

FREEFLIGHT



NOV. DEC. 75

Contents

Freeflight

Issue 7/75 November/December 1975

Official Publication of the Soaring
Association of Canada



Editorial	3
The New Look of a Canadian Built HP-14	4
Ennui	6
Letters to the Editor	7
Rideau Club Host to Air Vice Marshall	8
Club News	10
SAC Directors Meet at Claresholm	10
The BD05S Sailplane	12
The Loser	16
Turns on Tows	20
Hanger Flying	22

Cover Photo by Witold Forester. Willi Deleurant in Motorized Version of HP-14
Graphic Design by Mike Landgraff, Graphic Design Centre.

Directors and Officers

President	Mr. Walter J. Piercy, 184 Churchill Crescent, Kingston, Ontario, K7L 4N2	(613) 546-9937 H (613) 544-6000 B
Past President	Mr. Terence R. Beasley, 173 Leslie Street, Dollard des Ormeaux, P.Q., H9A 1X2	(514) 684-7145 H (514) 744-1511 B Loc. 754
Vice President	Mr. Peter Trounce, 18 Belvaie Avenue, Toronto, Ontario, M8X 2A7	(416) 239-0239 H
Director, Quebec and Maritime Zone	Mr. George W. Couser, 735 Riviere aux Pins, Boucherville, P.Q.	(514) 655-1801 H
Director, Ontario Zone	Mr. Hal Werneburg, Bartlett Road, R.R. #1, Beamsville, Ontario, L0R 1B0	(416) 563-7488 H
Director, Prairie Zone	Dr. Geoffrey P. Anthony, 308 Dromore Avenue, Winnipeg, Manitoba, R3M 0J5	(204) 284-8084 H
Director, Alberta Zone	Capt. Fred J. Becker, Box 2898, Medley, Alberta, T0A 2M0	(403) 594-4385 H
Director, Pacific Zone	Mr. David Parsey, #8 - 636 Clyde Avenue, West Vancouver, B.C.	(604) 921-7137 H (604) 926-4224 B
Director-at-Large	Mr. Walter J. Piercy	
Director-at-Large	Mr. Peter Trounce	
Secretary-Treasurer	Mrs. Terry Tucker, 786 Chapman Blvd., Ottawa, Ontario, K1G 1T9	(613) 733-2165 H (613) 733-2165 B
F.A.I. Awards	Mr. Peter Coleridge, 80 Waverley Street, Ottawa, Ontario, K2P 0V2	(613) 237-2068 H (613) 992-2113 B
Freeflight Editor	Mr. Robert F. Nancarrow, 43 Seal Cove Drive, Etobicoke, Ontario, M9C 2C7	(416) 621-2276 H (416) 252-4656 B

Editorial

Everyone seems so helpful in gliding - there is usually someone to help push to the flight line, hook up and run your wing; someone to tell you where they were getting lift and how much; and someone to tell you how good your landing was, except the ground was three feet too low.

The instructors, long suffering and unpaid, are helpful. The tow pilots, bless them, really do try to drop you in lift. We all try to help our fellow pilots by telling them what to do and how to do it - we also tell them what not to do to help them stay out of trouble.

Why is it then that when accidents occur, we keep them quiet - avoid reporting them (except to collect on the insurance) - and generally try to forget they exist. Sure, nobody likes to admit they goofed, but if the causes of accidents were made known maybe we could avoid some repetitions in the future.

In the past two years about 60% of the clubs reported at the year end to the SAC Safety Committee with only 12 accidents reported in 1973 and 19 in 1974. There were more accidents and incidents involving gliders and tow aircraft than that, but we are not to learn from them because they went unreported. The MoT reports are terse and lack

detail, the insurance reports are considered confidential and the clubs simply don't want the "bad publicity".

How are we to learn from others if they won't share their bad experiences as well as their good ones. We aren't suggesting that individual pilots be held up for ridicule or be embarrassed by a highly detailed account of their moment of supreme stupidity when they bent the club's best single seater. What we do suggest is a realistic, factual, detailed report of each accident or serious incident which could be published for all interested glider pilots to read and hopefully, learn from.

Tentative deadlines for future issues

Issue 1/76 - Jan./Feb. - December 12, 1975
Issue 2/76 - Mar./April - February 12, 1976
Issue 3/76 - May/June - April 16, 1976

Material for future issues of FREEFLIGHT should be mailed to:

Bob Nancarrow
43 Sealcove Drive
Etobicoke, Ontario
M9C 2C7

MOVING ? Send your change of address to:
Mrs. Terry Tucker
786 Chapman Blvd.,
Ottawa, Ontario
K1G 1T9

List of Member Clubs

Quebec & Maritime Zone

Air Cadet League (Que.), 5726 Sherbrooke St. W., Box 340, Montreal, P.Q. H4A 3P6
Appalachein Soaring Club, Box 271, Sherbrooke, P.Q.
Ariadne Soaring Inc., 735 Riviere aux Pins, Boucherville, P.Q. J4B 3A8
Buckingham Gliding Club, c/o J. Bisson, 3020 - 150 Greber Blvd., Gatineau Point, P.Q.
Champlain Soaring Association, 111 Mgr. Tache, Boucherville, P.Q. J4B 2K2
Montreal Soaring Council, Box 1082, Montreal, P.Q. H4L 4W6
Missisquoi Soaring Association, Box 289, Mansonville, P.Q. L0E 1X0
New Brunswick Soaring Association, c/o Dr. A. Dobson, 521 Blythwood Ave., Riverview, N.B.
Quebec Soaring Club, Box 9276, Quebec, P.Q. G1V 4B1

Ontario Zone

Air Cadet League (Ont.), Mr. H. Bruhman, 1107 Avenue Rd., Toronto, Ont. M5N 2E4
Air Sailing Club, Box 2, Etobicoke, Ont. M9C 4V2
Base Borden Soaring Group, c/o 71 Sangro Loop, CFB Borden, Ont. L0M 1C0
Bonnechere Soaring Inc., Box 1081, Deep River, Ont. K0J 1P0
Caledon Gliding Club, R.R. #1, Erin, Ont.
Central Ontario Soaring Association, Box 762, Peterborough, Ont.
Chatham Air Cadet Gliding Club, 561 Lacroix St., Chatham, Ont. N7M 2X1
Erin Soaring Society, Box 523, Erin, Ont. N0B 1T0
Gatineau Gliding Club, Box 883, Station B, Ottawa, Ont. K1P 5P6
Huronia Soaring Association, c/o M. Badoir, 435 Hugel Ave., Midland, Ont. L4R 1V4
Lakewood Gliding Club, Box 161, Station F, Thunder Bay, Ont.
London Soaring Society, Box 773, Station B, London, Ont. N6A 4Y8
Provincial Motorgliding & Soaring Association, R.R. #2, Blackstock, Ont. L0B 1B0
Rideau Gliding Club, c/o H. Janzen, 172 College St., Kingston, Ont. K7L 4L8
SOSA Gliding Club, Box 654, Station Q, Toronto, Ont. M4Y 2N7
Toronto Soaring Club, Box 856, Station F, Toronto, Ont. M4Y 2N7
Windsor Gliding Club, c/o H. Press, 2050 St. Anne, Windsor, Ont. N8N 1V7
York Soaring Association, Box 660, Station Q, Toronto, Ont. M4T 2N5

Prairie Zone

Air Cadet League (Man.), Capt. G. Evans, 364 Duffield St., Winnipeg, Man. R3J 2K2
Air Cadet League (Sask.), Mr. J.J. McDonnell, Box 5099, Regina, Sask. S4P 3M3
Red River Soaring Association, Box 1074, Winnipeg, Man. R3C 2Y4
Winnipeg Gliding Club, Box 1255, Winnipeg, Man. R3C 2Y4

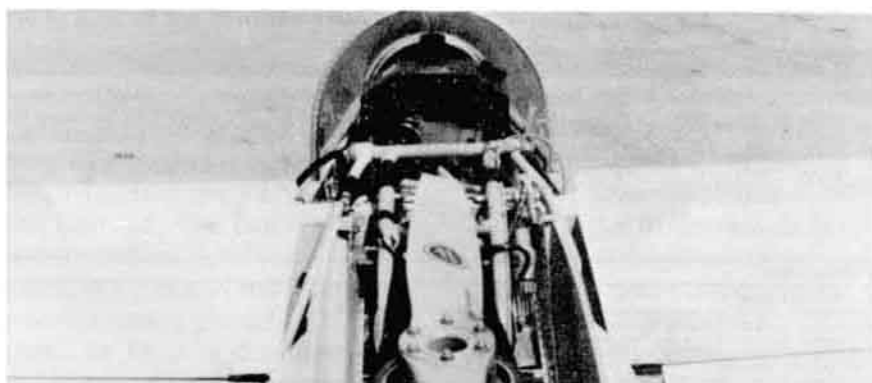
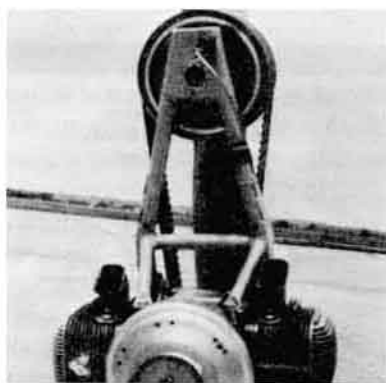
Alberta Zone

