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AVIATION NEWSLETTER

STATE HISTORICAL
SOCIETY OF
NORTH DAKOTA

Vernon H. Baltzer, Editor
STATE OF NORTH DAKOTA



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AERONAUTICS COMMISSION
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January - February, 1978

NORTH DAKOTA PROFESSIONAL AVIATION MECHANICS ASSOCIATION ANNUAL SEMINAR
FEBRUARY 28TH THROUGH MARCH 2ND, 1978 - - - - -

Bismarck has been selected as the site for the annual N.D. Aviation Mechanics Seminar and the dates are February 28th through March 2nd, according to Gordon Person of Dakota Aero Tech, Inc., Fargo, the Association President. Person also said that all airplane and powerplant mechanics (A&P's) Inspection Authorization (IA's) and all others interested in aviation mechanics and others, are welcome to attend. The seminar site will be the Kirkwood Motor Inn and everyone is responsible for their own reservations for rooms, Person said. It is suggested that the reservation, phone number 701-258-7700, be made as early as possible.

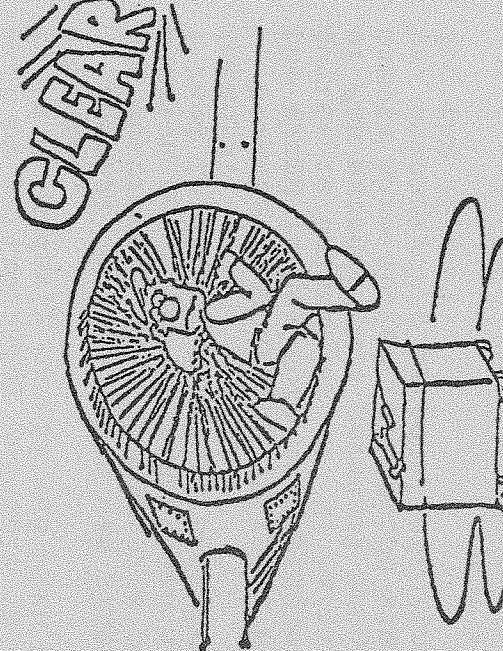
The 3-day meeting which in itself has something for everyone and will conclude with the election of officers for the year and renewal of the inspection authorization ratings. Present officials are Gordon Person, President, Dakota Aero Tech, Inc.; Frank Argenziano, Vice President, Manager and chief mechanic, University of North Dakota Aviation Shop; David Carlson, Secretary, Mechanic, Servair Accessories, Williston and David Teets, Treasurer, owner/operator of Refugee Air Care, Rugby, N.D. The agenda following has been quite well firmed up but is subject to minor changes.

February 28th:

- | | | |
|------------|-------|-------------------------------------------------------------------------|
| 8:00 a.m. | - - - | Registration & Coffee |
| 9:15 a.m. | - - - | Welcome |
| 9:30 a.m. | - - - | To be announced |
| 11:30 a.m. | - - - | Luncheon break |
| 1:00 p.m. | - - - | "What is a 100 hour/annual inspection" - FAA Fargo GADO by Otto Goergen |
| 1:50 p.m. | - - - | Slick Magnetos by Jim Slick |
| 2:50 p.m. | - - - | Coffee break |
| 3:10 p.m. | - - - | "Cherry Rivets" Townsend Division by Charles Kenyon |
| 4:00 p.m. | - - - | "Boots & De-icing Systems" - B.F. Goodrich |
| 4:50 p.m. | - - - | Business meeting - NDPAMA |
| 5:30 p.m. | - - - | Dinner |
| 6:30 p.m. | - - - | Social Hour sponsored by the NDPAMA |

March 1st:

