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North Dakota Aviation Association
and carrying the Official News of the
North Dakota Aeronautics Commission

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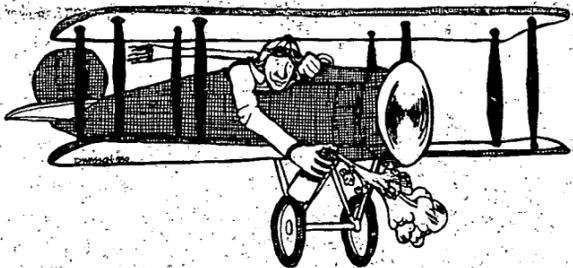
February 1982

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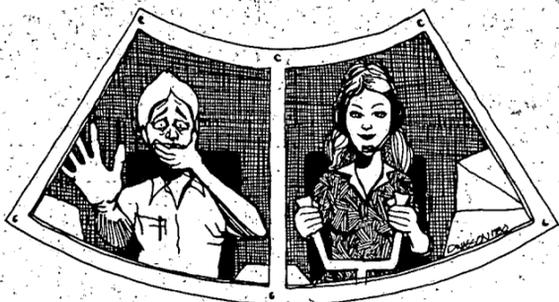
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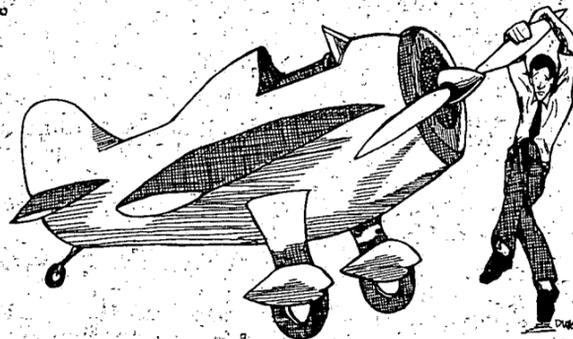
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NDAА to honor "Pappy Larson"

Pioneer of the Year

By JULIE STILLWELL

For as long as Duane Larson can remember, he's wanted to fly. His interest in aviation has never been an idle one, however, and the North Dakota Aviation Association will be honoring Larson with the North Dakota Aviation Pioneer Award in recognition of his contributions to the state's aviation history.

Larson's life has been thoroughly entwined with aviation. Now at age 65, he retired from flying two years ago, and that due to health reasons rather than age.

The Fargo resident was born at Regent, N.D. His uncle Martin Schow of Stanton, N.D., operated a flying school. A 1930 calendar advertising the business hangs as a cherished relic among the awards and photographs lining Larson's family room.

"My uncle used to take me for airplane rides when I was about eight years old," Larson recalled. He finds it difficult to explain why aviation came to be his greatest fascination, but aviation eventually became his career.

Originally, Larson wanted to join the Aviation Air Cadets, but cadets were required to have four years of college—and Larson had not completed that requirement.

Instead, he joined the Army Air Corps in 1941, now known as the U.S. Air Force. He passed the required exam and earned the right to fly.

Larson started out in primary training at Helena, Ark., and took basic training at Gunter Field in Montgomery, Ala. His advanced training took place at Kraig Air Force Base near Selma, Ala.—the same base where his son Tom later trained.

After practice maneuvers at Rice, Calif., Larson was ordered to Fowlmere, England. He served with the Eighth Air Force and completed 68 missions before returning home.

"I've been over Poland, Spain and most of Europe; but I never set foot in any of those countries," Larson commented.

After his four-year enlistment, Larson

operated his own airport at Mott, N.D. Besides the normal activities required in managing an airport, Larson and some friends did barnstorming exhibitions across the western part of the state.

"Once we did a 'How Not To Fly' act. That was one of the few times I had a crash. I busted up the plane, but I walked away without a scratch," Larson recalled with a chuckle.

Crop spraying with airplanes was the newest development in aviation at the time, and Larson said he and his associates "weren't the first, but among the first" in North Dakota to use planes for crop spraying.

Back in the early days of crop spraying, planes were modified to do the spraying.

"Today the planes are custom-made and much safer," Larson noted.

Larson was also granted permission to operate a "G.I. Flying School". He also did occasional charter flying.