Cold Lake Soaring Club, Box 1714, Medley, Alta. T0A 2M0
Cu Nim Gliding Club, Calgary, Alta. T2P 2M6
Edmonton Soaring Club, Box 472, Edmonton, Alta. T5J 2K1
Regina Gliding & Soaring Club, c/o 2117 Grant Rd., Regina, Sask. S4S 5C9

Pacific Zone

Air Cadet League (B.C.), c/o Capt. R. Lacerte, 8908 Glenwood St., Chilliwack, B.C.
Alberni Valley Soaring Association, Box 201, Port Alberni, B.C. V9Y 7M7
Comox Gliding Club, Box 238, Lazo, B.C. V0R 2K0
Okanagan Soaring Club, Box 1135, Kelowna, B.C. V1Y 7P8
Vancouver Soaring Association, Box 3651, Vancouver, B.C. V6B 1Z1
Van Isle Soaring Association, c/o R.J. Hansen, R.R. #2, Courtenay, B.C.
Wide Sky Flying Club, Box 6931, Fort St. John, B.C. V1J 4J1

The New Look of a Canadian Built HP-14



The persistent spirit of a contest pilot has been the primary ingredient in the development of the first Canadian built motorglider.

Willi Deleurant of Toronto Soaring Club has been flying gliders for 45 years. He holds Canada's Diamond Badge #10 and won the National Contest in 1960 and 1965 plus coming second in '61, '68 and '69.

For the past three years Willi's long experience in gliding plus his business background in auto

mechanics have been applied to developing an efficient motorglider adaptation for his HP-14.

The first effort in 1973 was a fuselage mounted engine, folding pylon and geared drive that looked great but wouldn't do the job. The next year was a change to belt drive but still with the inefficient under-powered engine. This season, a new engine with belt drive and a new "Hoffman" propeller are getting Willi off the ground and climbing at 300 fpm.

Finding the materials to fit into the limited space available (16½" x 22") and producing the perform-

ance needed has been half the battle. A friend, George McNair, owner of the Delta Machine Shop in Toronto has been a big help and the dogged persistence Willi used to show in soaring contests has produced a winner again.

Why make a high performance sailplane like the HP-14 into a motorglider? Not to fly under power says Willi; all he wants is the chance to launch himself for soaring flight and avoid the landing out problems. He only uses a one gallon tank which gives him about a half hour of power but this can be



enlarged if needed. Willi's dislike of landing out was increased at the World Contest in Marfa in 1970 when he had a 28 mile walk out of the boondocks. With his hydraulic unfolding mechanism and electric start, he can get under power in seconds when he gets low and avoid retrieves or a long walk for help. The powerplant is a modified OMC snowmobile 32 H.P., two stroke engine; turning up to 6000 rpm. An electric starter is used with a 12 volt 40 amp snowmobile battery housed in the nose for counterbal-



ancing the engine weight. The belt drive at a ratio of 2:1 turns the prop at 3000 rpm.

The movement of the powerplant after opening the doors is accomplished by hydraulic pressure stored in an accumulator, operating a ram type cylinder. To erect or retract the powerplant takes only a couple of seconds and no effort by the pilot; and because of the minimal change in centre of gravity when the engine moves, no change in airspeed is necessary when changing from the gliding to the power mode. The powerplant may be completely removed from the aircraft by unscrewing six bolts and connections

plus removing the battery, thus restoring the glider to a pure sailplane. While the performance of the version shown in the photographs is quite acceptable; Willi is still not satisfied. He is already planning his next adaptation which will be to house the engine within the fuselage retaining the belt drive inside a pylon. This will reduce drag substantially without affecting the present reliability.

Desire, technical skill and continuous effort have brought Willi to his present performance and he says, "Wait til next year . . . it will be even better!"



Ennui

Late fall has always seemed to me to be a sad, moody time of the year. The sun, when it shines, does so with a sort of pale, white light that holds no warmth. The days relentlessly keep getting shorter. The leaves, with their fantastic burst of colour, are gone now, but the now has yet to arrive, leaving the trees bare, grey and deathly.

From the air, the ground appears almost entirely grey or brown; sombre and alien after all the months of greens and golds.

The last stubborn few, who had hoped for just one more flight, sit around and talk for awhile, dutifully finishing the last of the beer. Then they begin to drive off into the dark and the silently settling snow.

The hawks fly to places where the winter is easier and large formations of ducks and geese flap southward.

Our sailplanes, which become so much a part of us, and we a part of them, during the summer, now are folded away in boxes and tight metal "cocoons" until spring.

Every fall we relearn how to light the crazy furnace in our trailer and spend our weekends looking out at the sky and mumbling "maybe it will lift" until finally an invisible sun sets behind hills we can't see for the fog.

Eventually a weekend comes when there is a dusting of snow on the ground . . . and it doesn't melt. There's no more hiding from the fact; the last of the club ships are put away and the "year" is over.

Letters to the Editor

Further to the question of who has been the youngest pilot to solo in Canada; raised by William Dick of Buckingham (Letters Jan/Feb 75) and followed up re Michael Mayer at York Soaring (FREE FLIGHT

Mar/Apr 75). Michael Collins of Montreal Soaring Council soloed at the age of 15 years and one day.

On August 30th, 1975 Michael received his final solo check (on his birthday) by Col. Gordon Bruce. As the winds were quite strong and gusty the C.F.I. Bill Roach did not think it wise to turn him loose. However, on the following day (15

years and one day) Michael managed to be the first aircraft in line for tow. His first flight lasted 13 minutes and his second 28 minutes (Airport - Hawksbury, Ontario).
Cecil S. Collins,
Montreal.

Badges AND BADGE LEGS EARNED IN AUGUST 1975

SILVER C

#405 V. G. Ennis
Lakehead Gliding Club
#406 W. D. Gardines
Lakehead Gliding Club
#407 Hans H. Baeffli
Montreal Soaring Council
#408 Frank Hinteregger
Wide Sky Flying Club
#409 Chris Eaves
London Soaring Society

SILVER DURATION

G. Cantlie
Montreal Soaring Council
R. Hyam
at Black Forest, Colorado
Deana Goulin
Erin Soaring Society
M. Henry
Montreal Soaring Society
T. B. Galleger
Erin Soaring Society
T. Ullitz
Erin Soaring Society

SILVER ALTITUDE

W. Moms
Erin Soaring Society
G. Cantlie
Montreal Soaring Council
M. J. Heaton
Montreal Soaring Council

GOLD ALTITUDE

R. Hyam
at Black Forest, Colorado

Don't be a MoT Statistic

C40109 Aircraft Type: Schreder HP 14T Glider **Reg:** CF-HPI
Date/Time: 29Aug74 1530 CST **Operation:** Private - recreation **Damage:** Substantial
Place: 49/57N 97/36W Pigeon Lake, Man.
Locale: Soil strip 2800 by 300, 785 asl
Weather: Cloud 4500 broken, vis 15, temp 62, wind WSW 10
Pilot: Glider **Total Hours:** 310 **All:** 70 **On Type Last 90 Days:** 15 **All:** 14 **On Type**
Casualties: Crew: 1 uninj
Description of Occurrence: Directional control was not attained during take-off and the glider had turned approximately 70 degrees before the tow cable was released.



Rideau Club Host to Air Vice-Marshal

By Ray Wilson

Saturday, August 9, 1975 was a memorable day for Air Marshal A.E. Godfrey (Retired), as well as for our S.A.C. President, Walter Piercy. On this day, Walter had the honour and privilege of taking him aloft in Rideau Club's Schweizer 2-33A for his very first trip in a motorless aircraft — and this was only a few weeks after his 85th birthday!

Air Vice-Marshal Godfrey saw service as a pilot in World War I. After the war, he stayed on active service in the Royal Canadian Air Force, which received its "Royal" prefix on February 15, 1923, but which became officially the R.C.A.F. on April 1, 1924. By the end of 1923, five major R.C.A.F. stations were in full operation across Canada, in addition to the large training air-drome at Camp Borden, Ont. One of the five stations - the Jericho Beach Air Station at Vancouver, B.C.

for war in Europe. In 1923, under command of Squadron Leader A.E. Godfrey, M.C., A.F.C., and was staffed with two additional pilots and twenty-five men. Two hundred and seventy flying hours were recorded for 1923.

