# TASK

Official Newsletter of the Southern Ontario Glider Group Inc.

Volume 16 Issue 3 June 2000

**Inside This Issue:**


- Getting the Bird
- History Page
- Thermal Seeking
- Membership List
- Events Calendar
- For Sale


## IF YOU BUILD IT……..

If you build it in time for the first contest, then that in itself should be worth bonus points…….
Got mine! How about you guys? See the CD for the special offers in the month of June.

The birds have flown! Most of the fledgling Birds of Time have fled the nest and are fending for themselves in contests and in search of thermals.

May has been a busy month, firstly a trip to England – with flying visits to the Shuttleworth Collection and the Aerospace Museum at Cosford, visits to several Pubs and a short course in grand prix racing. (How fast can you circle a round-a-bout three times before exiting on the right road?). Then another race to get the B-O-T ready for flying. Just made it in time for the first of the single design contests (with a little help from the weather).

Initial impressions of the Bird of Time are very positive. Although, a note of caution – screw up on the release and you can loose 300' in two seconds flat and then may have to bleed off speed with a low level inverted pass across the flying field – forget which way is up and all that will be left is feathers! But get this baby set up right and you will have many hours of fun.

Ever have that horrid sinking feeling that your million dollar aircraft has just taken a mind of it's own and refuses to respond to your commands? Good! That makes at least two of us. Last Saturday my Windfree did just that: ignored any commands from the transmitter and just hopped a thermal and sailed away. Oh serendipity! that was the phrase that came to mind. However sometimes the Sailplane gods smile kindly on the lesser mortals, the Windfree sailed over the woods and into the distance – no one would have guessed that it was flying free – and so the long search began. With the help of Ottokar K. a wide area was searched but no sign of any plane. Lunchtime rolled round, and having snatched a bite, the search was resumed – concentrating in the area of a tree farm. Again the search yielded no success. The ground search was called off at 3.00 pm and spirits were definitely low. Then when all else fails, inspiration takes over – why not check things out from above – so a quick trip to John C. Munro Airport, grab a quick flight in a small plane (and I mean small) and in less than twenty minutes what was lost is located (over a quarter of a mile further away than first thought) and suddenly the world seems a much brighter place. Recovery of the plane was straightforward, no damage at all except dud receiver batteries, and a massive donation of blood to the Mosquito Food Bank. Moral of the story, double check your batteries, don't think that charging and cycling them means that they hold a charge and don't use any but the best.

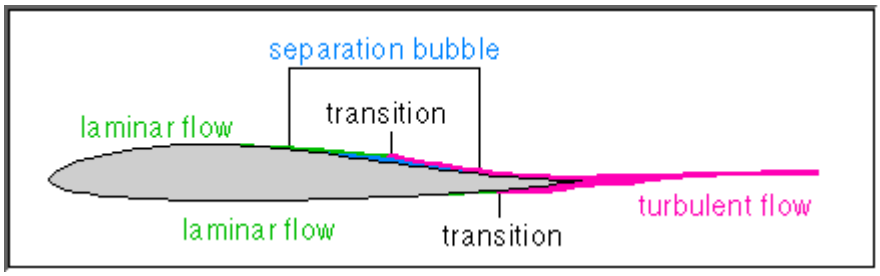
# Turbulators *by Martin Hepperle*

## Introduction

The additional drag, which arises from laminar separation bubbles, can be eliminated, by avoiding them or by reducing their size, using one of the following measures:

1. natural transition by shaping the airfoil geometry in such a way that the transition occurs already in front of the main pressure recovery region, where the bubble might occur, or by
2. forced transition by artificial disturbances, e.g. a turbulator. This device will usually be attached just before the region of laminar separation and has to introduce enough disturbances to cause transition into the turbulent state, before the laminar separation can occur.

For the low Reynolds numbers of model aircraft, forced transition by means of a turbulator seems to be more recommendable. A small drag increase in the high-speed regime is the cost which has to be paid for the bigger improvements at low flight speed. It is not a result of a bad design, when an airfoil needs a turbulator for best performance - at least not at Reynolds numbers below 1 million.