Larson was married to Esther Sundby from Turtle Lake, N.D., at age 27, and his wife flew with him often.

"We didn't have a car until I was 30," he said. Their daughter was brought home from the hospital via their airplane.

Larson began his 18-year career with the Air National Guard in 1951 when he was "young enough to be a little wild." An organization he termed a "big morale-booster" was the fliers known as the "Happy Hooligans."

The group of pilots forming the "Happy Hooligans" was named for a comic-strip "Happy Easter and the Hooligans." The Hooligans were well-known in the community for their flying antics and Larson was given the nickname "Pappy," as he was one of

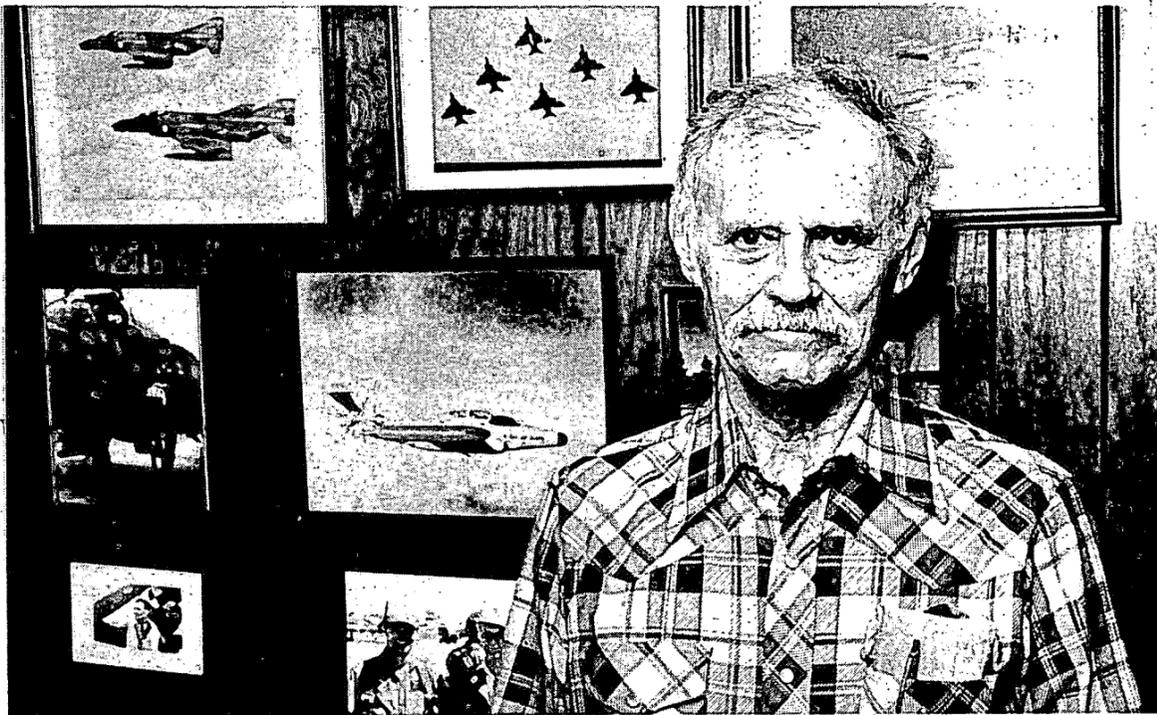
the eldest Hooligans.

Before retiring in 1969, Larson attained Colonel status, receiving the air medal and four clusters, and the Distinguished Flying Cross.

High blood pressure grounded Larson for four years, and he operated a Dairy farm near Eagle Bend, Minn. Four years later, after Larson's health improved, he was given the go-ahead to fly again.

Larson returned to crop spraying and worked for Arlin Kraft, Mapleton, and the Schrader Brothers of Davenport, N.D. He continued until 1980, when his health forced him to retire once more.

Larson has flown several times since retirement, but now as passenger instead of pilot. He continues to enjoy fishing as a recreation, and meets regularly with retired Happy Hooligans to share a breakfast and memories of great flying days.



"Pappy" Larson poses by some of his photographic mementoes.

Attend annual meeting

It's not too late to attend the NDAА annual convention at the Holiday Inn in Dickinson from Jan. 27 to 29.

You can register when you arrive.

