes detailed instructions for FAA certificate holders to begin the process starting at the lowest review level in the FAA "chain of command;" most of the time this will begin with your assigned principal inspector and then his or her immediate supervisor. The guide provides the steps that need to be taken by both parties before proceeding to the next level. The bottom line for the ultimate success of this process requires commitment not only from our employees but from our customers as well. It will only work when both sides of an issue react professionally and in partnership.

I am committed to the CSI process. The Lincoln FSDO is committed to the CSI process. We will work with every FAA customer to provide a fair interpretation of the regulations. Our decisions will be based on regulatory requirements and FAA policy and guidance from FAA Headquarters. If you disagree with a decision we have made, we will gladly provide a detailed explanation of our decision in writing that is void of opinions or personal preferences. *CSI: Flight Standards* is a two-way street, we look forward to taking the journey with you.

Diana Frohn, Manager

**Remember—The FAA's first priority is SAFETY!**

## PROPELLER BALANCE

The major/minor alteration conflict is alive and well across the prairie. The latest installment concerns dynamic balancing of propellers... again. We've been down this road more times than I care to remember over the past 15 years.

### **QUESTION 1: Is performing a dynamic propeller balance considered a major alteration?**

The consensus among technical personnel supports the position that dynamic propeller balancing is a minor alteration to the airframe. Unfortunately, the FAA does not often regulate through "COMMON conSENSEUs". Dynamic balance is certainly no exception. Recent inquiries to the Engine and Propeller Directorate fell upon sympathetic ears; however, I didn't receive the answer most of us were looking for. Officially, the FAA continues to consider dynamic balancing of the propeller to be a Major Alteration to the Airframe. I've also learned that nothing is on the table to amend this interpretation.

Let's look at some critical issues. First, let's examine the technical conflicts associated with dynamic balance. A number of aircraft manufacturers, engine manufacturers, propeller manufacturers, and propeller balance equipment manufacturers have issued guidance regarding dynamic balance. Wouldn't it be swell if they all agreed!

Secondly, FSDO's across the country have also applied their unique interpretation to the major/minor debate. Wouldn't it be swell if we all agreed!

With that being said, the LNK FSDO recommends that you continue to issue a 337 concerning each dynamic propeller balance you perform. Stay with me... there's still more you need to know. As far as the required information in Block 8, you will need to reference the approved data that you utilized to perform the balance. Usually this entry will reference compliance with one of the following FAA Approved documents:

"ACES Systems Guide to Propeller Balancing", Publication Number 1000-OM-01, Revision 2.0, dated June 1996, FAA Approved on October 8, 1996.

"The Smooth Propeller", Chadwick Helmuth Publication Number AW-9511-2, Revision Jun 90, FAA Approved on June 12, 1990.

When the ACES and Chadwick procedures are used, you are required to affix a placard on the propeller to provide notification that the propeller has been dynamically balanced and apply an index marking on the propeller. Your logbook entry should include the final balance information in Inches Per Second (IPS) and location of the mass trim weights (in degrees) from the engine index mark.

The ACES manual provides an excellent guide to dynamically balancing propellers, and may be referenced when using test equipment from another manufacturer. Other sources of dynamic balance information include:

The aircraft maintenance manual

Propeller maintenance manual

McCauley Service Letter 1989-4D, dated July 20, 2001

Hartzell Standard Practices Manual 202A – Volume 11, Chapter 2, Static and Dynamic Balance, dated December 2004

FAA Advisory Circular 20-37D, dated August 15, 1989.

### **QUESTION 2: Is there a maximum weight defined for dynamic balance?**

I was able to find a couple of sources of information regarding the maximum dynamic balance weight per propeller. The ACES Systems Guide to Propeller Balancing, 1000-OM-01, references a maximum moment of 200 gram inches per bolt, with a maximum total moment of 400 gram inches per propeller when attached to the propeller spinner. When the dynamic weight is attached to the propeller bulkhead, the weight is restricted to 90 inch grams per bolt with a maximum weight of 180 inch grams for the propeller.

The Hartzell Smooth Propeller publication references maximum moments of 350 inch grams and 400 inch grams, depending upon the type of balance weight mounting screw used in the particular application.

Oddly enough, I wasn't able to obtain much information from McCauley or Hartzell. McCauley Service Letter 1989-4D, Dynamic Balance and Vibration Troubleshooting of McCauley Constant Speed and Turbine Propellers, dated 7/20/2001, does not provide a maximum limitation for dynamic balance weights.

*(Continued on Page 6)*



## PROPELLER BALANCE

(Continued from Page 6)

Likewise, the Hartzell Standard Practices Manual 202A, Revised August 2004, does not address a total moment for propeller dynamic balancing. However, this document does reference a maximum weight per location of 9.0 ounces.