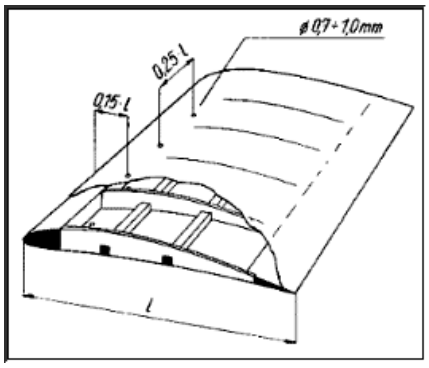

*The turbulator causes transition without laminar separation.*

## Mechanical Turbulators

A mechanical turbulator consists of a modification of the airfoil shape, which causes large local gradients in the shear stress of the fluid, which finally cause transition. It can be attached to the surface as a straight tape strip (also called a 2D turbulator) or it can be distributed in a certain area like zigzag tapes or single bumps, spaced equally. A different possibility, which has been used on free flight models, is a wire, which is mounted on small struts in front of the leading edge. This device is less sensitive to changes in angle of attack, but causes larger additional drag.
Typical values for turbulator height on model aircraft range from *0.2* for higher Reynolds numbers to more than *1 mm* for free flight models (see below for an approximate method to find a suitable turbulator height). Zigzag tape is used on full-scale gliders too, and is available from some manufacturers in different sizes.

## Pneumatic Turbulators

***Pneumatic turbulator for free flight models***

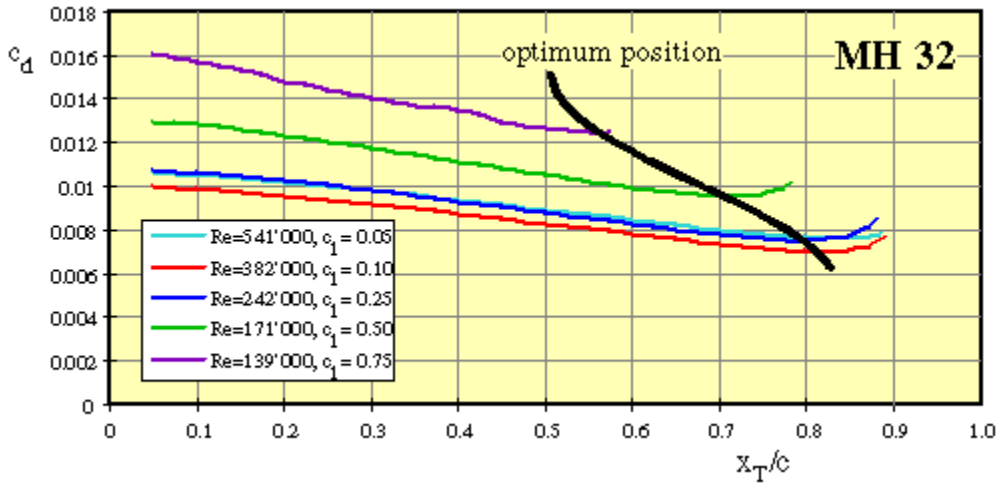



A different method to cause transition is the so-called pneumatic turbulator, which may even be controlled - either automatically or by a remote control system. Such devices are well known for years and have been used in man carrying aircraft as well as in model aircraft.
A pneumatic turbulator consists of an array of holes in the wing surface, which are used to eject a small amount of air into the boundary layer. If the amount of air is sufficient, the resulting turbulent wedges cause transition downstream of the holes. The flow through the holes can be driven by pitot tubes or by the pressure difference between upper and lower wing surface. By a clever selection of the chord position for the holes in the lower surface, the quantity of the airflow can be controlled

automatically, depending on the angle of attack. A drawback of pneumatic turbulators is their sensitivity to dust and dirt, which may fill the small holes, and the amount of work to install such a device.