Room space is limited though at the Holiday Inn and other motels in Dickinson. Call ahead and make reservations to be on the safe side.

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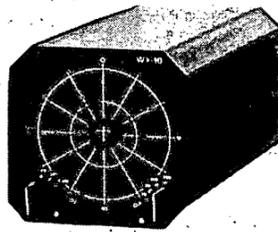
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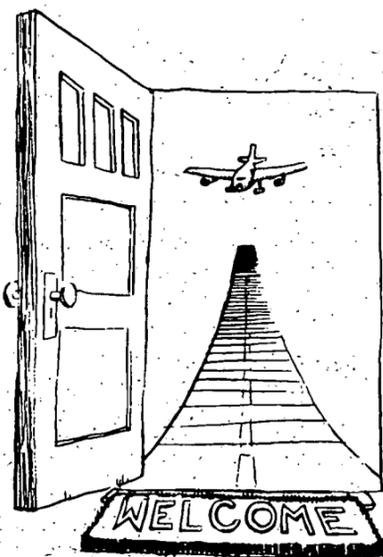
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At This
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1982 NDAA ANNUAL MEETING PROGRAM Jan. 27-29, 1982 Holiday Inn Dickinson, N.D.

(Make your room reservations early . . . space is limited)

Wednesday: Jan. 27

- 12:00 Luncheon
Board of Directors
Members Requested to attend
- 4:00 Registration
- 6:30 Poolside Social Hour
Snacks and Beverages - Dinner on your own

Thursday: Jan. 28

- 7:30 Buffet Breakfast
 - 9:00 First Business Session
Committee Appointments
Approval of Minutes
Treasurer's Report
President's Report
 - 10:30 Coffee Break
 - 11:00 Future of National Agricultural Aviation Association
State Membership
NDAA Past President
Dick Reade, Hayti, MO
 - 12:00 Luncheon-Buffer
Dr. B.J. Cox,
NALCO Chemical Company
Precision Aerial Application and Drift Control
 - 2:00 Economics of the 80's
Futures Planning Panel
Bob Wooster-Federal Reserve
Harold Vavra - NDAC
Other Speakers To Be Announced
 - 7:00 Annual Banquet
Awards Presentation
Pioneer Award
Leadership Award
Past Presidents
Guest Speaker
Lawrence Burian, President
National Air Transportation Assoc.
- NOTE NO DANCE THURSDAY NIGHT

Friday: Jan. 29

- Breakfast on your own
- 9:00 Public Relations-Open Forum
Complaint Report & Handling
Harold Vavra Report
- 10:00 Coffee Break
- 10:30 Safety Report-FAR 135 Review
George MacArthur, Chief Flight Standard Div., Region FAA
Mike Bierenger, FSDO, Fargo
Lee Mills, Chief FSDO, Fargo
Dave Voxland, FSDO, Fargo
- 12:00 Luncheon
Speaker: Jack Daniels
- 1:30 Final Business Session
Convention Report
Membership Report
Committee Reports
Election of Officers

Adjourn

Also attending

Farrell Higbee, editor, World of Agriculture Magazine
Don Holms, NAAA Past President and Mike Clark, NAAA Treasurer.

ND Aviation Association Annual Convention

"Get-there-it-is"

The setting is a Friday afternoon, about 1700 hours, at a southern California airport. The aircraft is a single-engine, four place late model with lots of "goodies" in it for IFR operation.

The pilot, well-qualified in the plane, had worked all week and was looking forward to a weekend in Mexico. The pilot, with passengers aboard, taxied to the runup area after a quick and brief preflight inspection. On a quick engine runup, he noticed the engine would hardly run on one magneto. Naturally, this did not make him happy, BUT HE DID NOT TAKE THE TIME TO HAVE A MECHANIC CHECK IT.

Why?

1. Plans were made.
2. He had to arrive before dark at his destination because the airport was not lighted.

3. He had waited three weeks to make this trip to relax in the Mexican atmosphere. The aircraft was cleared

February 1982

for takeoff. TWO MINUTES LATER the pilot and passengers were dead!!! The next time you have "get-

there-it-is" ask yourself, "Do I really have to go?" "Is it worth it?" If in doubt, don't!