Walter said that just before take-off he asked Air Vice-Marshal Godfrey to follow through on the controls with him, and after they were in free flight at 2000 feet he would ask him to fly the aircraft.

During the tow he was interested in proceedings — the quietness particularly, as well as the typical power pilot's observation of the unnatural towing manoeuvre itself. After release, Walter asked him to fly straight and level for a horizon reference point, and as he did so Walter removed his hands and feet from the controls, and kept talking to him for 3 or 4 minutes as they cruised along. At this time, Walter observed to him that he flew the aircraft as though he knew something about flying — and to this remark, Air Vice-Marshal Godfrey replied that he had not his hands on the controls of an aircraft for 30 years! Walter said later that it was remarkable how relaxed he was, and how well he flew the 2-33 on his first trip — apparently, it is like riding a bicycle, once you can do it, you can always do it.

In 1926, a wealthy American private pilot, J. Dalzell McKee, undertook an extensive flight over Canadian territory. He purchased a Douglas seaplane of the type that had earned a high reputation on the U.S. Army Air Service flight round the world in 1924, and enlisted the aid of a Canadian airman as pilot — Squadron Leader Earl Godfrey, who was at this time attached to Headquarters Staff of the R.C.A.F. at Ottawa. Starting from Montreal, the route was planned via northern lakes and rivers, following the St. Lawrence and Ottawa Rivers to Ottawa, thence to Lake Nipissing, Sudbury, Longlac, Orient Bay, Sioux Lookout, Minaki and Lac du Bonnet. From this point the course lay by Grand Rapids, and west along the North Saskatchewan River to Prince Albert, then to Wabamun Lake near Edmonton. The airmen planned to fly over the Yellowhead Pass to the Fraser reaching the Pacific at Godfrey's old command, the Jericho Beach Air Station, Vancouver. It was an ambitious endeavour and a private venture, with no prize or competition involved. The flight took 9 days, but the approximately 3,000 air miles were made in the flying



time of 35 hours and 8 minutes. Not only were McKee and Godfrey the first airmen to cover so much of a trans-Canada route, but they were also the first to make a direct non-stop flight across the Rockies between Edmonton and Vancouver. Throughout the flight, the airmen were given the facilities available at the stations and bases of the Ontario Provincial Air Service and the Royal Canadian Air Force. In appreciation of this assistance, McKee established an endowment, with a Trophy, to be awarded annually to the person giving the most meritorious service in the advancement of aviation in Canada. It seems incredible now that it was to be another twenty-three years before the first non-stop trans-Canada flight was made — in January 1949.

During the 2-33 flight, the variometer showed a weak 200 ft/min UP indication, and Walter explained what was happening, as they circled and climbed a few hundred feet. This was a real revelation to Air Vice-Marshal Godfrey — he said he had read about sailplanes climbing on thermal currents, but had not realized what an exhilarating and satisfying experience this could be until now. Walter was pleased to be able to demonstrate a climb on this weak thermal, and to have him do the actual piloting on this, his first flight.

Although the Canadian Air Force had carried mail across Canada as far back as 1920, it was not until a flight was made by Squadron Leader Earl Godfrey in 1928 that

officially stamped air mail was carried on such a journey. Sponsored by the R.C.A.F., and using established bases across the country, the flight was scheduled to be made in 6 hops, only 3 of them for refuelling. The machine was a Fairchild seaplane, and for safety it followed a northern course, by way of many waterways and lakes of the region. The course was similar to that used by McKee and Godfrey two years previously. The mail carried on this memorable flight had a special, two-line description printed on the envelopes, just beneath the regular 5-cent postage stamp. It read, "Plane left Ottawa 7 a.m. September 5 - arrived Vancouver 6 p.m. September 8 - Insure your parcels at the post office". On each cover there is a special cachet: "Special - Canada Flight - Ottawa to Vancouver - September, 1928". Approximately 550 letters were flown, and all were back-stamped with a circular cancellation, marked "Vancouver, September 8, 6:30 p.m. 1928". Today a single specimen is valued at \$20.00 and at \$30.00 if signed by the pilot.

The 2-33 flight came to an end all too soon. A regular approach was started and the landing was made without incident. After the glider came to a stop, Walter asked Air Vice-Marshal Godfrey how he enjoyed his first glider flight. His reply was very pleasing to Walter's ears, because he said, "That was one of the most memorable flights I have ever had in an aircraft!"

The historical notes in the above article were taken from the book, "Canada's Flying Heritage" by Frank H. Ellis, University of Toronto Press, 1954.

If any S.A.C. Club-members have taken up as passengers in club machines, anyone older than Air Vice-Marshal Godfrey, the readers of Free Flight would like to hear about it. Just write a little story on the experience, and we will be pleased to put it into a future issue.

Club News

OKANAGAN SOARING CLUB

Our Schleicher Ka-7 is now operational. Except for one day flying at Vernon on September 7th, all flights have been made from the Salmon Arm airstrip. This is a 5200' gravel strip in beautiful surroundings of mountains and lakes. We have been flying every weekend and expect to continue until snow stops us. There are about 20 shareholding flying members and another 30 associate members. Most of the flying members are also experienced power pilots. Many have their own light planes. As you can guess, we are well set for towing.

Our home field has not yet been decided, for we plan to try a series of possibilities all the way from Salmon Arm to the U.S. border. This whole Okanagan Valley promises to produce excellent soaring with tall thermals, miles of ridge lift and plenty of wave.

So far most of our flights have been short training hops of about 20 minutes. Jack Scott with instructor Hans Kruiswyk holds the record for the longest (1:37) and the shortest (0:07) flights. Ken Thom has his Schweizer TG-2 flying also and has made a number of flights each weekend. This

winter we will be looking for a second trainer, 2-22 or 2-33. Any word of one will be appreciated.

Don MacClement

NEWFOUNDLAND SOARING SOCIETY

During the period 22 August to 21 September 1975, the Newfoundland Provincial Committee of the Air Cadet League of Canada conducted Glider Pilot training at Stephenville Airport. The program was carried out with the assistance and co-operation of the Canadian Forces in the form of lending equipment and vehicles plus their paying for the operating costs of these vehicles.

The first couple of weeks saw family flying for the Air Cadets in the area plus flying training for six ab-initio glider pilot students. Three of these students were females, one an officer and the other two cadets of the local 708 Stephenville Squadron. One cadet, Linda Ballard of Stephenville, flew her first solo in a 2-33A on 19 September. The other cadet was held up due solely to a mix up in getting her Student Pilot Permit back from MoT before we closed the program. We believe that Cadet Linda Ballard is the first female Air Cadet to fly solo in any gliding program in Atlantic Canada.

Gliding is relatively new to Newfoundland and we are now trying to get a full scale program operating in Stephenville for next year. We have a start already, as we have the instructors for such a program. These came from a SAC Gliding Instructors' course held at Stephenville during the last two weeks of our program there. The course was run under the guidelines used by Mr. Walter Piercy and material supplied by him. The course syllabus contained twelve hours of classroom work and individual instruction for three candidates in air work using the SAC Part 1 Instructors' Notes. The three candidates were the only ones in this area with enough experience to be eligible for Instructor Rating. These people have now been recommended for MoT Instructor and SAC Class 111 ratings.

We have formed a gliding club in this area and have registered with SAC under the name of Newfoundland Soaring Society and hope to live up to the name in the not too distant future. This area has great potential as a soaring centre with good lift and hill soaring in the Stephenville area. We will keep you informed of our progress.

John H. Williams

S.A.C. Directors Meet at Claresholm

A number of the Directors took advantage of the Nationals to get together for a discussion of S.A.C. business. Attending the meeting chaired by President Walter Piercy were Terry Beasley, Fred Becker, George Couser, Dave Parsey, Peter Trounce, Hal Werneberg and Secretary, Terry Tucker.

Peter Trounce reported on the Insurance Plan and a discussion was

held on the new premiums and alternative plans. A motion was carried to the effect that only club affiliated members, junior flying members and married couples would be eligible for coverage under the S.A.C. Insurance Plan.

Consideration for membership and insurance was given to the following clubs and soaring organizations; Okanagan Soaring Club, Base Borden Soaring Group, Omemee Country Club, Missisquoi

CLUB VOL A VOILES APPALACHIAN

High cirrus filtered sunshine over the airport. From 1500' a pilot could look below on the windy, grass strip beside the paved runway and see smoke drifting away from a small yellow wind break, and a tiny cluster of pilots and students huddled close to it. Supper was cooking over the fire.