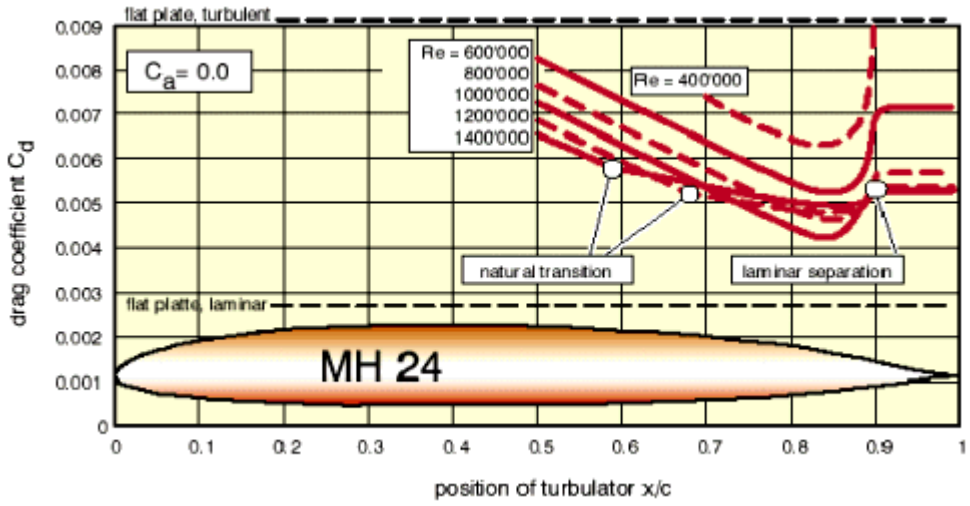
## Placing the Turbulator

The optimum turbulator should avoid laminar separation bubbles without increasing the drag. Unfortunately, on most high performance, low Reynolds number airfoils; the position of the separation bubble tends to move when the lift coefficient changes. Also the Reynolds number is depending on the lift coefficient: circling in a thermal requires high lift coefficients and low Reynolds numbers, whereas cruising at high speed leads to high Reynolds numbers at low lift coefficients. Thus a fixed turbulator will be a compromise: when it is located forward, to avoid bubbles at higher lift coefficients, it will create additional drag at lower lift coefficients, and when it is located more rearwards, it will be ineffective at higher lift coefficients.




*Calculated drag coefficient of the MH 32 for 5 different lift coefficient/Reynolds number combinations. Transition has been fixed at different x/c locations.*

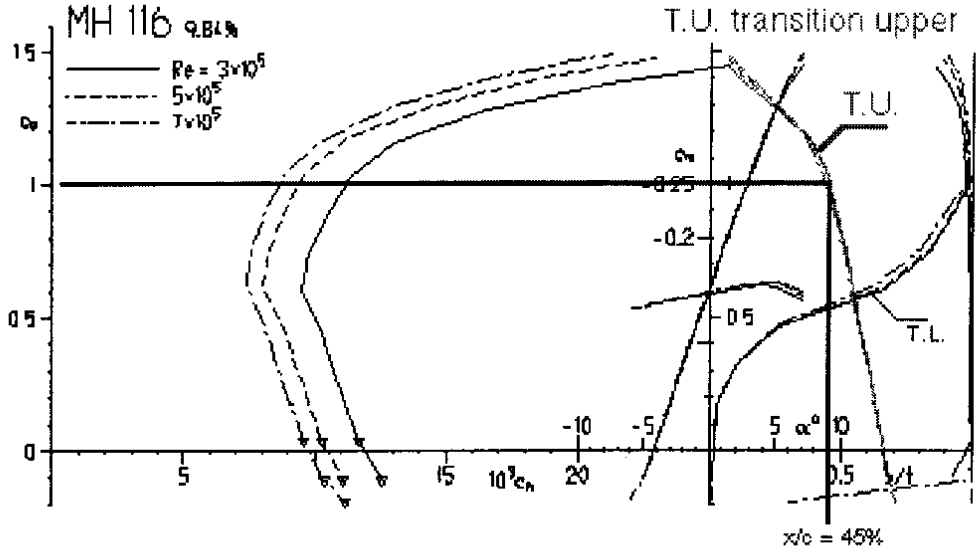
The figure above shows the results of a numerical experiment. For different combinations of Reynolds number and lift coefficient, corresponding to a typical F3B sailplane, the drag coefficient has been calculated. The transition has been forced to occur at different stations x/c, starting at *x/c = 5%*. Picking the curve for *Re = 171'000, Cl = 0.5* shows, that the drag coefficient decreases steadily, while we move the turbulator rearwards, until we reach a point where the curve levels out. This is the location, where the separation bubble starts. Moving the turbulator further towards the trailing edge leads to an increase in Cd: the turbulator is simply in or even behind the bubble and has no effect anymore. A useable compromise would be to place the turbulator somewhere between 60% and 80% of the chord length, say at 70%. If you were very picky, you would have to choose different positions along the span, depending on local Reynolds number and lift coefficient - but that might generally be considered harmfully close to splitting your hair.
In general, it is possible to design airfoils so, that the separation bubble stays at the same location, but this location has to be chosen according to the low Reynolds number case (close to x/c = 50% for the above example), resulting in higher drag at higher Reynolds numbers.
Turbulators are helpful not only at very low Reynolds numbers - even on full scale sailplanes turbulators are widely used to improve their performance. The figure below shows the results of a numerical study to find the optimum turbulator position on the MH 24 pylon racing airfoil, which operates at Reynolds numbers around 1 Million.