- | | | |
|------------|-------|------------------------------------------------------------|
| 8:30 a.m. | - - - | Champion Spark Plugs by Stan Fletcher |
| 9:20 a.m. | - - - | Coffee break |
| 9:40 a.m. | - - - | "Janitrol" by Bob Deeds |
| 11:30 a.m. | - - - | Luncheon Break |
| 1:00 p.m. | - - - | Continental |
| 2:00 p.m. | - - - | "Teledyne Batteries" by Dick Ruff |
| 2:50 p.m. | - - - | Coffee break |
| 3:05 p.m. | - - - | "Logbooks & Records" by FAA - Wes Edwards |
| 4:00 p.m. | - - - | Engine Components Inc. |
| 5:00 p.m. | - - - | by Rich Worstell |
| | - - - | Social Hour to be announced sponsored by Wall Colmonoy Co. |
| March 2nd: | | |
| 8:30 a.m. | - - - | Avco Lycoming by Kenny Lomiller |
| 9:20 a.m. | - - - | Coffee break |
| 9:30 a.m. | - - - | "Alumigrip Paints" |
| 10:30 a.m. | - - - | Business Meeting |
| 11:30 a.m. | - - - | Election of Officers |
| 1:00 p.m. | - - - | Luncheon Break |
| | - - - | IA meeting with FAA for renewal of IA ratings |



SYNTHETIC OIL*:

Apparently because of the successful synthetic automotive oil in the auto industry, a number of aircraft operators have been asking about the availability of a synthetic aircraft oil. Your Editor was on a panel with a representative of Mobil Oil Company who made the strong statement saying not to use their automotive synthetic oil, or any automotive lubricant in aircraft engines because they have not been approved for use. Over the years we have evaluated engines which used automotive oil and resulted in malfunctioning and failure of the aircraft engines.

Although some of the aviation FAA approved oils are compatible for mixing, not all of them have been tested for it. It is best not to mix brands and weights as a routine where possible to avoid it. There have been a number of instances where mixing of oils brought on a high oil consumption problem, or serious sludging in the oil system. This problem was eliminated by removing the mixed oil and replacing it with an unmixed oil change.

- * - From AVCO Lycoming "Flyer" Issue No. 30.
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P I L O T S - T A K E N O T E:

OVER THE PAST 15 MONTHS, THE AIR FORCE RESCUE COORDINATION CENTER (AFRCC) HAS COMPILED SOME STATISTICS ON OVERDUE AIRCRAFT COMPARING TYPE OF FLIGHT PLAN VS ELAPSED TIME FROM THE LAST KNOWN POSITION (LKP) TO AFRCC NOTIFICATION AND SUBSEQUENT INITIATION OF A SEARCH MISSION. AVERAGE TIME FOR SEARCH FORCES TO LOCATE THE AIRCRAFT ARE ALSO LISTED.

TYPE OF FLIGHT PLAN	NO OF MISSIONS	AVERAGE TIME FROM LKP TO AFRCC NOTIFICATION			AVERAGE TIME FROM LKP TO LOCATION		
		0 HRS	34 MIN	1 HR 8 MIN	3 HRS	43 MIN	27 HRS 24 MIN
I F R	70	0 HRS	34 MIN	1 HR 8 MIN			
V F R	93	3 HRS	43 MIN	27 HRS 24 MIN			
<u>NO FLIGHT PLAN</u>	162	47 HRS	42 MIN	4 DAYS 18 HRS & 22 MIN			

KEEP IN MIND THAT INJURED SURVIVORS OF A CRASH WILL STATISTICALLY DIE WITHIN 24 HOURS IF NOT RESCUED, AND UNINJURED SURVIVORS STATISTICALLY SUCCUMB AFTER 72 HOURS.

* * * * *

NOVEMBER DROPPED AS OCTOBER ENDS

The agency says both pilots and controllers are continuing to use the "November" prefix when transmitting aircraft identification numbers, even though the requirements for doing so was dropped in October.

Pilots are asked to identify aircraft during callups by manufacturer's name and model along with all of the identification number except the N.

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BISMARCK MUNICIPAL AIRPORT RECEIVES ENVIRONMENTAL AWARD

The Bismarck Municipal Airport was selected to receive the 1977 FAA Rocky Mountain Region Environmental Award for air carrier airports because of outstanding efforts and accomplishments towards making it a better neighbor with the community.