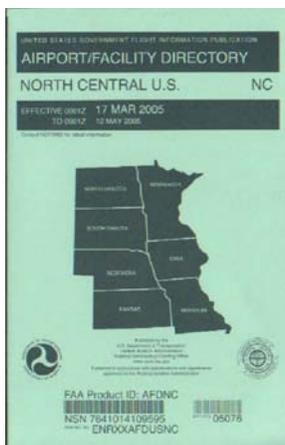
**QUESTION 3: Is there a maximum number of holes allowed in the propeller bulkhead?**

I could find no general reference concerning a maximum number of balance weight hole locations in a propeller bulkhead. However, there is quite a bit of information concerning these mounting holes in the propeller manufacturers' manuals. Some manufacturers' are even beginning to provide pre-drilled holes on the bulkhead.

Look at the bright side... at least we don't have to deal with field approvals!!!

Rick Johnson, ASI

## THE LITTLE GREEN BOOK



“Each pilot in command shall, before beginning a flight, become familiar with all available information concerning that flight.” This quote from Federal Aviation Regulation 91.103 can seem like an impossible and daunting task for a pilot to accomplish. One such publication from the FAA that can help the pilot in reaching this goal is the [Airport/Facility Directory](#) or A/FD.

The A/FD is a seven volume set published every 56 days. It contains a wealth of information for both the VFR and IFR pilot and it is designed to be used in conjunction with other FAA publications. There are other commercially available publications such as AOPA's [Airports USA](#) and [Flight Guide](#). These are fine publications but [Airports USA](#) is only issued to AOPA members once every two years, and to receive [Flight Guide](#), you must have a subscription service. Also, both might not contain the information you need that is provided in the A/FD.

Pilots are more familiar with using the A/FD for specific airport information. In each volume airports are listed alphabetically by state. For each airport, pilots can find information on airport runway lighting (configuration and if it is pilot controlled), runway length and width, runway surface (paved or turf), and runway weight bearing capacity. Traffic pattern information is included. Here you will find traffic pattern altitudes, not all traffic patterns are 1,000 feet AGL, and if the traffic pattern is a right hand pattern for a particular runway. The A/FD will also give you a heads up if there are any obstacles to any runway. It is better to find out this information in the comfort of the flight-planning lounge than on short final. The A/FD will detail FBO information such as hours of operation, phone numbers, and types of fuel and services available.

Most airports have a small airport diagram to the right of the airport information. Selected towered airports have a larger and more detailed airport diagram in the back of the A/FD. Runway incursions have been a focus for the FAA lately and these diagrams should help the pilot find their way around an airport. Be sure to review the airport diagram before flying into an airport and have it out and readily available while you taxi.

In a previous article I wrote on the NOTAM System, I mentioned that NOTAMs you get from Flight Service are those not yet published. You can get these from the published Notices to Airmen, which are published every 28 days, but some are published in the A/FD. Sectional charts are published every six months. When changes to this chart occur, such as frequency changes for airports or when a new tower obstruction is erected, these are kept in NOTAMs for Flight Service distribution until they are published in the A/FD. These notices are in the back of the A/FD under Aeronautical Chart Bulletins. Listed under the specific sectionals you will find obstructions that have been erected with their position in latitude/longitude format and their MSL and AGL height. Here you will also find any airspace changes on any sectionals such as added Class E airspace or airspace dimension changes.

In the back of the book are listed local phone numbers for Flight Service Stations (FSS), Air Route Traffic Control Centers, Flight Standard District Offices, and major Terminal Radar Approach Controls. The FSS phone numbers you will find helpful when you use your cell phone out of your calling area. If you are in Baltimore, MD, and call 1-800-WXBRIEF expecting to talk to Leesburg FSS

(Continued on page 8)

## INCIDENTS

The pilot of a Cessna 172A smelled smoke odor in the cabin. The pilot made a precautionary landing on a dirt road. He discovered the source of the odor was the cabin lighting rheostat assembly. He pulled the fuse and continued his flight to the intended destination without further incident.

The pilot of a Piper PA-31 stated that while attempting to depart, the left engine quit and the right engine was running rough. He taxied back to the fixed base operation. This appears to have been caused by density altitude.

While on approach, the pilot of a CL-600 had a caution spoiler light illuminate. The aircraft already had its thrust reverser deferred prior to this flight. The aircraft landed without incident.

The pilot of a Mason Dragonfly experienced a collapse of the main landing gear during touchdown. The pilot reported a severe downdraft during the landing flare immedi-

ately prior to contact with the runway. The aircraft received damage and the pilot was not injured.

A Cessna 560XL was at cruise altitude when the crew received a low brake pressure/antiskid inop indication and right gear light. The aircraft landed safely and stopped on the runway using the emergency braking system. The mechanics bled the brakes, serviced the gear and pneumatic bottle and performed an operational check of the landing gear. There was no indication of what caused the initial problem.

A student pilot operating a Piper PA-28-140 was practicing touch and go landings. On the first landing he bounced three times. On the fourth touchdown, the nose wheel and yoke separated from the nose wheel strut. The aircraft came to a stop on the runway, skidding on the nose wheel yoke plate. The propeller was damaged. The pilot was not injured.



## ACCIDENTS

An Aeronca 7BCBC sustained substantial damage during a landing rollout on a private strip. The pilot and sole occupant of the aircraft reported gusty wind conditions during the landing rollout on the grass runway. The wind began to lift the left wing. Cross control braking could not prevent the aircraft from nosing over onto its back. There were no injuries.

The pilot of a Piper PA-23 stated that the right engine quit on climb from takeoff. He attempted to land on the highway. The aircraft bounced off the highway and nosed into a berm along the ditch. A witness assisted the pilot out of the aircraft. The airplane was destroyed by fire. Investigation did not determine the cause of the engine malfunction due to the damage caused by the fire. The pilot received serious injuries.

During an approach for landing, the pilot of a BEDE 4 lost control and stalled the aircraft. The aircraft was destroyed and the pilot received fatal injuries.

A Tailwind W-8 lost RMP and oil pressure during cruise flight. The pilot landed in a field and the main landing gear collapsed on roll out due to rising terrain. Investigation revealed that the oil hose from the engine to the oil cooler had become disconnected at the oil cooler end and the oil was lost. The aircraft received substantial damage and the pilot was not injured.

The pilot of a Cessna CE-551 was cleared for an approach. The weather at the time was wind 060 degrees at 3 knots, visibility 1 ¼ statute miles in mist, overcast at 500 feet, temperature 8 degrees Celsius and dew point 9 degrees Celsius. The aircraft was not set up properly for an approach into icing conditions. The aircraft has an accumulation of rime ice ¼ inch thick on the leading edges of the booted surfaces. The pilot was not proficient in flying in instrument conditions. The aircraft landed short of the runway. The pilot was not injured and the aircraft received substantial damage.



*IF YOU THINK SAFETY IS TOO COSTLY, TRY AN ACCIDENT!*



FEDERAL AVIATION ADMINISTRATION  
Flight Standards District Office  
3431 Aviation Road  
Suite 120  
Lincoln, NE 68524

EXTRA

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## WE'RE ON THE WEB

[HTTP://WWW.FAA.GOV/FSDO/LINCOLN](http://www.faa.gov/fstdo/lincoln)

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## THE LITTLE GREEN BOOK

*(Continued from page 6)*

and your cell phone is based in Nebraska, you'll get Columbus FSS.

I am sure many of you have heard "land and hold short procedures in effect" (LAHSO) while listening to the ATIS. If you ever wondered how much runway was available to you with a LAHSO instruction, you guessed it; you can find it in the A/FD. I always look this up during preflight so I know if I can comply with this type of instruction before I receive this clearance.

For the IFR pilot, in addition to the already mentioned information, you can find IFR Preferred Routes, VOR receiver checkpoints, and VOT frequencies. Something new to the A/FD is "Q" routes, which are IFR RNAV routes, for direct filing.

You can purchase the A/FD from your local FBO or order it from any of the mail order companies such as Sporty's Pilot Shop. It may also be purchased from the National Aeronautical Charting Office (NACO). You can reach NACO at 1-800-638-8972 or their website [www.naco.faa.gov](http://www.naco.faa.gov).

This is just a brief review of the A/FD. A complete description would be impossible in this short article. When you are relaxing by the fire some night, grab the A/FD and try to get reacquainted with it. You will find it helpful in your future preflight activities in becoming familiar with all of the available information for your flight, thereby, avoiding those unpleasant surprises that so often plague the unprepared pilot.  
Dan Petersen, ASI

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## NEBRASKA AVIATION CONFERENCE AND MAINTENANCE SEMINAR

*(Continued from Page 2)*

Aviation Hall of Fame inductees (William Gasper, Charles O. Petersen, E.J. Sias), presentation of the Nebraska Airport of the Year Award (Central City), and an entertaining presentation by Brig. Gen. R. Stephen Ritchie (Ret.).

For the maintenance seminar, the sessions included aerospace sealants, composite aircraft construction, vibration analysis, human factors, aging aircraft issues, fuel injection

systems, propellers, Pratt & Whitney PT6 engines and FAA regulatory issues. The maintenance seminar also included various exhibitors associated with the aircraft maintenance industry.

An evening banquet included award presentations and "Apollo: A Nuts and Bolts Perspective" by Mr. Paul B. Schlien, a retired NASA engineer.