*Calculated drag coefficient of the MH 24 for different Reynolds numbers. The optimum position seems to be at 84% of the chord. The drag of the airfoil comes close to the flat plate with completely laminar flow.*

## Sizing the Turbulator

A typical mechanical turbulator consists of a strip of tape, attached to the wing surface. The chordwise position of the strip is depending on the airfoil shape. Of course it must be located in front of any laminar separation. The combined polar diagrams used on the airfoil data pages also contain the transition location, which can be considered the maximum downstream position of a turbulator; to be effective, a turbulator should be located 5 to 10% of the cord before this location. The polar diagram below shows how to find an initial location for experiments.



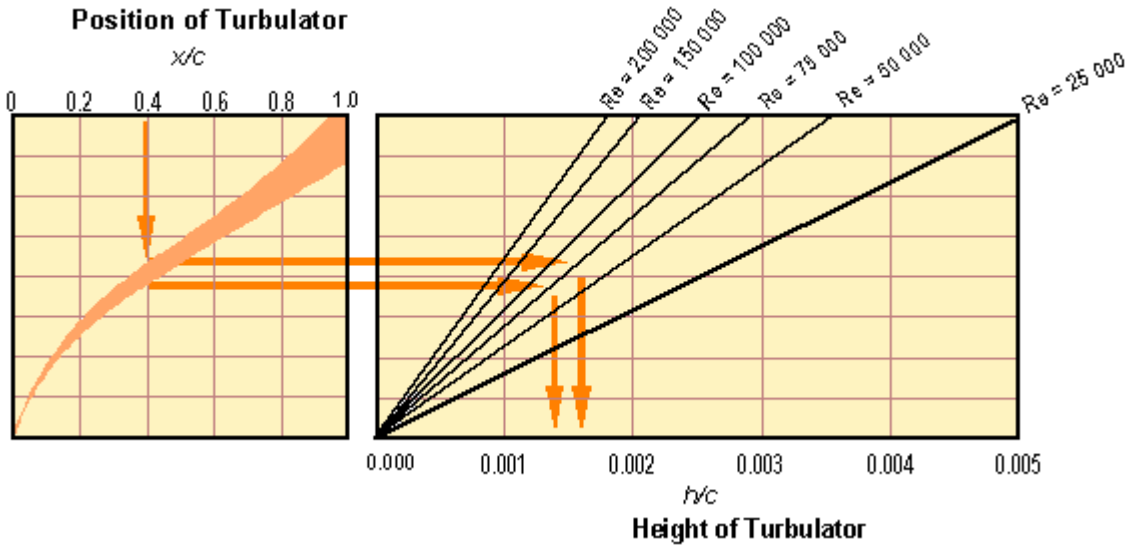

*Plot of the transition location in the polar diagram.*

For a selected lift coefficient of *Cl = 1.0*, we draw a horizontal line, which intersects the transition curve for the Reynolds number of interest. Moving down we can read the location from the *x/c*-axis. For the example, we find a value of *x/c = 0.45*, where laminar separation will occur, if no transition happened in front of this location. If necessary, a turbulator should be placed at *x/c = 0.4* or further upstream. There is also a curve for the lower surface

(T.L.), which can be used to define a turbulator position for the lower surface, but this is usually only needed for airfoils with additional camber located close to the trailing edge, as found in some full scale sailplanes.

A mechanical turbulator must have a certain minimum height to be effective. This height depends on the position of the device, because the boundary layer thickness is growing with increasing chord position. An additional parameter is the Reynolds number, which also influences the boundary layer thickness: high Reynolds numbers result in thinner boundary layers than small Reynolds numbers (at the same airfoil chord). The thickness of the transition strip must be sufficient to cause transition, but it should not be thicker than the boundary layer to avoid additional drag.

Close to the leading edge the boundary layer is very thin (1/10s of a millimeter), when the flow reaches separation, it can grow much thicker (in the order of millimeters for model airfoils). The following diagram intends to help you by giving a first guess on the thickness of a turbulator.