Symptoms of fatigue

The biggest danger of fatigue is that an individual may not recognize its effects. In most situations the symptoms of fatigue are more readily recognized by an observer.

There are several symptoms that you should be familiar with:

1. General irritability, often characterized by a short temper.
2. Low morale and possible loss of motivation, or mild depression.
3. Short-term memory lapses, such as forgetting something you have just been told (radio frequency changes, ATC clearance, etc.)
4. Making simple mistakes, such as tuning in the wrong frequency, misreading a navigation chart, or having difficulty with simple calculations.
5. Timing and accuracy loss.

6. A tendency to accept a wider margin of error than normal, such as not making your normal effort to stay exactly on course or altitude.

What causes fatigue?

There are many causes of fatigue - such as loss of sleep, poor nutrition, noise, boredom, etc.

Disruption of your normal sleeping and eating patterns can upset your "metabolic clock" and induce fatigue. This is a well-documented fact among pilots who frequently cross time zones.

Visual problems and fatigue go hand-in-hand. Eye strain caused by sun glare, variations in light intensity between cockpit and the outside, and an empty visual field commonly contribute to fatigue.

Noise is a major factor in causing pilot fatigue. This is most likely due to

the need for pilots to pay strict attention to radio signals, especially during instrument flight. There is a psychological strain in listening.

Vibration in the frequency range of 18-1500 cycles-per-second has a noticeable fatigue-producing effect. A pilot should make every attempt to reduce vibrations and avoid contact with vibrating surfaces.

Wide variations in temperature and humidity are known causes of fatigue. Usually, the air inside the cockpit is drier than what you are normally used to. Many aircraft heating systems require constant adjustment to keep the cockpit comfortable.

Boredom is another major cause of fatigue. One hour of boredom can consume as fatigue and can cause the inability to react quickly to an emergency situation.

Pilots cannot afford to ignore the symptoms of fatigue, and its many causes, because failure to recognize them may cause an aircraft accident.

Members to look at economy

Members will be looking at the economic future of the aviation business when the North Dakota Aviation Association holds its annual meeting January 27-29 in Dickinson. Changes in federal procedures will be discussed and election of officers will also be held, according to Jack Daniels, Williston, NDAA executive secretary.

Speakers for the event include Lawrence Burian, president of the National Air Transportation Association, Washington; Bob Wooster, a federal reserve board member for the Minneapolis branch; and Dr. B.J. Cox, Nalco Chemical Company, Illinois.

Dr. Cox has been conducting fly-ins across the national analyzing spray patterns with a technique developed at Michigan State University. His speech is expected to provide a look at efficiency and factors related to doing the best

job possible as an aerial sprayer.

A highlight of the annual meeting will be the presentation of special awards to Duane (Pappy) Larson of Fargo, and John Odgaard of Grand Forks, NDAA members. Past president William Beeks of Washburn will also be honored.

The convention will open Wednesday, January 27 with a board of directors noon luncheon at the Dickinson Holiday Inn convention headquarters. NDAA members are invited to attend this opening luncheon. Following the luncheon, an executive meeting will be held at 2 p.m.

Registration opens at 4 p.m. Wednesday followed by a hospitality party for members and guests.

A buffet breakfast will be the first

meeting activity Thursday, January 28. The 7:30 a.m. breakfast will be followed by the first business session.

Dick Reade, a past president of NDAA currently living in Hayti, Missouri, will present a 11 a.m. session on the National Agricultural Aviation Association followed by a question and answer session.

Planning for the economics of the 80's is the subject of an afternoon panel discussion, lead by Wooster. He will be joined by Harold Vavra, Director of the North Dakota Aeronautics Commission. The business and agricultural climate of the state for the coming decade will be addressed.

Burian will also examine the economics future of the aviation community during his speech at the annual banquet. This follows the awards presentation

schedule during the 7 p.m. banquet.

Complaint reporting and handling is the topic of a public relations open forum which opens the meeting Friday, January 29. Glen Johnson of the North Dakota Agriculture Department and Vavra will be the panel members.

Safety and status of air taxi operations will be reviewed during a panel discussion slated for 10:30 a.m. Three members of the flight standards district office in Fargo will be on the panel. These panelists include Chief Lee Mills, Mike Bierenger, and Dave Voxland.