We had thought Adolf was kidding when he proposed a whole pig supper as a special event to celebrate our best season. However, on a cold Saturday recently the ground crew was vying for the warmest spot on the field, right next to the spit. On it, turning slowly, our supper sizzled and browned over the coals. Later that evening we sat in the main hangar to a gothic feast of roast piglet, baked potatoes and beer.

For five years our club has flown one glider and dreamed of owning two. Finally it happened. Last winter several of us drove down to an air base near Trenton and stood in a heated hangar almost filled with a herd of immobilized jet fighters. Off in one corner was what seemed to be the remains of a dusty Bergfalke II. Wings lay flat on the cement floor; the fuselage was stripped of fabric below the plimsol

line; the boxy, old fashioned canopy made it seem like a relic of the thirties. But it had been carefully checked over, and, somewhat pleased with ourselves, we bought it.

This summer's terrific weather and the old Bergfalke have made the difference. We not only made enough money to pay off our bank loan, but we also stuck our noses cautiously westward in short cross-country flights. On one powerful day Adolf Scherbaum flew forty miles at 9000' without circling once! During this flight he slope-soared on the bright sides of a towering cumulus.

Now we are looking for a good single place for next season partly because a new prize is up for grabs. "The Migrating Eagle Trophy" donated by Bob Hyam is a challenge to members of CVVA and Mansonville clubs to attempt cross country flights between the two sites. Meanwhile the autumn cloud bases are lowering and the rain drifts more frequently across the airstrip. But it has been one of the best years, and next spring is just a short winter away.

K. Ward

FOUR NEW CANADIAN SAILPLANE RECORDS

Mrs. Antonia Williams of Vancouver flew a Standard Cirrus, CF-DMW,

from Crystallaire Airport near Pearblossom, California to a goal of North Las Vegas Airport, Nevada. This is a distance of 305 km and exceeds the Distance in a Straight Line and Distance to Goal records in the Feminine Citizen category. Both previous records were held by Mrs. Williams. Her flight took place on July 7, 1975.

On July 14, 1975 Mr. D. J. Marsden with Mr. E. Dumas flew his Gemini sailplane, CF-TKC round a 304 km triangle from Claresholm to Arrowwood to Vauxhall to Claresholm at a speed of 69.9 km/h to claim the Canadian multiseat 300 km speed triangle record in both the citizen and territorial categories. The flight was made while competing in the Nationals contest.

On August 7, 1975 D.R. Band flew a Schweizer I-35 sailplane, C-GYSA from Arthur Gliderport, Ontario to Tillsonburg Airport. The distance of 105 km was covered at a speed of 59.4 km/h. This is a new record for the 100 km Speed to Goal in both the citizen and territorial categories.

Soaring Club, Alberta Soaring Council, Laurentian Gliding Club and Provincial Motorgliding & Soaring Association. Consideration and approval was given for proposals regarding the editing and printing of FREE FLIGHT for the coming year.

By-Law amendments and various Notices of Motion concerning the Constitution were discussed and the formal Notices of Motion will be

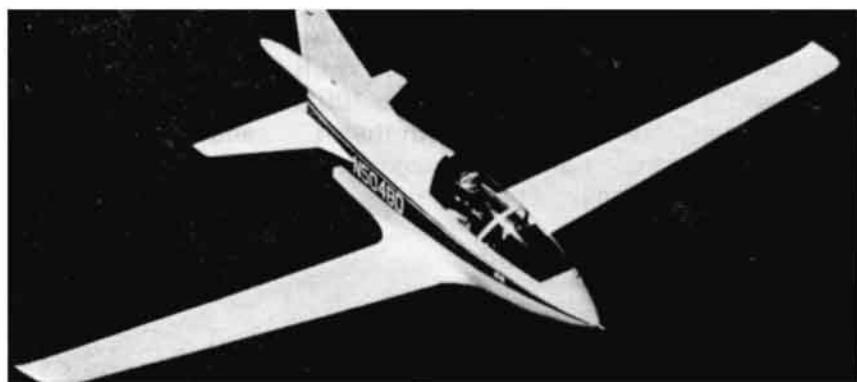
published in FREE FLIGHT prior to the AGM so that all members may give these proposals their consideration. Membership fees and the membership year were discussed and a motion was carried proposing a new schedule of fees which will be presented at the AGM in March of 1976. Many other topics including Instructors' Course, Tow Pilot Recognition, Self Launching Sailplanes, Sports Canada Grants, 1976 AGM, World Contest Committee, Public

Relations, Trophies, MoT Licence Requirements and Funds for the Nationals kept the directors busy until adjournment late in the afternoon.

While the formal meeting concluded late Saturday afternoon; discussions continued at the field through the following days of the meet whenever the time permitted.

The BD-5S Sailplane

by Elemer Balint



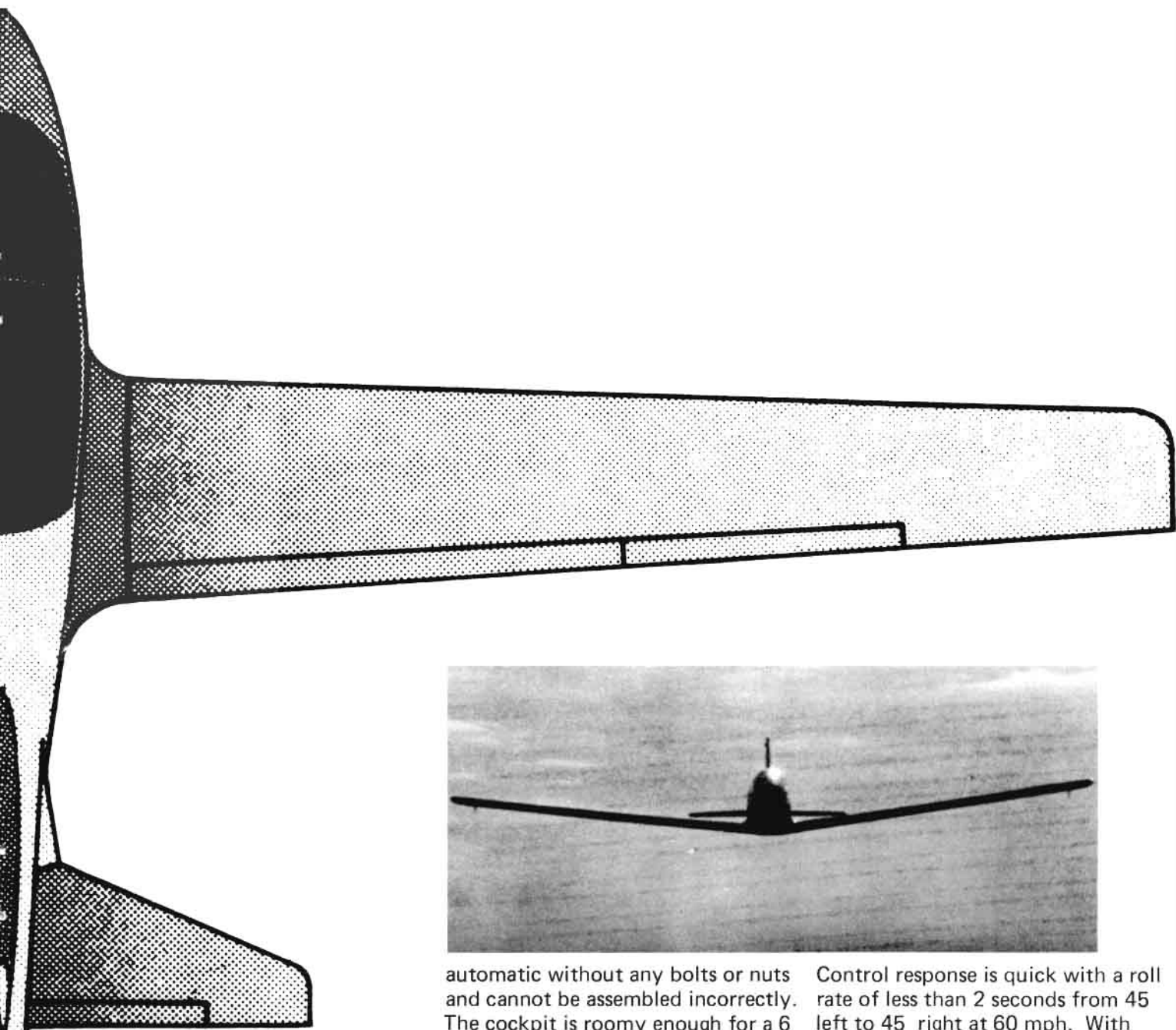
At a recent visit to the Bede Aircraft plant in Newton, Kansas I had the opportunity to closely examine the sailplane version of Jim Bede's famed BD-5 Micro and was much impressed with its size, quality, comfort and performance.

We arrived at the Newton Municipal Airport on Friday, May 16th about 8:00 PM. While tying down our aircraft I noticed the unmistakable figure of Jim Bede approaching. Although I have not

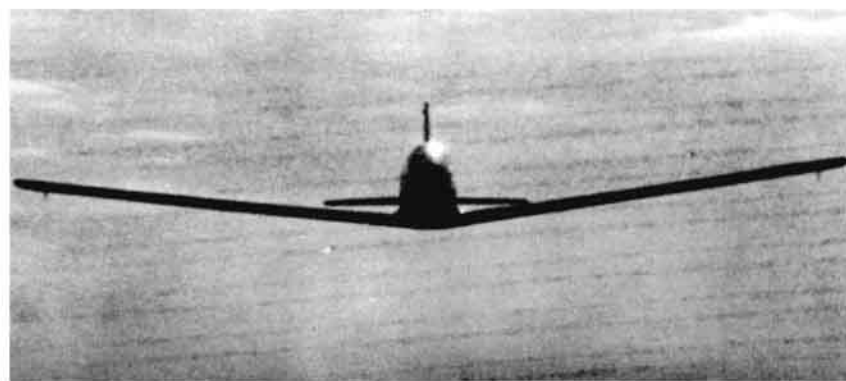
met him before, there could be no doubt of his identity. For such a controversial personality he was surprisingly relaxed and exhibited none of the high strung traits I expected of him. At the eve of a two day convention of BD-5 builders he seemed to have all the time in the world and offered to drive us to our hotel in Wichita.

During the drive at a leisurely pace he answered all our questions with complete openness and from his answers the following picture emerged.

The BD-5S is essentially the same aircraft as the BD-5 but with a 30 ft wingspan instead of the 21.5 ft. of the standard version. The main spar was moved forward in order to compensate for the missing engine. It has flaps allowing a 38 mph stall speed, retractable dual main wheels in the centre of the fuselage with



hydraulic disc brakes and retractable nose skid. To say that it stops on a dime is the understatement of the year. Empty weight is 220 lbs. and the wings can be taken off and replaced in less than ten minutes by one man without assistance. Control connections for flaps and ailerons are



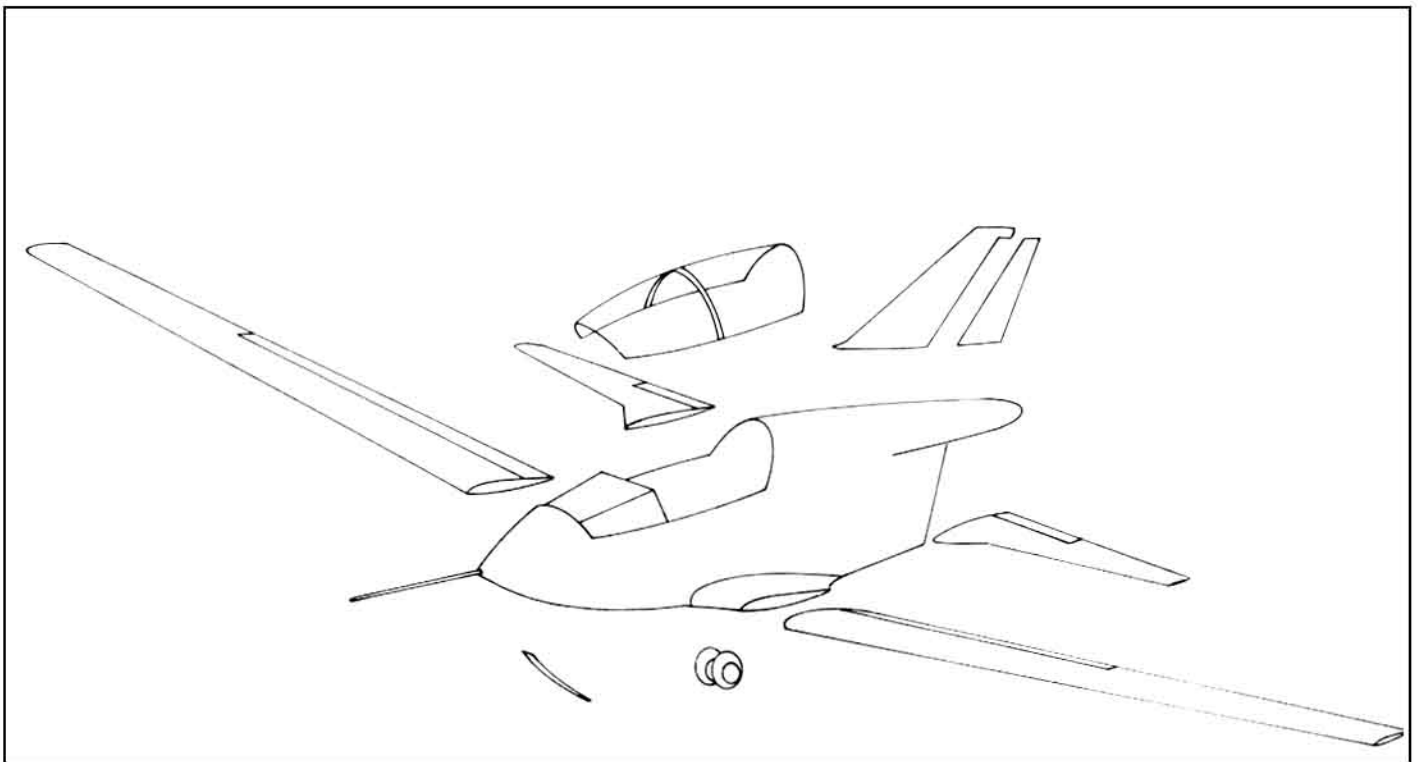
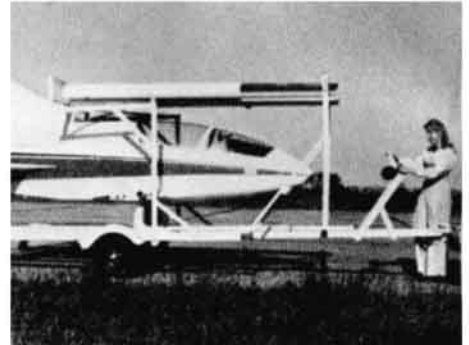
automatic without any bolts or nuts and cannot be assembled incorrectly. The cockpit is roomy enough for a 6 ft. 4in. man, visibility is superb in all directions and all controls are conveniently placed.

Construction is all metal, the stiffness of the fuselage and control surfaces is outstanding and were tested to over 400 mph with the jet version in actual flight. The main spar is tubular aluminum and was flown to 200 mph in a dive without any sign of stress or flutter.

Control response is quick with a roll rate of less than 2 seconds from 45 left to 45 right at 60 mph. With anti-servo tabs on both the rudder and elevator, control feel and effectiveness is excellent and very light. Stability is outstanding and properly trimmed it will fly hands off for extended periods.

Performance using the same profile as the powered version is 23:1 L/D and 2.8 ft/min. minimum

Trailer transport



sink. Considerable improvements are expected once the wing with either a Wortmann or NASA GAW-1 profile is installed; development is continuing in this area.

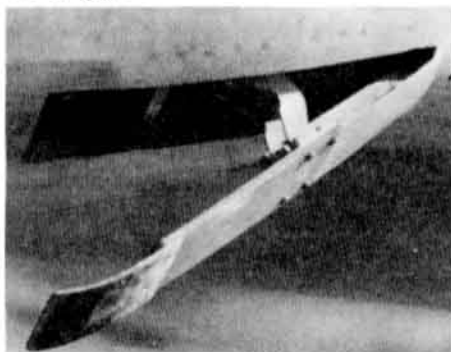
The following day we inspected the glider and it is a little gem. It is so tiny it is hard to believe the roominess of the cockpit until tried. I did my best to convince Jim that he should let me fly it and almost succeeded when Les Berven, his chief test pilot, objected

on account on the spin tests not having been completed yet. He took it up himself instead and the little toy seemed rock steady on tow. I timed his descent (no thermals) from 2500 ft. in 15 minutes which confirmed the claim of 2.8 ft/min sink. I really fell in love with it.

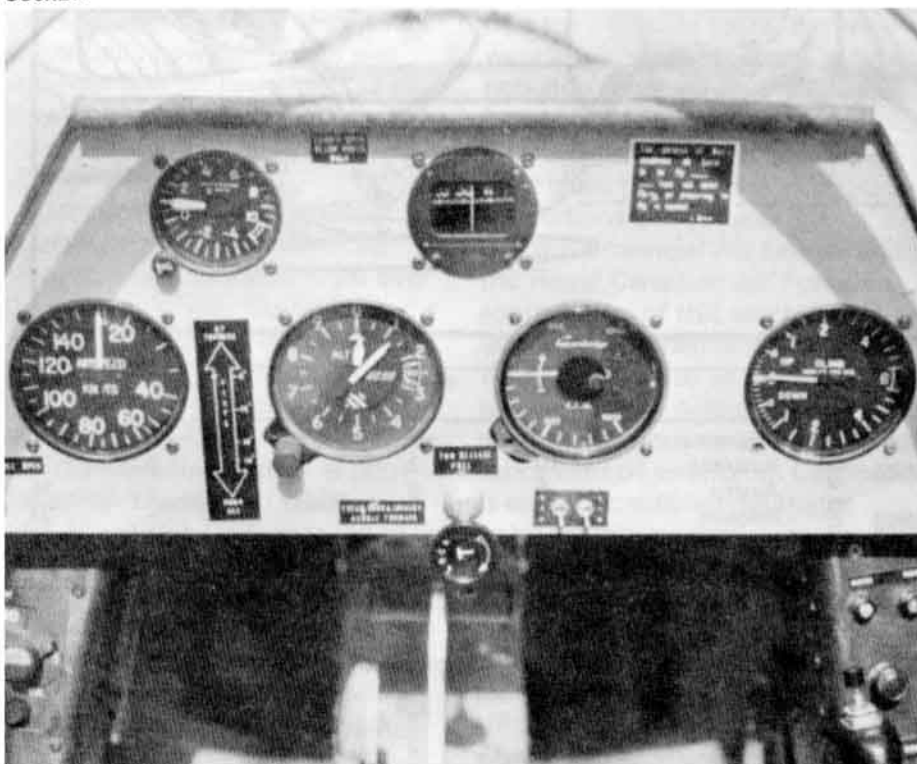
Later I had my chance to fly the Bede trainer which is the best training device since the rubber band. A BD-5B is installed on a ball joint at its centre of gravity on the end of a long boom attached to the front end of a pick-up truck. The

boom is spring loaded to zero weight the pilot is installed and connected to the driver with intercom. After a short briefing from the driver, he will push you along the runway. Steering on the ground is by differential braking up to approximately 20 mph after which there is positive rudder control. Lift off is at 45 mph and you can get as high as 10 ft. before the boom limit is reached. Control response is

Landing gear



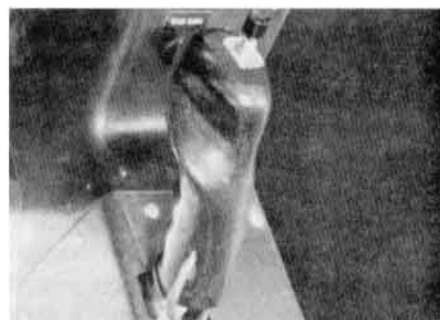
Cockpit



perfectly natural and you really fly the thing, controlling about all three axes. With the exception of some vibration transmitted through the boom structure from the truck the sensation of free flight is perfect. Even on one run along the 7000 ft runway there is ample opportunity to sort things out, do several take offs and landings and grin like a cat that swallowed the canary. Les Berven stated that the aircraft is easier to fly than the trainer and if it is true it must be nothing short of phenomenal.

Since I am presently constructing a BD-5B and have the wings approximately 80% and the fuselage about 65% complete, I can categorically state that it is the most complete set of drawings, instructions and materials ever put in the hands of homebuilders. In my estimation, a reasonably skilled amateur could finish the BD glider in one winter's spare time work. The price? Jim Bede said \$2400.00. Frank Andrews quoted \$2200.00; whichever is correct, the price includes everything

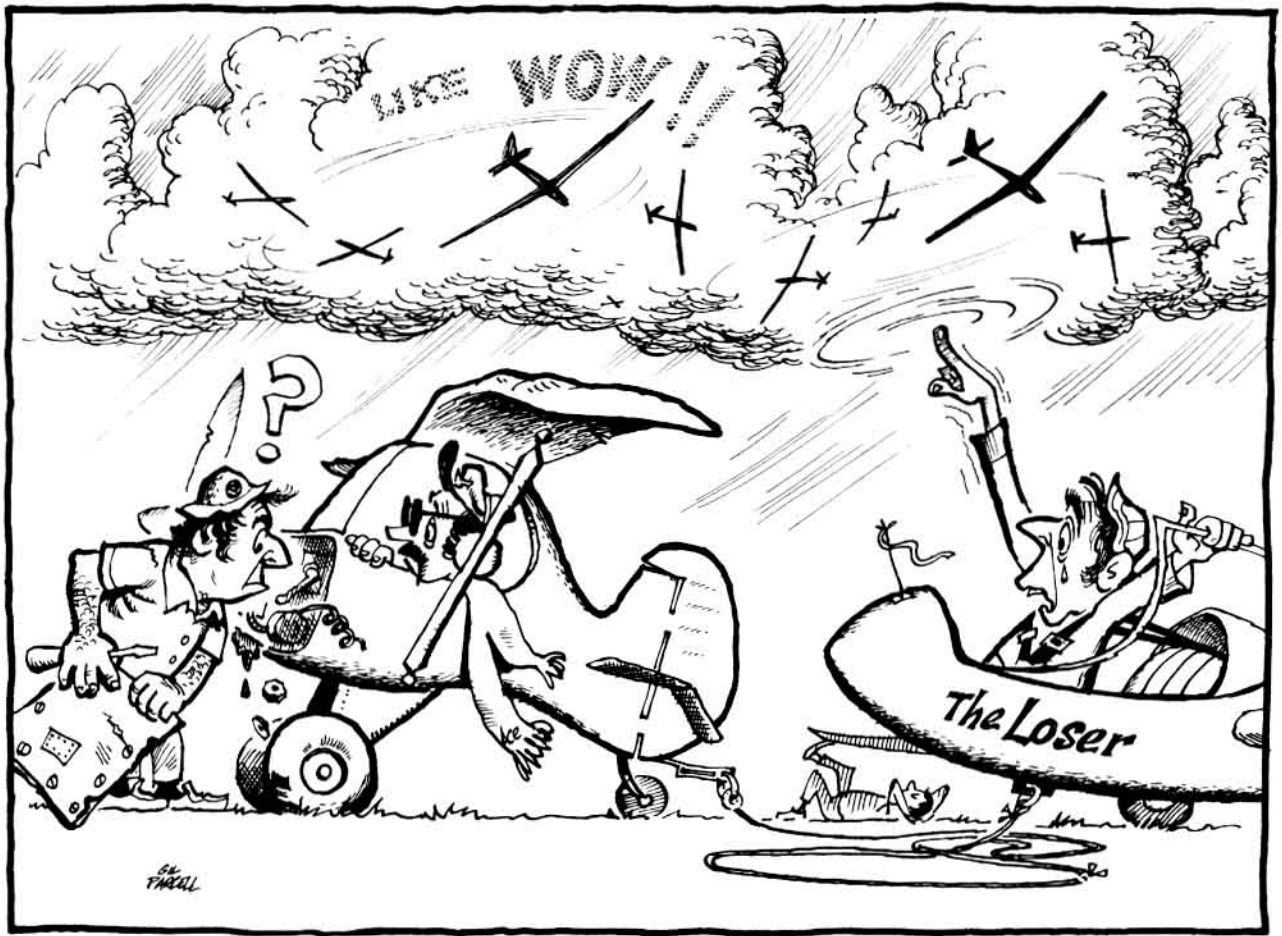
Side stick control



to the last cotter pin and it is a steal. The end of the line is at your nearest mailbox, don't miss it.

After the seminars on construction, performance and other details of the various Bede products, a most convincing flight demonstration was staged by three jet-powered and two propeller driven BD-5B's. Formation aerobatics and a stunning sixteen point roll at ground level by Corky Fornoff. After believing we had seen everything possible, one of the jets performed three continuous snap rolls going up vertically, then a tailslide and a spin. It looked like a piece of cake.

When all the dust settled and we walked back to our faithful Tri-Pacer which carried three of us from Elmira to Kansas in eleven hours the previous day, it looked clumsy, drab and singularly unattractive. In fact, so did all the other aircraft next to those tiny marvels of Jim Bede.



Statistical Data: Polish Gliders Throughout the World

(By the end of 1974)

	Bocian	Pirat	Cobra	Jantar	Others
Argentina	-	9	-	-	1
Australia	10	2	2	2	10
Austria	6	5	2	-	16
Belgium	2	-	-	-	27
Bulgaria	6	-	3	-	9
Canada	-	3	1	-	-
China	12	-	-	-	75
Czechoslovakia	-	-	2	-	-
Denmark	9	4	3	-	19
East Germany	152	205	12	2	95
Egypt	40	-	-	-	10
Finland	5	2	1	-	16
France	2	2	2	1	3
Greece	2	-	-	-	1
Holland	1	5	2	-	1
India	2	-	-	-	1
Indonesia	-	-	-	-	9
Italy	1	3	1	-	1
Japan	2	-	-	-	-
Korea	1	2	-	-	-
Norway	-	2	-	-	1
New Zealand	-	6	2	-	-
Portugal	-	-	1	-	1
Rumania	-	-	-	-	17
Spain	-	33	-	-	3
Sweden	2	27	-	-	8
Switzerland	5	9	7	3	22
Syria	1	-	-	-	-
Tunisia	6	-	-	-	-
Turkey	-	-	14	-	4
United Kingdom	29	34	-	1	6
U.S.A.	-	2	58	1	2
USSR	1	7	5	1	54
West Germany	1	3	-	-	11
Yugoslavia	-	3	-	-	-

Technex International Limited,
2600 Brabant Marineau, St. Laurent, Quebec.

Bocian-9E Two Seat Trainer



The latest version of one of the most popular two-seat sailplanes in the world, the Polish BOCIAN 9E is now available in Canada. Ideal for club or individual ownership, the BOCIAN is suitable for primary or advanced training, competition, aerobatics, instrument and night flying.

Thanks to long production runs (now over 400 planes produced) we are able to offer BOCIAN for the extremely competitive price of \$9,300.00, including full dual controls, common instrumentation and automatic disconnection of rudder pedals. Standard equipment includes six instruments.

Delivery under three months.

For more information contact:
Technex International Ltd.
2600 Brabant Marineau
St. Laurent, Quebec.

Soaring Supplies Registered
P.O. Box 621,
St. Laurent, Quebec.
Dan Pandur
9551 102 Avenue
Edmonton, Alberta

Western Ontario Soaring Supplies
814 Dulaney Drive
London, Ontario N6C 3W4

Fly Finnair to the World Championships

Peter Zimberg, the Toronto sales representative for Finnair has explained several alternatives available for those interested in flying to Finland next summer.

Peter says that the best buy for the individual is the "Apex-ticket" which is a round trip advance purchase with limited stay. You reserve and pay 60 days in advance of travel and stay a minimum of 22 days. The cost is \$483. in June and \$390. in May from Toronto. Weekend travel is a little more and there are penalties if you have to cancel.

The "normal" excursion ticket for 22 to 45 days allows one stop-over and the Toronto-Helsinki rate is \$811. in June and \$725. in May.

There is a group air fare for a minimum of ten people travelling together; it is a 14 - 21 day period and requires a prepaid land arrangement of \$110. minimum. This could include accommodation, a cruise to Leningrad or even the rental of an aircraft. The cost is \$578. with the usual weekend surcharges.

All these prices are via New York as Finnair does not fly directly to Canada. The rates include Air

Canada to Kennedy or American to La Guardia in which case you are entitled to a free helicopter transfer to JFK. This is an eight minute hop in a Sikorsky S-61 turbine powered chopper which can be a fun experience if you have never flown in a helicopter.

You can also arrange before you leave for one of the "Finnastic Tours" to Norway's North Cape, to Leningrad or a Finnair Midnight Sun Flight to Lapland.

Firmal Electronics Sales and Service For: The Cambridge Variometer System

We will continue to offer '74 prices until December '75.

Cambridge Speed Director (See October *SOARING*) - fits late model CAI Varios; conversions available. \$310.00

See August *FREE FLIGHT* for other CAMBRIDGE items.

A down payment of 50% will hold an order till March '76 at these low prices.

Firmal Electronics Box 8064
Ottawa (613) 731-6997

Classified Ads

FOR SALE

Open Class Cirrus in immaculate condition with metal trailer and instruments. Competition equipped. \$15,000.

Peter Lamla,
#117 - 685 Azure Rd. N.,
Richmond, B.C.,
V7C 2P6

PIK 20

Delivery position for April 76 available at cost
Help put a student through college.

John Firth,
542 Coronation Avenue,
Ottawa.
(613) 731-6997

FOR SALE

Schweizer 1-20 (SGU 1-19 #37 with wing modification kit installed 1954) Soarable antique or cheap sailplane, never damaged, always hangered, instruments, \$2,000.

D.G. Dalrymple,
Box 1030,
Deep River, Ontario,
K0J 1P0
(613) 584-3616

WANTED

Medium Performance Single Seater
Ka6, LP49, HP14 or equal

CVVA
Box 271,
Sherbrooke P.Q.
(819) 569-7277

WANTED

Skylark 4, Dart, 1-23G, H or similar in good condition. Equipped or not. Trailer preferred.

Murray Shubaly,
Box 1372,
Deep River, Ontario,
K0J 1P0
(613) 584-2888

Welcome to
Finland for the
15th World
Gliding
Championships

Please mail the coupon below to:
FINNAIR The Official Carrier of
World Gliding Championships 1976
8 King Street East,
Toronto, Ontario.
M5C 1B6
Telephone (416) 362-1511

June 13-27, 1976
Räyskälä,
Finland



FINNAIR
8 KING STREET EAST
TORONTO, ONT. CANADA
M5C 1B6

Atlas Travel Service
103 Roncesvalles Ave.,
Toronto.

I Want More Information About
☐ Gliding Championships
☐ Canadian Group Departure 4 June

Name

Address

City

I am Travelling Individually
I Belong To

☐ Canadian Group Departure 10 June
☐ Additional Tours in Finland, Scandinavia, USSR

Telephone

With Group
Club

Turns on Tows



by Thomas A. Reisner

Gliding, as every skill-demanding activity, has its quota of superstitions and fallacies which sometimes, through lack of critical thought, acquire the virtual stature of dogma. But while in most artforms theoretical misconceptions may hold little danger for those who accept them, in gliding they can have serious consequences: sloppy and inaccurate flying, bad spur-of-the-moment decisions, perhaps even loss of aircraft and lives.

Much of the (so-called) expert opinion on how to pilot a glider on aerotow is of this type. It is frequently stated (among others, by Richard A. Wolters in his *Art and Technique of Soaring*) that the proper method of turning a sailplane on tow is by overuse of the rudder and underuse of the ailerons: the machine is yawed towards the tail of the tug while the angle of bank is kept relatively slight — as Wolters suggests, approximately one half of the towplane's roll angle. The fact that this procedure results in continual skidding, with a consequent drop in lift and increase in the drag of the glider, appears to make little difference to the doctrine; the theory is that the sailplane requires less bank because at any given tow-speed its wings develop more lift than the airplane's.

In fact, both analysis of what happens on tow and the method

prescribed to correct it are wrong. It is basic in aerodynamics that given equal airspeeds and angles of bank, the rate of turn of any two aircraft will be the same. This is so regardless of whether one aircraft weighs one thousand pounds and the other ten thousand, since the centrifugal and gravitational forces, whose precise equilibrium gives coordination in flight, are both equally dependent on mass. The angular velocity of the aircraft alone determines how much bank will be needed to neutralize the quantum of forces, and that depends on two factors only: forward speed and rate of turn. Since the physical coupling of tow-plane and glider practically assures that their speed is identical, their rates of turn can be readily equalized by rolling each aircraft to an equal degree. (If the logic of Wolters' argument were accepted, it would mean that even in normal straight flight the glider should be flown uncoordinated on tow — a suggestion that no one, to the best of my knowledge, has ever seriously made.)

But what about the additional lift generated by the wings of the glider? How is it taken care of? The answer seems to be, by a nose-down pitch attitude, the trim normally assumed by a glider on rapid tow. By lowering the nose, the excess lift is actually converted into forward thrust relative to the flight path; the vertical (upward) speed of the glider is consequently diminished but so, at the same time, is the drag on the tug. The diagram above,

somewhat exaggerated to make the point clear, illustrates how this result comes about: Notice that the difference in pitch-attitude compensates for the greater lift of the glider. The resultant flight paths of the two craft are parallel due to the forward tilting of the sailplane's lift vector.

Anyone that has ever had the experience of piloting a slow and ponderous glider, such as a 2-33, behind a relatively fast airplane, such as an L-19 flown in gusty conditions, will remember the heavy stick-pressures required to keep it from ballooning uncontrollably in straight flight. With what little I know of aerodynamics, I can see no reason for supposing that this nose-down attitude is not all that is needed to keep the glider on the tail of the tug in a turn as well as in flying along a straight line. Although at normal aerotow speeds there is little danger in skidding a glider (especially the 2-33, which is virtually spin-proof), the use of Wolters' "flat-turn" method is both aesthetically unsatisfactory and aerodynamically wasteful. At the risk of offending a venerable old idol, I always suggest to my students to keep the glider's wings parallel to the tow-plane's, and find that this simple procedure not only contributes to a more pleasant sensation in the seat of the pants but also assures more accurate turns, quicker tows to release height, and therefore less wear-and-tear on the aircraft.

THROUGHOUT CANADA. FLY CP AIR AND TASTE THE DIFFERENCE.

Come fly with us throughout Canada on one of our beautiful orange CP Air jets.

And we'll try our best to show you the kind of service that's earned us quite a reputation.

Whether you're flying on business, or vacation, we'll show respect for your time with a choice of many convenient flights. Every day of the week.

We'll show you warm, honest friendship and hospitality in the way we greet you, serve you and make you feel welcome. Going and coming.

And we do all this because we want our part of your trip to be something very special.

So call your travel agent. Or CP Air.

Then fly with us throughout Canada.

We'll show you we're more than just another airline.



THROUGHOUT CANADA. ORANGE IS BEAUTIFUL.

CP Air

Hangar Flying

SEPP FROESCHL APPOINTED FAI REPRESENTATIVE TO ICAO

ICAO is the international body which draws up standards and conventions to be followed by civil aviation throughout the world. With headquarters in Montreal, 129 nations are represented and there are 33 permanent seats held by representatives of governments.

The Federation Aeronautique International (FAI) is the international body which draws up standards and conventions for sporting aircraft and air sports throughout the world. It has sections for air racing, aerobatics, ballooning, sport parachuting and of course, gliding.

Dr. Sepp Froeschl has been appointed FAI representative to ICAO. In this capacity he is the spokesman for all non-commercial aviation, private flying, ballooning, homebuilt aircraft, as well as gliding, from all countries; surely a very responsible position and one which could influence the attitude of governments in no small way. The appointment was made at the FAI meeting in Sydney, Australia in November 1974 and the tenure is for one year, but generally the representative is re-elected and serves for three or more years.

Sepp is well known to many SAC members because of his interest and contribution to the soaring movement; a word about his background is therefore appropriate. He has been associated with gliding since 1936 and with model flying before that. He started flying training in gliders in 1937. After war service in the German air force, he took up gliding again in 1947 in Austria where he instructed and was a competition pilot. He contributed on the administration side also, being a founding member of the Austrian Aero Club; and was responsible for bringing Austria into the air cadet exchange program.

Turning to commercial flying as a career, he obtained a British Senior Commercial Pilots Licence, passing the instrument flight test in 1952. He joined the Austrian air line and served as pilot and later as chief executive. Sepp did not give up gliding however and took part in competitions in the early fifties.

Obtaining a doctorate in mathematics in 1960, he decided on meteorology as a career. He came to Canada in July 1965. With a keen interest in providing meteorological advice for soaring, he lectured at a SAC instructors' course, was asked to return by Walter Piercy, and has given his services at the Eastern instructors' course for 7 years. He wrote the SAC bulletin on use of the tephigram and has brought the need for soaring meteorology to the notice of Environment Canada.

While attending the O.S.T.I.V. conference at Marfa in 1970, he offered his services as personal meteorological advisor to the Canadian Team at the 1970 World Gliding Contest. The late Wolf Mix attributed his success in obtaining 4th place in the Standard Class to the advice given by Dr. Froeschl. In 1972 he organized and was chairman of the international gliding forecasters conference in Vienna.

Sport aviation is fortunate to have in Sepp Froeschl a representative with such sincerity and dedication.

ONTARIO SOARING SOCIETY NIGHT SCHOOL COURSE.

This year OSS is once again running an evening course in the North York school system for the Glider Pilot Licence. The course last year was very well subscribed and the North York Board of Education has suggested that two courses be conducted this season.

This is a ten week course starting in January and already there are twenty-five paid enrolments. Anyone interested should contact Deryck Brown at (416) 759-7503

for information on the course locations and the evenings proposed.

CORRESPONDANCE with MoT

The MoT has requested that to avoid delays in correspondence it is essential to use your full name as it appears on your birth certificate or citizenship papers. You should also always quote their file number (if known) along with your licence number or permit number. Do not use initials, abbreviations or nicknames.

**CASTLEGAR, B.C. AIR CADET
TOPS 1975 CLASS OF RCAC
GLIDER PILOT TRAINEES**
Ottawa — Air Cadet Morley B. Armstrong of 581 Castlegar Squadron, B.C. has been named this year's winner of the Jonathan Livingston Seagull Trophy, presented annually by the Soaring Association of Canada, as the outstanding Air Cadet glider pilot trained in Canada in 1975.

The announcement by the Air Cadet League of Canada of Air Cadet Armstrong's selection said that he had taken basic gliding training under a summer program operated at Nanaimo, B.C. under the sponsorship of the Canadian Forces. At the completion of his course he was awarded an MoT Glider Pilot license and the Air Cadet Gliding Badge.

During this past summer the Canadian Forces operated five Air Cadet Glider Pilot training units in all parts of Canada. As a means of rewarding the top cadet at each location, the Air Cadet League arranged with the Schweizer Aircraft Corp. in Elmira, N.Y., to further train the five selected cadets to passenger carrying standards as laid down by the MoT.

During the special competition held at the Schweizer Soaring School, Cadet Armstrong topped the group as the most outstanding cadet.



The Pilatus B-4

- Sailplane single seater
- All metal standard class (15 meters)
- High performance (L/D 35.1 at 53 mph)
- Aerobatic
- A pleasure to fly
- Ideal for club and private use
- Competitive price
- Short delivery (monthly production: 12 units)
- Canadian type cert. No. G-96
- Demonstrator available for test flight (mid April / mid Nov.)

Made by
PILATUS AIRCRAFT LTD.
 Stans Switzerland,
 Builders of World renown STOL
 "PILATUS PORTER"

OFFICIAL AGENT FOR
 CANADA
PIERRE ROCHETTE
 C.P. 1543 Terminus, Quebec
 G1K 7H6
 Tel. 418-529-4164 Office
 Tel. 418-651-2939 Residence

FOR SALE

From Stock

- | | |
|---|----------|
| 1. Radair 10S | \$350.00 |
| 2. Radair 360 | 750.00 |
| 3. Telex Mike | 24.00 |
| 4. Stainless Steel 24" long Braunschweig | |
| A. Tail Mount (Direct Replacement of Venturi) | |
| or new installation | 17.00 |
| B. Fuselage Mount (12" Tall) .. | 14.00 |

(Brand new equipment, one and two year warranty)

Julius Nagy

Telephone 225-9433
 720 Conacher Drive,
 Willowdale, Ontario.
 M2M 3N6

Club Supplies

Item No.	Description	New Price	NOTES:
1.	F.A.I. Soaring Badges – "A" & "B" a) Button – Screw Back b) Button – Clutch Back – "A" only c) Pin – Safety Catch ("A" & "B") Balance of stock	\$ 4.75 5.00 5.50	1. Item 2 (b, c, d or e) available only from Mr. P. Coleridge, 80 Waverley St., Ottawa, Ont. K2P 0V2
2.	F.A.I. Gliding Certificates & Badges: a) Application Forms for Certificates & Badge b) Gliding Certificates – S.A.C. Member c) Badge – "C" (Button or Pin) d) Badge – Silver "C" e) Gold or Diamonds – S.A.C. keeps no stock but issues a letter of authority for the applicant to order directly from manufacturer.	n/c 5.00 18.00 6.00 7.50	2. All other items available from Box 1173, Station B, Ottawa, Ont. or Mrs. T. Tucker, 786 Chapman Blvd., Ottawa, Ont. K1G 1T9 3. All cheques payable to S.A.C. * Temporarily OUT OF STOCK
3.	F.A.I. Soaring Awards & Rules Booklet, 5/\$1.00 or	0.25	
4.	F.A.I. Sporting Code (English or French)	1.50	
5.	S.A.C. Instruction Manuals: a) Part I – Instructor's Guide b) Part II – Air Instruction Notes c) Part III – Student Notes d) Set – II Plastic Laminated Air Cards (5x8)	0.75 0.50 1.00 3.00	
6.	S.A.C. Tephigram & Weather Briefing Booklet 5/\$1.00 or	0.25 ea	
7.	Weather Briefing Form N-052 (8½" x 11 sheet)	n/c	
8.	Application for Official Observer	n/c	
9.	S.A.C. Blazer Crest (Navy Blue)	8.50	
10.	S.A.C. Decal	0.25	
11.	S.A.C. Tie (Navy Blue with Glider Design) *	2.75	
12.	S.A.C. Cap (Red, Green or Blue with white Crest)	3.50	
13.	S.A.C. Glider Pilot Log Book a) single copy b) 25 or more each	2.25 2.00	
14.	F.A.I. Cloth Badges – 3" diameter a) "C" b) Silver or Gold	0.75 1.50	