*Turbulator height selection chart.*

You enter the chart (after selecting a *x/c* position for the turbulator from the polars or the recommendations of the airfoil) at the top left axis. Dropping a line down to the orange band gives an upper and a lower intersection point, from each of which you draw a straight line to the right, intersecting the line matching the Reynolds number corresponding to the wings chord length. On the axis below, the approximate boundary layer displacement thickness can be found and used as a first guess for the turbulator height. The values found from the graph agree reasonably well with wind tunnel results [25], but further experiments will be necessary to find the optimum height (if such a thing exists at all).

**Example:** A wing has a chord Reynolds number of *Re = 75'000*. The chord length is *200 mm*. The airfoil designer recommends transition at *x/c = 0.4* by means of a turbulator. Entering the graph with these values a turbulator height of 0.0014 to 0.0016 times chord, which evaluates to a thickness of 0.28 to 0.32 mm.

## MINUTES OF SOGGI MEETING APRIL 9 2000

The meeting was called to order by Bud Wallace at 2:05 PM. There were 17 members present.
Minutes of the March 12 meeting were read by all.

ONE DESIGN CONTEST:

Stew Watson reported that Bird of Time kits could be purchased at Sunset Radio Control in Alberta for $90.00 plus s&h.
NEW BUSINESS:
Bud Wallace stated that Old Timer Kits may be purchased from Stu Pierce in Barrie.

Werner Klebert said he was contacted by the representative of the Dundas Model Show about putting a glider in the show. Werner was concerned about enough space for his current model. The show is on Saturday April 15 at St. James church in Dundas.

Dick Francis who lives in Dundas repairs and checks out R-C radios.

The topic about protection when transporting model planes was discussed. To make wing covers use a foam cored soft cloth. This can be purchased at Lens Mills Store in Stoney Creek for about $6.00 a pound.

FIELD:
There has been no word on when we can use the sod farm at this time.
Fred Freeman and Keith Armstrong installed a sign at the entrance to the field as to members only.
The flying out house had another short flight - no take off, just a crash. It will be returned to an upright position when flying commences.

CLUB DAY:
Werner Klebert will be the CD for the Club Day.
It was decided that the club would serve hot dogs and pop for this event. Bryn Rennie and Werner Klebert will look after purchasing the food. Bryn said he will supply a barbecue. It was suggested that T-Shirts be given as prizes for this event.

FLYING ACES:
Dick Fahey thanked the SOGGI members who gave a talk and demonstration to the Flying Aces .at their meeting last month.
Memo from Dick Fahey:
2000 FLYING DATES - SQUADRON 40 - FLYING- ACES CLUB
8:00 A.M. TO 12:00 Noon: Saturdays.
May 6, May 20
June 3, June 17
July 1, July 29
Aug. 12, Aug.26
Sept. 9, Sept 23.
All field rules and codes of behavior will be observed by Squdn. 40 flyers.
1/ For access to the field, use the roadway on the East perimeter only, (refer to maps distributed last year).
2/ No driving or parking on sodded areas, parking permitted on the East side of tile roadway, facing North

3/ retrieving of models beyond the East perimeter of the property prohibited. Dethermalizers should be set accordingly when FLYING from West to East.
4/ Regular members of S O G G I have the right-of- way, both airborne and on the ground.

Richard Fahey, Adjutant, Squadron 40, F.A.C.

SHOW AND TELL
Jack Linghorne brought in two kits for sale. Bryn Rennie showed his $10.00 foam plane. He used duct tape to strengthen the plane.
TREASURER'S REPORT:
Derek Hartwell reported there was no change in the Treasurer's Report. Derek sold club decals for $2.00 each.
AERO TOWING:
A meeting of the Aero Tow club will be held at the Burlington Clubs field on Kings Rd. April 15 at 2.00 P.M. All members of SOGGI are welcome to attend.

Meeting Closed at 3.15 PM.

## ONE DESIGN CONTEST PHASE 1

The first event for the Bird Of Time was held Sunday May 21 2000. As the May 14 date was rained out, the contest was rescheduled for May 21. The weather was still overcast but with light winds the contest was a success for six of the seven fliers.
Bud Wallace had two 6 minute plus flights to lead the way.

| | |
|---|---|
| Bud Wallace | 930 |
| Dick Colley | 726 |
| Keith Armstrong | 684 |
| Bob Batt | 554 |
| Derek Hartwell | 516 |
| Juri Vosu | 362 |
| Cliff English | 0 |

Next one design contest Sunday June 18.