Executive Secretary Jack Daniels, Williston, will be the noon luncheon speaker. The annual meeting will be wrapped up during an afternoon business session, which includes the election of new officers.

State aviation business briefs

Expands service

Dennis Rolfs, President of Executive Air Taxi Corp., Bismarck, announced the acquisition of two new Bell turbo-powered helicopters for commercial air charter or air taxi service from the Bismarck Municipal Airport.

Rolfs said that the helicopters are in addition to a fleet of fixed wing aircraft used for on-demand air taxi service.

Included in the expanded fleet is a 1981 year Bell Model 206L-1 Jet Ranger which carries six passengers and has a top speed of 140 knots (160MPH) and a range of about 450 miles. Also, a 1981 year Bell Model 206B which carries four passengers at a top speed of 110 knots (130MPH) and has a range of about 400 miles.

According to Rolfs, 95 percent of Executive Air Taxi Corp.'s helicopter traffic is energy-related, mostly oil and especially pipeline work, but also some coal business.

Rolfs said that the two helicopters his company operates make several trips per week, going as far as Billings, Montana; Aberdeen, S.D.; and Canada.

Executive Air Taxi Corp., Bismarck has 15 full-time employees, including two helicopter and seven aircraft pilots and three mechanics as well as several part-time pilots.

The larger Bell Jet Ranger can lift 1,500 pounds with a hook attachment. Rolfs added that helicopters can be utilized for air ambulance, police work, fire fighting, emergency evacuation and

utility power line inspections.

Executive Air Taxi Corp., Bismarck, was founded by Dennis Rolfs in 1973. Rolfs is a native of Corona, South Dakota.

Opens air service

Northern Airways Inc., a commercial charter air service, has opened for business in Fargo with Doyle Nordby as director of flight operations.

The Federal Aviation Administration has certified the company to conduct an air taxi and helicopter operation within the United States. Its headquarters are at 2500-9th Ave. S., Fargo, N.D.

Nordby will be the pilot for the charter plane service and Roger J. Johnson will be in charge of the helicopter operations.

Company equipment includes an 8-passenger Cessna Conquest prop-jet and a 3-place Bell helicopter, the latter to be used primarily in the energy industry of western North Dakota and the Williston Basin.

The business will be conducted in cooperation with Executive Aviation Inc. at Hector Airport, Fargo.

Big Sky fares

Big Sky Airlines has substantially reduced round trip passenger fares between Devils Lake and Minneapolis, Minnesota and between Bismarck and Devils Lake effective Monday, December 14th, it was announced by Harold G. Vavra, Director of the State

Aeronautics Commission.

The round trip passenger fare has been reduced on Big Sky Airlines to \$202.00 between Devils Lake and Minneapolis compared with a previous round trip fare of \$250.00, provided that the passenger purchases a round trip on Big Sky Airlines all the way to Minneapolis and return. In the event a passenger books only a one-way fare from Devils Lake to Minneapolis, the fare is \$125.00, which is not reduced.

The round trip passenger fare between Bismarck and Devils Lake has been reduced 50 percent to \$56.00 compared with the previous round trip fare of \$112.00 before the reduction. The reduced Bismarck-Devils Lake fares pertain only to selected flights, which are the early morning flights which leaves Bismarck at 4:55 a.m. and arrive at Devils Lake at 5:35 a.m. and on return flights which leaves Devils Lake at 9:35 p.m. and arrives in Bismarck at 10:15 p.m.

Both reduced fares are conditioned on the passenger buying a round trip ticket. The reduced fares terminate on April 1, 1982, Vavra said.

Eagle rolls off line

The Eagle agricultural aircraft bearing Serial Number 50 rolled off the production line at the Alexandria, Minnesota manufacturing facility during the final days of 1981. The Lycoming IO-540 powered Eagle 300 is equipped with night spray lights, a dry spreader, Automatic Flagman, and air conditioning. Eagle No. 50 is one of fifteen new Eagles in the recently introduced Rent-An-Eagle program.

"1981 has been a milestone year for Eagle Aircraft," Marketing Vice President Wayne Mittleider reports. "We published an aerial application manual to assist Eagle operators in taking full advantage of their equipment. We introduced the industry's first short-term rental program, along with a variety of

lease programs. By meeting the operators' needs with innovative programs, we've also been able to sell everything we've produced and can look forward to 1982 very optimistically."