These efforts included accomplishment of an airport master plan with an environmental assessment of proposed development on the airport and a land-use plan for adjacent areas of the airport. We believe these efforts will be particularly valuable in assuring that the airport will be developed in an orderly manner and with maximum considerations for environmental concerns.

Special consideration was also given to the city's efforts in resolving controversial problems in a positive manner, acquiring land for expansion and noise abatement and airport traffic patterns which were established to direct aircraft away from populated areas to reduce noise impacts.

Bismarck's Municipal Airport Manager, Raymond W. Heinemeyer, accepted the award in the form of a plaque in behalf of the airport. In a personal letter to Heinemeyer, M. M. Martin, Director of the Rocky Mountain Region of FAA extended his personal congratulations, and to this the North Dakota Aeronautics Commission wishes to add that it was largely through Mr. Heinemeyer's personal efforts and diligent work which won the award for the airport.

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FCC PROPOSAL THAT UNICOMS MONITOR (ELT) EMERGENCY LOCATOR FREQUENCY
OPPOSED BY NORTH DAKOTA AERONAUTICS COMMISSION

In a notice of proposed rule making, the FCC is asking for comments on a proposal to require operators of Unicoms to monitor 121.5 and 243 MHz in order to reduce the number and duration of ELT signals inadvertently activated.

The Air Force Rescue Coordination Center (AFRCC) at Scott Air Force Base, Illinois said that during 1975 they had 6,603 activations. 4,503 were terminated before the source of the signal could be located. Of the remaining 2,100 signals, only 54 or 8/10 of 1% of all ELT signals reported, were activated by a forced landing or a crash. As everyone knows, ELT's are accidentally activated by a number of causes, such as bad batteries causing corrosion of circuits, bad switches, hard landings of the aircraft, through handling during shipment from manufacturer plus human error. Since 90% of all signals are inadvertently activated, the FCC has concluded in its wisdom that to reduce the delay which is being experienced in locating and receiving notification of these signals and since they are mostly on or adjacent to an airport, monitoring by Unicom would solve the problem. FCC also felt that the monitoring requirement would not subject the Unicom licensee to a significant economic burden. Comments were

Harold G. Vavra, Director of the N.D. Aeronautics Commission submitted comments to the proposal and vigorously opposed the requirement that Unicoms monitor the firm's operations on the following grounds:

1. Monitor the ELT frequencies on the following grounds:
 1. Requirement would impose an economic burden on Unicom licensee because it would necessitate the purchase of a monitor costing approximately \$200. or more.
 2. Unicom licensee not a principal of the problem, they the principals being:
 - (a) The Federal Communications Commission
 - (b) The aircraft pilot/owner
 - (c) The ELT Manufacturer.
 3. Legality of mandatory monitoring rule also challenged on the grounds (a) that such a rule is not related to the applicants' need for a Unicom license to operate an advisory radio station, nor any standard or criteria relating to the frequency stability or quality of the signal of the ground station being licensed. In his conclusion, Mr. Vavra stated that in view of the foregoing, problem of inadvertent activation could be greatly reduced by FCC by following steps.
 1. Tighten up type approvals of ELT equipment.
 2. Recall ELT's on market which are known or found to be grossly defective.
 3. Mount a pilot/owner educational program to prevent and check

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AAA TO EXTEND VOR AIRWAY V-170 FROM ABERDEEN TO DEVILS LAKE, ALSO ADD NEW AIRWAY V-344 DUPREE - S D - ABERDEEN - FARGO

The FAA is considering an amendment to Subpart C of Part 71 of the Federal Aviation Regulations (14 CFR Part 71) to alter Federal Airway V-170 and to designate a Federal Airway (V-344) in the vicinity of Aberdeen, S.D. The proposed actions would extend V-170 from over Aberdeen, S. Dak., to Devils Lake, N.Dak., via Aberdeen (352°T/342°M radial) direct to Jamestown, N.Dak., (172°T/162°M radial) and from over Jamestown (353°T/343°M radial) direct to Devils Lake (172°T/161°M radial), and designate V-344 from over Dupree, S. Dak., to Fargo, N.Dak., via Dupree (081°T/068°M radial) direct to Aberdeen, S. Dak., (263°T/253°M radial) and from over Aberdeen (038°/028°M radial) direct to Fargo (219°T/210°M radial). These proposed actions would improve air traffic efficiency by providing continuous pre-preferrential routing with charted radials, distance and minimum en route

THE JOURNAL OF CLIMATE

A LIGHT A INE — END— OF THE UNNEL

AC Form 8050-73 (Aircraft Registration Eligibility Identification and Activity Report) has gone the way of the dinosaurs, as effective the 30th of January, 1978, FAA has decided that it was a burden on the public and no longer needed. The Federal Register VOL-43, No. 20, Monday, Jan. 30, 1978 carried the notice to delete the requirement that each holder of a Certificate of Aircraft Registration must file AC-Form 8050-73 by April 1st of each year. For those of you so inclined to want to read it, you will find it on page 3900 of the Register. If your memory has slipped and you no longer remember the form, its the one wherein you answer questions as to where the aircraft was hangered, how many radios and what type of

Flying and how many hours in the past year. If you neglected to do so and failed to answer followup correspondence, FFAA could and as we understand it, in some instances did revoke the registration number of Your aircraft. Imagine then having to reapply for a N-number and not getting your old one back, which thank goodness will not

CERTIFIED FLIGHT INSTRUCTORS REVALIDATION SEMINAR FEBRUARY 24, 25 & 26 1981

teams for CRI reevaluation programs, and to fill the void. To this end Accelerated Ground Schools Inc. has been engaged to conduct the program and the North Dakota Aviation Association has committed itself to make up any monetary deficit, which could result, if less than fifty instructors attend. The North Dakota Aeronautics Commission will co-sponsor the seminar and it will be hosted by the

The Seminar will be held at the Ramada Inn and classes will be from 8 a.m. to 5 p.m. each day. This seminar is designed for Certified Flight Instructors, flight

CFI Renewal: Successful completion of this course will normally be accepted by FAA GADO office representatives for renewal of your CFI certificate with all ratings. A standardization ride is required if your certificate has expired.

The registration fee is \$60. Food and lodging are additional; however, keep in mind that Treasury regulation 1.162-5 permits an income tax deduction for educational expenses (registration, cost of travel, meals and lodging). Registration is requested at the earliest possible date.

February 24, 25, & 26, 1978

REGISTRATION FORM

Name _____
Address _____
City _____
State _____
Zip _____

Single Room(s)
 Double Room(s)

REGISTRATION FEE: \$60

Box 8216 University Station
Grand Forks, ND 58202

N.D. AVIATION ASSOCIATION ELECT NEW OFFICERS AT MINUTE MEETING

The N.D. Aviation Association elected a new slate of officers at its annual meeting at Minot on January 21, 1978 including Robert D. Wood, Grand Forks, President; Robert Odegaard, Kindred, Vice President; Rick Marburger, Williston, Treasurer and Bill Beeks, Washburn, Secretary.

The Aviation Association adopted a resolution supporting the retention of all present FAA Flight Service Stations in North Dakota including 24 hour - 7 day per week operations of same; voted to jointly sponsor with the N.D. Aeronautics Commission a Flight Instruction revalidation renewal seminar at the University of North Dakota, Feb. 24, 25 and 26, 1978, which will be hosted by UND Department of Aviation.

reporting services.

Larry Ostsy, of Dickinson, suggests that Unicom be used more in making blind radio transmission at uncontrolled airports to prevent mid-air collision. Since this issue of the Newsletter has comments on Unicom's, his suggestion is very timely. The practice of stating your position as you enter the airport traffic pattern, and especially as you proceed into your turns, is a very good practice. If you state your intention to execute a turn, the other pilot has a much greater chance of seeing you as your profile is suddenly much larger and more discernible. Let's make this more of a practice even though we may suspect that no one is listening on the ground, or for that matter, the field may not even have one, if everyone does it the other pilot will be alerted that 2 or more aircraft are attempting to land at the same airport.

ACCIDENTS, FATALITIES, RATES; U.S. GENERAL AVIATION (1967 - 1977)

Year	Accidents		Aircraft- Hrs. Flown (000) c/		Aircraft- Miles Flown (000) c/		Aircraft- Hours Flown (000) c/		Accident Rates Per 100,000 Aircraft- Miles Flown	
	Total	Fatal	Fatalities				Total	Fatal	Total	Fatal
1967	6,115	603	1,229	22,153	3,439,964	27.6	2.72	1.78	0.175	
1968d/	4,968a/	692a/	1,399	24,053	3,700,864	20.6	2.86	1.34	0.186	
1969	4,767	647	1,413b/	25,351	3,926,461	18.8	2.55	1.21	0.164	
1970e/	4,712a/	641a/	1,310	26,030	3,207,127	18.1	2.46	1.47	0.200	
1971	4,648	661	1,355	25,512	3,143,181	18.2	2.59	1.48	0.211	
1972	4,256a/	695a/	1,421b/	26,974	3,317,100	15.8	2.57	1.28	0.209	
1973	4,255a/	723a/	1,412	30,048	3,728,500	14.2	2.40	1.14	0.193	
1974	4,425a/	729a/	1,438	32,475	4,042,700	13.6	2.24	1.04	0.180	
1975	4,237a/	675a/	1,345	34,165	4,238,400	12.4	1.97	1.00	0.159	
1976	4,193	695	1,320	36,128	4,476,014	11.6	1.92	0.94	0.155	
1977P	4,476	693	1,395	38,000	4,619,900	11.8	1.82	0.97	0.150	

a/ Suicide/sabotage accidents included in all computations except rates (1968-3, 1970-1, 1972-3, 1973-2, 1974-2, 1975-2, 1976-4).

b/ Excludes air carrier fatalities (1966-2, 1967-104, 1969-82, 1972-5) when in collision with general aviation aircraft.

c/ Source: FAA

d/ Commencing January 1, 1968, the definition of substantial damage was changed; therefore, fewer accidents were reported. Care should be used in comparing with similar data for prior years.

e/ Beginning in 1970, the decrease in aircraft-miles flown is the result of a change in the FAA standard for estimating miles flown.

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NATIONAL TRANSPORTATION SAFETY BOARD

AIRPORTS AND OPERATORS

Bismarck - Executive Air has taken on the Piper line of aircraft sales, according to Dennis Rohlf, owner/manager, as well as Beech. They have named Henry Brekhus, a North Dakota native, as Sales Manager. The Firm also sells new and used aircraft and has a nice stock to select from. Rohlf said that Executive Air stresses the concept of executive travel, and to that end has assembled a fleet that renders itself to larger groups traveling. He said that to augment the King Air, they also have a nine passenger Navajo Chieftain, plus a second Navajo available, and a Seneca II to round out the line. Five full-time pilots are on the line, and a fully staffed shop, plus student instruction are services offered.

Bismarck - OK Aviation has started footings for a new 100'X 60' heated hangar, but has suspended construction awaiting better weather. Dr. Norbert O'Keefe has sold the firm to a group consisting of Jacobson Construction Co., formerly of Ray, N.D., Dan Delaney, also from Ray, now located in Williston, and Robert Bennet, former Manager of OK Aviation. Lyle Hilden, former Chief Pilot has been named Manager and Chief Pilot. Neil Kelstrom is the Inspection Authorized Chief Mechanic. The firm has two other pilots in Bill Pace and Roger Fucksgruber, and a secretary receptionist, Ruby Ackerman. OK offers Cessna sales and service, A & P shop, and also air taxi/charter and student instruction.

Bismarck - The building formerly occupied by Apollo Aviation has been purchased by the Command Corporation. It will be occupied by Tri-State Engineering, a civil engineering consulting firm, who will be on the second floor. Commander Aviation of Bismarck will move their flight department, plus sales and air taxi/charter offices, now housed in Jacobson Construction building on the northwest edge of the airport, into the remodeled lower floor. Commander will also offer A & P services.

Bottineau - This city has a new fixed-base operator in the person of Mike Pfau, an Upham native. Mike took over from Dick Cole, who moved to Florida to assist his brother-in-law with an operation, and is presently flying a Cessna 421. Mike's operation will be known as "Turtle Mountain Aviation". He will be providing new and used aircraft sales, A & P shop, flight instruction and aerial application. For those of you who haven't been to Bottineau for a spell, a large 75'X 100' shop and office building has been constructed. Pfau holds a Single & Multi-Engine Certificate with Instrument and Certified Flight Instructor ratings. He and his wife, Joette, invite all to stop in and to introduce yourselves and have a cup of coffee. The firm's telephone number is 701-228-3740.

Beulah-Hazen - A series of very fruitful joint meetings have been held between these two highly competitive cities and a planning firm has been hired to make an application to FAA for a planning grant. The H-K-M firm

of Billings, Montana, was hired to find a site acceptable to both cities, and after approval, to proceed with an environmental study and masterplan. Planning grant monies are expected to be available in April of 1978.

Carrington - Paving was completed this fall on a 1200' extension of the NW-SE to the SE according to Frank Buzzell, Authority Chairman. With a paved length of 3850', Buzzell said that three Cessna citations have already used the airport. Buzzell said that although the new paved section has not been lighted, two of the green threshold lights on the SE end of the old length have been removed so as to allow use of the entire length. Light on the new section will be installed as soon as possible next spring, he added. They are also plowing the snow and have kept it open all winter.

Crosby - An overlay has been laid down over the entire length of the NW-SE runway as well as the connecting taxiway and ramp area. Work was accomplished in late summer.

Mandan - Commander Aviation has completely remodeled the large 110' x 80' hangar, as well as building a 20' x 110' addition. The upper portion of the hangar was also remodeled to secure additional space. A total of 15,280 sq. ft. was the net result, according to Ken Reed, President of the firm. Reed said that the building was completely insulated and sheet rocked, and will be heated, as well as air conditioned. The hangar building will accommodate most of the larger corporate twins and will allow avionics work to be completed indoors by a well equipped avionics shop also housed in the building. The shop, named Way-Point Avionics, is run by Larry Buller, and handles the following lines: King, Bendix, Narco, Mitchell, Edo-Aire, Cessna, plus auto-pilots and flight-directors and Weather Vision radar. Reed said that Commander would be handling the complete line of Cessna Aircraft, as well as being a distributor for Weatherly and Ayers Thrush Commander Ag planes. He said that the firm also has the area's largest selection of new and previously owned other make and model aircraft. Reed also said that plans are being formulated for an open house on May 20th and 21st, and that Commander Aviation would be moving their corporate headquarters to Mandan, from the Jacobson building on the Bismarck airport.

Mandan - Land purchases have been completed to allow construction of a new northwest by southeast 4000' runway. Engineering is being completed on the masterplan, as well as plans and specification. The new runway will be moved 400' northeast and be parallel to the existing 2600' runway, which will become a taxiway. Additional connecting taxiways will also be constructed as well as the entrance road paved. Including land purchased, the entire project will cost approximately \$750,000. FAA funding is expected in the first quarter of fiscal year 79, which means October, 1978. Bid will presumably be opened in late summer, and the contract awarded after October 1, 1978, with construction starting early in 1979.

Air Show at Mandan - With the date of Saturday, May 20 and Sunday, May 21st, an air show at Mandan Municipal Airport is one of the first announced dates in the state. A fly-in breakfast is scheduled for Sunday, the 21st. High-lighting the event on both days will be Bob Hoover with his Shrike Commander, also the flying grandfather and renowned distance flyer, Max Conrad, will be on hand.