## Triathlon Contest held on June 4th, 2000 at SOGGI Flying Field

CD: Cliff English Catering: Bryn Rennie

Sunday morning, slightly overcast and not too warm, a light breeze from NE, totally acceptable conditions for a contest to test the thermal seeking skills of the hardy boys assembled at SOGGI Field Primary.

There were 11 club members and two visitors from GNATS signed up to compete and with two wenches and a Hi-Start available for launching duties. With four rounds and landing points (graduated tape) as the Task, the competition began in earnest.

Werner Klebert, flying his immaculately prepared new Sailaire, set the pace in the first round with a 7:58 flight and 88 landing points. In the second round great flights were posted by Fred Freeman, Derek Hartwell and Zivko Rizonko with Werner K. and Bill Woodward in hot pursuit. In round 3 the honours went to Larry Literovich of GNATS (and a bumper 168 landing points, as well) with Werner K. again showing great consistency. Round 4 and guess who took the honours! But Fred Freeman and Bryn Rennie both posted great times.

Results:

| Contestant | FreqCH | | Round 1 | Round 2 | Round 3 | Round 4 | Total | Grand Total |
|---|---|---|---|---|---|---|---|---|
| Fred Freeman | 22 | Time | 04:10 | 10:01 | 02:32 | 08:06 | 24:49 | |
| | | Adjusted | 370 | 797 | 152 | 646 | 1965 | |
| | | Landing | 0 | 0 | 0 | 0 | 0 | 1965 |
| Albert Fund | 49 | Time | 03:25 | 03:05 | 04:35 | 05:26 | 16:31 | |
| | | Adjusted | 205 | 185 | 275 | 326 | 991 | |
| | | Landing | 0 | 0 | 96 | 0 | 96 | 1087 |
| Bryn Rennie | 31 | Time | 01:59 | 03:03 | 03:44 | 08:10 | 16:56 | |
| | | Adjusted | 317 | 183 | 284 | 610 | 1394 | |
| | | Landing | 32 | 0 | 120 | 0 | 152 | 1546 |
| Keith Armstrong | 53.1 | Time | 02:00 | 06:26 | 02:33 | 04:49 | 15:48 | |
| | | Adjusted | 320 | 394 | 153 | 289 | 1156 | |
| | | Landing | 0 | 0 | 0 | 0 | 0 | 1156 |
| Mike Kucera | 26 | Time | 04:35 | 06:11 | 05:46 | 04:00 | 20:32 | |
| | | Adjusted | 275 | 481 | 426 | 440 | 1622 | |
| | | Landing | 56 | 0 | 0 | 0 | 56 | 1678 |
| Larry Literovitch | 48 | Time | 05:02 | 03:48 | 07:53 | 09:20 | 26:03 | |
| | | Adjusted | 302 | 328 | 623 | 560 | 1813 | |
| | | Landing | 40 | 0 | 168 | 0 | 208 | 2021 |
| Derek Hartwell | 11 | Time | 05:06 | 09:58 | 03:23 | 02:57 | 21:24 | |
| | | Adjusted | 306 | 792 | 203 | 177 | 1478 | |
| | | Landing | 0 | 0 | 0 | 0 | 0 | 1478 |
| Dick Colley | 22 | Time | 01:54 | 02:56 | 02:40 | 03:53 | 11:23 | |
| | | Adjusted | 274 | 176 | 160 | 383 | 993 | |
| | | Landing | 0 | 0 | 0 | 0 | 0 | 993 |
| Otokar Koprinicky | 23 | Time | 03:21 | 02:40 | 04:35 | 02:31 | 13:07 | |
| | | Adjusted | 201 | 160 | 275 | 151 | 787 | |
| | | Landing | 0 | 0 | 0 | 0 | 0 | 787 |
| Cliff English | 57 | Time | 01:30 | 01:36 | 04:49 | 01:58 | 09:53 | |
| | | Adjusted | 90 | 108 | 289 | 312 | 799 | |
| | | Landing | 0 | 0 | 0 | 0 | 0 | 799 |
| Werner Klebert | 50 | Time | 07:58 | 05:58 | 08:14 | 09:54 | 32:04 | |
| | | Adjusted | 672 | 552 | 574 | 754 | 2552 | |
| | | Landing | 88 | 120 | 56 | 56 | 320 | 2872 |
| Bill Woodward | 28 | Time | 04:00 | 07:48 | 05:11 | 03:41 | 20:40 | |
| | | Adjusted | 440 | 568 | 311 | 251 | 1570 | |
| | | Landing | 152 | 0 | 0 | 0 | 152 | 1722 |
| Zivko Rizonko | 52 | Time | 03:23 | 10:10 | 02:06 | 05:55 | 21:34 | |
| | | Adjusted | 203 | 710 | 286 | 525 | 1724 | |
| | | Landing | 0 | 0 | 0 | 0 | 0 | 1724 |