S-Tec announces

MINERAL WELLS, TX — S-Tec Corporation has announced its new Pitch Stabilization System which is fully TSO'd as an independent flight control device. It offers vertical speed, altitude hold and glideslope couplers as standard equipment.

According to Bob Phillips, Vice President-Marketing, the new S-Tec Pitch Stabilization System is the only product of its kind.

"We have designed this new system to operate completely independent of all other automatic flight control devices," Phillips says. "That way, it can be installed in aircraft already equipped with lateral control — or wing leveler — systems."

Since the new S-Tec system does not directly interface with existing automatic flight control equipment, it does not disturb standing STCs, nor does it require flight control equipment modification.

To attend NDAA

The National Agricultural Association will be well represented at the NDAA convention Jan. 27-29 at the Holiday Inn in Dickinson.

Dick Reade, NDAA past president will speak at 11 a.m. Thursday. Attending and available to speak or field questions will be Ferrell Higbee, editor of the WAA magazine for NAA, Don Holms, a past president and Mike Clark, treasurer. Plan to attend.

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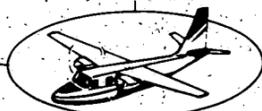
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Economy issue facing NDAA

By Janelle Cole

The biggest issue facing members of the North Dakota Aviation Association is the economy and this makes unity among state aviators more important than ever, says the group's president.

Ron Ehlers of Dickinson, who will leave office after the Aviation Association's annual convention in Dickinson later this month, said that the meeting's agenda reflects the economic situation and its effect on aviators.

While the state association is made up of people from all phases of aviation, the large percentage of the membership is aerial applicators and the economy's effect on them is a good example of problems faced by the industry, Ehlers feels.

"You talk about just the applicators and look at who he affects," he said, citing higher fuel, parts and labor prices that have to be passed on to the farmer who wants crop spraying done.

The ultimate question, he said, is "how much is a grower willing to spend on an acre?"

He estimates that there are six to 10 members of the association who have nothing to do with spraying. Otherwise, "the whole aviation family in North Dakota is dependent on agriculture," he said.

That's why he feels strongly about the need for continued unity.

"What we don't need is a split organization," he said. "There's still power in unity."

This has been demonstrated in the past when issues have arisen and through a united effort by the group, "we've been able to do some good," he said.

Two important components in the association's effectiveness are the lobbyist, Bill Beeks of Washburn, and the

official "complaints" channels to the board of directors.

"Bill has done a fantastic job for us," Ehlers said. "Unity works there. But with a break in that, if you're going to have two organizations in the state with a common problem, you're probably going to have two lobbyists — one

That agency was persuaded to leave the Dickinson FAA flight service station open full time, partly because of the pressure from the association and the commission.

On another issue, Ehlers said that the association's members are lobbying for the proposed MANDAN power line,

so that members' concerns will reach the attention of the executive board, who can then take action. The problem is that few members use this channel.

"How can a board do something if nobody gives them something to do?" Ehlers said. "It's an ongoing problem."

At the same time, he admits that he didn't used to take advantage of the system either.

"I used to sit out in the audience and have all kinds of opinions," he said. "I'm no different than anybody else. Now I'm on the other side of the fence."

He pointed out that while the association board is made up primarily of younger people, older members are still very valuable to the group.

"We need the talents, and brains of the older members. They have been through tough times."

Ehlers, who last August sold his interest in Dickinson Air Service, a fixed-base operation, said this move doesn't really change his outlook on the aviation industry in general or his view of other fixed-base operators in particular.

"Getting out of a fixed-base operation — it has happened to a lot of us," he said. "Some very good friends of mine are still fixed-base operators. I can sympathize with them. I know what they're going through."

Ehlers flies for Rocky Mountain Geophysical now, a seismic exploration company.

He said energy development business kept him and some other area operators afloat during the 1980-81 drought, when agricultural business had dropped to just about nil.

"What kept the business going was air taxi, through the energy we have out here," he said.



Retiring NDSS President Ron Ehlers. (Photo by Janelle Cole)

representing 50 members and another 150 members."

The Aviation Association, working together with the state Aeronautics Commission, has been able to successfully lobby not only the state legislature but other agencies, such as the Federal Aviation Administration,

which would run through the Red River Valley area, to follow section lines.

Ehlers is less pleased with the success of the Aviation Association's official complaints network.

That effort, headed by Vice President Larry Linrud of Wahpeton, is designed

Topics to be covered by Cox

The following topics will be covered by Dr. B.J. Cox, NALCO Chemicals, Ill. when he speaks at the Thursday noon, Jan. 28 NDAA convention at the Holiday Inn in Bismarck.

His outline is as below:

Operation efficiency, pest control and yield is the name of my business.

Drift — what is it and how do I control it?

Precision Spraying — is essential

Efficiency of aircraft compared with ground rigs

The Score Card: Deposition and Coverage — the real application goals; Canopy Penetration — an essential re-

quirement for insect and disease control; Swath Width — important to know for precision spraying; Pattern Evenness — to avoid skips and double coverage; Droplet Sizes and Evaporation — very important to control.

Factors you must consider when you spray fertilizers and pesticides — Weather (Factors to be reckoned with); Temperature, Humidity, and Horizontal and Vertical Air Movements.

Mechanical and Chemical (Applicator controllable) — Aircraft Type, Load, Boom Type, Boom Position, Nozzle Type, Nozzle Position, Nozzle Arrangement, Cores & Swirl Plates, Equipment Calibration, Altitude, Pressure, Aircraft Speed and Spray Solution Stabilizers.

Plan early session

NDAA members are invited to arrive for the meeting early and join the NDAA Board of Directors for a session with a panel on the sales and use tax as it applies to aircraft.

On hand will be Sen. Jack Olin, Dickinson, to discuss various state legislation. Joining him for the sales and use tax discussion will be Walt Stock, State Tax Department, Bismarck and Ben Meier of Jamestown Aviation.

The board convenes in the Holiday Inn at Dickinson, Jan. 27, Wednesday at noon for the luncheon and meeting.

The meeting is slated to start at 2 p.m. and the membership is urged to arrive early and join in the discussion.

February 1982.

Dr. Cox to speak to NDAA

Mr. Ron Ehlers, president NDAA Dickinson, N.D. 58601

Dear Mr. Ehlers:

I have been requested to speak at several state agricultural aviation association meetings on spray drift, deposition and coverage, and want to extend my offer to you should you desire such at any of your future meetings (presentation outline enclosed).

As you may know, I and my colleagues have been conducting fly-ins across the nation, analyzing spray patterns with a technique called a "Copper-Tracer" or "Photometric Test", which was developed at Michigan State University. The system analyzes spray patterns qualitatively for droplet size and also quantitatively for percent of spray reaching the target. Our statistics show aircraft not properly configured may lose 50% or more of the material they spray.

While it is important to get the spray distributed as evenly as possible across the pattern, I also emphasize getting the greatest deposition, and thus, coverage in the target swath as possible. The Copper-Tracer technique is currently the only field test which will quantitatively measure deposition and give you immediate results.

Should you want me to speak at any of your meetings or help you conduct a fly-in, please let me know as far in advance as possible. I will be pleased to help in any way I may be of service.

Sincerely,
Dr. B.J. Cox
Nalco Chemical Company
404 Minnaqua, Prospect Heights, IL 60070

Response: Can you be on hand for the NDAA annual meeting in January?

Answer from Dr. Cox: Yes, I can.

Advice to N.D. aerial sprayers: Attend NDAA convention and hear Dr. Cox speak at the Thursday noon, Jan. 28 luncheon at the Dickinson Holiday Inn.

Safe winter flying reminders

Reprinted from FAA General Aviation News.

Nothing spoils a winter vacation or business trip in your own airplane as completely as a landing mishap at the final destination. You carry out a long, well-planned and well-executed flight in a thoroughly professional manner, impressing friends and family, only to wind up in some ridiculous position with your tail in the air and the ceiling where the floor ought to be. Even if no one is hurt, your pride is pricked and your

wallet is bound to suffer.

Landing accidents tend to increase in the winter, especially in the north or in mountainous areas, whenever the temperature drops down below freezing. The chill factor in landings is something that many pilots ignore when planning winter flights, especially if the weather at their home airport is on the balmy side. If they encounter ice or snow on touchdown they could find the airplane suddenly developing an apparent will of its own as to where this particular trip is going to end.

Putting a ton or more of airplane down on snow or ice, without losing directional control, is no simple matter, even in the absence of crosswind problems. To do it safely you have to develop a sensitive toe for braking plus quick and accurate responses on all the flight controls — not merely the rudder. A light plane skittering over glare ice is as much a challenge to control as any condition you are likely to find in general

aviation flying. Meeting it successfully takes understanding, training, and recurrent practice. It does not come naturally.

During the five winter months of 1977 (November through March) there were 103 landing accidents on snow or icy conditions according to reports of the National Transportation Safety Board. The majority of these accidents were a direct result of the pilot's inability to maintain directional control of the airplane during the landing roll. Equipment failure was rarely involved, although it sometimes seemed so to the pilot. Typically the pilot found his airplane drifting off the centerline on roll-out and attempted to retain control with the use of brakes and rudder only.

The preparation for landing on snow with wheels is similar to landing on wet or muddy fields. Touchdown should be made at the lowest possible airspeed, with a nose-high attitude maintained by power as required. Braking effect may be nil and probably should be avoided altogether until the airplane slows down, since the surface is unpredictable and a sudden catching of the brakes on a bare patch of surface could throw too much pressure on the nose wheel, or pull the plane to one side. Every effort should be made to line up with the centerline before touchdown.

Even at low speeds, braking action on slippery runways requires a very sensitive touch to avoid initiating a skid, and in some conditions any braking or nose-wheel steering, may be non-effective. Rudder action always gives some control, but whenever the wind (including the airflow component from the moving airplane) is more than nine knots, rudder should be used in conjunction with aileron and elevator when taxiing as well as rolling on the runway.

Controlling an airplane on an icy or snowy surface is much like handling a plane on water or on skis; the controls must be manipulated in such a manner as to prevent the wind from turning the plane around on its axis or raising a

wing or the tail. In general the technique consists of raising the upwind aileron, together with opposite rudder and back pressure on the wheel — whenever the wind component is in a forward quadrant. This prevents the wind from lightening wheel pressure on the upwind side and from pushing the tail around or up in the air.

With a quartering wind, the upwind aileron is deflected down to avoid raising the wing; the rudder is coordinated and the elevator depressed. Note that with the wind abeam, the controls are manipulated as they would be with a headwind component, since the forward motion of the airplane will produce this effect. The pilot must be alert to sudden wind shifts, and remember to adjust controls appropriately after turning onto or off a taxiway.

Apart from insufficient skill, the main type of pilot error involved with icy runway landings appears to be lack of preparation. Many of the winter accidents were due to the pilot's dearth of knowledge of landing conditions at his destination airport. Often the pilot had decided to save himself the expense of a telephone to an uncontrolled airport, expecting to be able to assess field conditions from the air. But snow depth and consistency is not all that perceptible from the air, and if the UNICOM is unattended or non-existent, there is always psychological pressure on the pilot to belittle the hazard and chance the landing. Some of the unpleasant surprises he is likely to encounter are:

- Too much snow.
- Hard crust.
- Locked wheels.
- Underinflated struts.
- Downhill runway.

Accidents of this kind are often not taken seriously because the injury rate is low, but the potential for tragedy is always there. And in any case they are the quickest way to spoil what starts out as the perfect holiday. The tendency to regard skidding on ice as "unavoidable" is a mistake.

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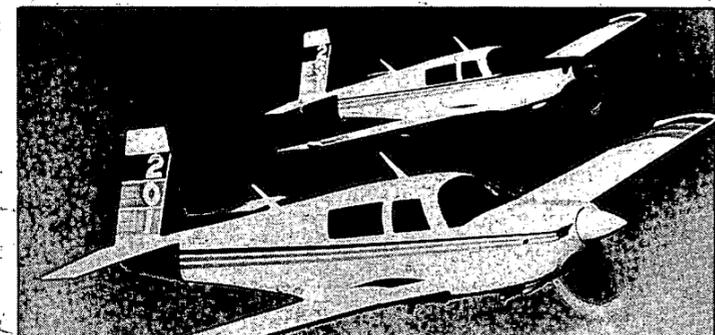
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