Commander Aviation has also scheduled their open house to coincide with the event, and will be showing off their new facilities. Many other attractions and events will also be scheduled, and more information will be forthcoming at later dates. * * * * *

TRUST FUND SURPLUS - A BREAKTHROUGH IN THE MAKING

According to the Flight Line Times, a tabloid that claims to put out aviation news while it is news, several aviation groups testified strongly before a House Subcommittee on January 24th that the FAA has not done enough for commuter and reliever airports, and the ADAP law should be changed. The newspaper goes on to say that: "In perhaps the most significant note for general aviation, the Air Line Pilots Association went on record favoring a shift of money from the large hubs to the smaller ALPA-used airports, which though served by air carriers are mostly devoted to general aviation. Webster Todd, former safety board chairman and now representing ALPA, said the large hubs have improved their safety-related facilities and now are going on to 'build terminals and parking lots' while at commuter and reliever airports, such things as instrument landing systems and approach lights can't be bought.

Todd said the available money "ought to go to these smaller airports, not served by air carriers, because a reliever is just as important to the safe and reliable operation of the entire system. We would very much like to see these places improved in order to take the burden off the major hubs."

FAA ROCKY MOUNTAIN REGION GOLDEN SENTINEL TEAM SAFETY SEMINAR SCHEDULE

Michael G. Beiriger, Chief of Fargo GADO Accident Prevention Program has completed the scheduling of the annual appearance of the Golden Sentinel Team here in North Dakota.

Topics covered during the following schedule will be take-off and landing techniques; mechanical problems; aircraft performance; safe pilot techniques and weather flying and accidents.

All meetings are evening meetings starting at 7:30 p.m. and running to 10:00. The schedule follows:

February 14, 1978	- 7:30 p.m.	- - -	Fargo, N.D.	- - Stevens Hall Auditorium NDSU
February 15, 1978	- 7:30 p.m.	- - -	Grand Forks	- - Student Union Ballroom UND
April 3, 1978	- 7:30 p.m.	- - -	Jamestown	- - Ramada Inn Bismarck
April 4, 1978	- 7:30 p.m.	- - -	Bismarck	- - Sidney Lee Auditorium Bismarck Jr. College
April 5, 1978	- 7:30 p.m.	- - -	Minot	- - Ramada Inn
April 6, 1978	- 7:30 p.m.	- - -	Devils Lake	- - Lake Region College Auditorium

LANDINGS AND TAKEOFFS FROM HIGH ELEVATION AIRPORTS*

Pilots frequently ask us for information and guidance concerning landings and takeoffs from high elevation airports. Our reference point in this discussion will be based on density altitude. The discussion also requires that we treat separately operation of normally aspirated, turbocharged, and supercharged engines at high elevation airports.

Normally Aspirated: The normally aspirated engine performs and reacts to density altitude. As an example, this type powerplant at takeoff from an airport with a 3,000 ft. indicated altitude airport, but with an ambient temperature of 85° F., would have a density altitude of more than 5,000 ft. The engine would lack some 20 to 25% of its power and also probably run rough because of a rich mixture on the ground at full rich. Therefore, the typical normally aspirated direct drive engine requires the mixture be leaned on the ground for efficient takeoff performance where airports are 5,000 ft. (density altitude) or higher. The over rich condition is something the pilot can compensate by leaning. However, the higher density altitude with its thinner air cannot be compensated for with a normally aspirated engine unless a supercharger or turbocharger unit is added to the power plant. Thus, at density altitudes of 5,000-6,000 feet, the pilot of a normally aspirated engine has available to him approximately 75% of the engine power, and must plan his takeoff accordingly after setting the mixture.

Procedure for Leaning: (1) The fixed pitch propeller - lean to maximum RPM at full throttle prior to takeoff where airports are 5,000 ft. density altitude or higher. Limit operation at full throttle on the ground to a minimum time.

(2) The direct drive normally aspirated engine with a prop governor but without fuel flow or EGT, set throttle at full power and lean mixture at maximum RPM with smooth operation of the engine as a deciding factor.

(3) With fuel injection, if the powerplant has a marked fuel flow gage, then set mixture in accordance with instructions on the fuel flow gage and/or in accordance with the airplane Pilot's Operating Manual.

(4) With an EGT gage, at full throttle, lean mixture to plus 100° on the rich side of peak of a normally aspirated engine.

(5) Pressure carburetor - All Lycoming engines have an automatic mixture control which does not require leaning for take-off.

(6) Turbocharge and supercharged engines - All takeoffs must be at full rich mixture because the engine is brought back to sea level horsepower which does not permit leaning.

Descent: Regardless of the field elevation where the pilot intends to land, the descent from cruise altitude to traffic pattern altitude should include some leaning for smooth engine operation. Low elevation fields (below 5,000 ft. density altitude) will require that the mixture be moved to full rich in the "before landing checklist". Landing at airports above 5,000 ft. density altitude, the mixture must be leaned to smooth engine operation during traffic pattern flight and landing; otherwise, the engine may stall on the runway because of excessive richness.

* - From AVCO Lycoming "Flyer" Issue No. 30.

SECOND 1977 TAKEOFF WINNER UNSURE OF KEEPING PRIZE

Airplane Given Away by General Aviation Manufacturers' Association

Again from Flight Line Times, who interviewed James A. Flader, 32, a salesman from Rockford, Illinois, who was pronounced the winner in the second drawing, held January 18, of the two held for 1977, said he is now reviewing the cost of keeping a \$50,000 airplane, and from the numbers he was coming up with, it doesn't look feasible. He went on to say that he earns in excess of \$30,000 per year.

IMMEDIATE OPENING: Full time Flight Instructor. Call 701-223-0260 or write P.O. Box 1471, Bismarck, N.D. 58501

FOR SALE: Cessna 150's and 172's including an XP. 1975 through 1977. All one-owner aircraft purchased direct from factory. Must be seen to appreciate their excellent condition. Contact Capitol Aviation Corp., Box 1471, Bismarck, N.D. 58501 or call 701-223-0260.

FOR SALE: 1977 Piper Warrior PA-28-151, new January 1977, 200 TT, clean no damage, will whole-sale, will trade. Contact Servair Accessories, Williston, 701-572-3773
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FOR SALE: 1977 Sundowner C-23, Holiday package; 1977 Sierra C-24R, Professional package; 1973 Bonanza A-36, EGT, @-KX-170 A Nav/Com, KR-85, ADF, KT-76 transponder, KN-65 DME, KR-21 markers, KA-25 Audio AMP; 1977 - Piper Seneca II, 37 TT, De-ice boots, hot props, hot windshield plate, King Nav-com package, King DME, encoding altimeter, Altmatic IIIC; 1973 - Piper Warrior, 1700TT, ALFA 100 Nav/Com, Genave transponder. Contact Executive Air Taxi Corp, Box 2273, Bismarck, N.D. 585051 or 701-258-5024.
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FOR SALE: One way type snow blade 8 ft, complete with undercarriage and one hyd. cylinder. Contact Byron Humann, Hazelton, N.D. 701-782-6851
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FOR SALE: 1976 Cessna 150 Commuter, 1200 TT, Cessna Nav/Com 300, 360 Com, 200 ch. Nav; 1977 Cessna 150 Commuter 460 TT; 1978 Cessna 152 II, 100 TT; 1977 Cessna 172 Skyhawk II, 750 TT, A/F, 350 TT Eng.; 1977 Cessna 172 XP Skyhawk II, 650 TT, Dual Cessna 300 Nav/Com, G/S, Mrk, Bcn, Dual ADF Receivers, Xpander, RNAV, Encoding, Altimeter, Strobes, DME, 400B Auto Pilot, Hot Prop & W/S Anti Ice Electric; 1975 Cessna 210 Centurian II, 1165 TT; 1978 Cessna 182 RG for March Delivery. Contact OK Aviation, Bismarck, N.D. or call 701-258-5610.