The restless wind appeared for the latter two rounds and gave most people trouble in seeking landing points, but when all the dust had settled it was Werner Klebert who reigned victorious, with Larry L. of GNATS in second place and Fred Freeman, with some steady flying, in third place.

No planes were lost, bent or damaged in any way so we all live to compete another day.

Mike Kucera flying a Pelikan demonstrated what a zoom start can look like (try one of those with a Bird of Time!) and also how hard it is to see these sleek birds when they are edge on.

Larry Literovich on behalf of GNATS extended an invitation to any of our members to attend a Novathon, June 25th and an Open Thermal Duration Contest on August 6th, both to be held at Fenwick (see the MAAC Mag for more info)

**Is there anybody out there? – Who has an article inside just bursting to get out**
**- We publish for free!**

# For Sale: Want Ads: Personals

For Sale:

Bird of Time – Some(More) Impact Damage, ~~not~~ even good for Spare Ribs
(Barbeque fuel)
Plus ~~23~~ 12 sheets of 150 grit emery cloth (well worn – not good for lining cat litter boxes),
Charred Hair-piece and ~~three~~ one finger splint~~s~~ (FREE to good home)

For more Information Call: Harry 'Nails' Kneelson (360)-779-123

Wanted:

Gentle Lady or similar Docile Glider suitable for beginner Pilot.
Dust off those old collectibles and help a youngster discover the joy of soaring.

Contact: Bryn Rennie (905)-385-3365

## 1999 SOGGI Executive

President: Bud Wallace 905-274-3177
1060, Eastmount Avenue
Mississauga, Ont. L5E 1Z3

Vice President: Werner Klebert 905-578-9431
69, Byron Avenue
Stoney Creek, Ont. L8J 2T1

Treasurer: Derek Hartwell 905-578-7991
39, Isaac Brock Drive
Stoney Creek, Ont. L8J 2P1

Secretary: Cliff English 905-522-4561
24, Blackwood Crescent
Hamilton, Ont. L8S 3H5

Editor: Dick Colley 905-689-7761
101, Braeheid Avenue
Waterdown, Ont. L0R 2H5

**Deadline for June Issue of Task: May 22nd 2000**

# 2000 Calendar of Events

| | | | |
|---|---|---|---|
| • June 1-30 | B-O-T Postal Contest | CD | Stan Shaw (See March Minutes) |
| • June 4 | Optional Triathalon | CD | Cliff English |
| • June 11 | Golden Oldies | CD | BudWallace |
| • June 18 | One Design Phase 2 | CD | Bud Wallace/Cliff English |
| • July 9 | One Design Phase 3 | CD | Bud Wallace/Cliff English |
| • July 16 | Otto Bandman Club Day | CD | Werner Klebert |
| • | (Re-scheduled event) | | |
| • Aug l3 | One Design Phase 4 | CD | Bud Wallace/Cliff English |
| • Aug 27 | Novathon | CD | Fred Freeman |
| • Sept 3 | Big Bird Bash | CD | Werner Klebert/K. Armstrong |
| • Sept l7 | One Design Phase 5 | CD | Bud Wallace/Cliff English |
| • | | | |

# TASK

## MEMBERSHIP LIST

| | | | | | | |
|---|---|---|---|---|---|---|
| Keith | Armstrong | 219, Governors Road | DUNDAS | Ont | L9H 3J7 | 905-627-4011 |
| Peter | Ashton | 200, Edwin Street | Kitchener | Ont | N2H 4P2 | 519-576-6750 |
| Roy | Auwaerter | 9, Jamieson Drive | DUNDAS | Ont | L9H 5A1 | 905-627-8496 |
| Joseph | Baltaza | 19, Gaitwin Street | Brantford | Ont | N3P 1A9 | 519-751-3698 |
| Robert | Batt | 612, Blue Forrest Hill | Burlington | Ont | L7L 4H3 | 905-632-8790 |
| Rob | Campbell | 34, Hopkins Court | DUNDAS | Ont | L9H 5M5 | 905-627-9435 |
| Dick | Colley | 101, Braeheid Avenue | WATERDOWN | Ont | L0R 2H5 | 905-689-7761 |
| Cliff | English | 24, Blackwood Crescent | HAMILTON | Ont | L8S 3H5 | 905-522-4561 |
| Fred | Freeman | 511-120 Strathcona Ave N | HAMILTON | Ont | L8R 3J5 | 905-525-6509 |
| Albert | Fund | 73, Beech Street | CAMBRIDGE | Ont | N3C 1X6 | 519-658-9495 |
| Arnold | Gardner | 202, San Pedro Drive | HAMILTON | Ont | L9C 2E1 | 905-383-4418 |
| Don | Guthrie | RR4 | Belwood | Ont | N0B 1J0 | 519-843-4537 |
| Bob | Hammett | 183, Uplands Drive | KITCHENER | Ont | N2M 4X3 | 519-576-7636 |
| Derek | Hartwell | 39, Isaac Brock Drive | Stoney Creek | Ont | L8J 2P1 | 905-578-7991 |
| Werner | Hildesheim | 4, Foster Crescent | CAMBRIDGE | Ont | N1R 4R1 | 519-623-2663 |
| Herb | Jenkins | 238, Lloyninn Ave., | ANCASTER | Ont | L9G 1J1 | 905-648-6123 |
| Werner | Klebert | 59, Byron Avenue | STONEY CREEK | Ont | L8J 2T1 | 905-578-9431 |
| Otakar | Koprnicky | 75, Hazelwood Crescent | CAMBRIDGE | Ont | N1R 8A4 | 519-740-9504 |
| Herb | Lentfer | 23, Walsh Court | BRANTFORD | Ont | N3T 5Y1 | 519-753-2856 |
| Jack | Linghorne | 55, Angelsey Boulevard | ISLINGTON | Ont | M9A 3B8 | 416-233-0230 |
| Ken | Lockwood | 29, Cross Creek Blvd., | Guelph | Ont | N1H 6J2 | 519-821-9947 |
| Tom | McCann | 2206, Townline Crescent | OAKVILLE | Ont | L6H 5H4 | 905-257-2101 |
| Mike | Penney | 388, Massey Drive | ANCASTER | Ont | L9G 3J9 | 905-648-5843 |
| Paul | Penney | 388. Massey Drive | ANCASTER | Ont | L9G 3J9 | 905-648-5843 |
| Bryn | Rennie | 22/1255 Upper Gage Avenue | HAMILTON | Ont | L8W 3C7 | 905-385-3365 |
| Zivko | Rizoniko | 479, Fendalton Street | MISSISSAUGA | Ont | L5B 2L8 | 905-275-0597 |
| Ann | Tekatch | 19, Pheasant Place | Hamilton | Ont | L9A 4Y4 | 905-575-5433 |
| Bob | Thayer | 4108, Millcroft Park | BURLINGTON | Ont | L7M 3V9 | 905-336-3290 |
| Mike | Thomas | 61, Alhart Drive | ETOBICOKE | Ont | M9V 2N1 | 416-748-2833 |
| Walter | Tremmel | 56-600 Silvercreek Blvd | MISSISSAUGA | Ont | L5A 2B4 | 905-270-5959 |
| Juri | Vosu | 3291, Candela Drive | MISSISSAUGA | Ont | L5A 2V1 | 905-279-9549 |
| Bud | Wallace | 1060, Eastmount Avenue | MISSISSAUGA | Ont | L5E 1Z3 | 905-274-3177 |
| Stewart | Watson | 26, Juanita Drive | HAMILTON | Ont | L9C 2G3 | 905-385-8214 |
| Doug | Wilkins | 8448, Twenty Road | HAMILTON | Ont | L9B 1H7 | 905-679-4973 |
| Bill | Woodward | 520, Pine Street | Cambridge | Ont | N3H 2S6 | 519-653-4251 |

Correction Notice:

NAME:
ADDRESS:
CITY/TOWN:
POSTAL CODE:
PHONE:
e-mail: