Turn & Bank

OFFICIAL NEWSLETTER OF RAAC CHAPTER 85 March 2001

More on Norm Helmer's

Paradyne

Plus:

Keeping Your Cool

The Nature of Organizations

Inside

On The Cover:

A Mustang formerly owned by Jerry James. Above: I can dream, can't I? A Lancair IV at Arlington. Mark Munzel Photos

The TURN AND BANK is the monthly publication of RAAC Chapter 85 and is intended to keep members informed as to the club's activities, and to promote safety and technical excellence in the field of sport aviation. No responsibility or liability is assumed, expressed or implied as to the content of articles contained in the Turn and Bank: the intention is to provide a forum for discussion and exchange of ideas.

Newsletter contributions should be mailed to George Gregory, 19470-88th Avenue, Surrey, B.C. V4N 3G5 no later than the 12th of each month. Business Fax is (604)-469-3495. Please remember to indicate "attention George Gregory" on your fax.

Enquiries to the Membership Chairman should be mailed to Rob Prior, #204-130 E.11th St., North Vancouver, B.C. V7L-4R3

For inspections of Amateur Built Aircraft Projects contact the MDRA Inspection Services , ph. 1-877-419-2111 fax 1-519-457-0980 email: mdrainsp@on.aibn.com

Regular Meetings are held on the first Tues. of each month at 20:00 in the clubhouse:
Delta Airpark, 4103-104th Street Delta, B.C. Clubhouse phone: 596-3644

Mailing Address: Chapter 85, RAAC
c/o Delta Heritage Airpark, 4103-104th St., RR#3, Delta, B.C. V4K-3N3

Executive meetings are on the third Tues. of each month at 19:30 in the clubhouse.

Chapter aircraft pilots, mail cheques (Payable to RAAC Chapter 85) to:
Brad Short, 8052-122a Street.Surrey. B.C. V3W-7R4

RAAC National Homepage: http://www.inforamp.net/~raac
RAA Chapter 85 Homepage: http://home.istar.ca/~airframe/raa_85
Delta Heritage Air Park Homepage: http://home.istar.ca/~bb4
Source for CARS and Chapter 549 Airworthiness Manual:
http://www.aerotraining.com

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RAA
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Technical Guy

Tips from the Western Canada RVator

Peter Harrison's Rocket

Keeping Your Oil Cool
Eustace Bowbay, Blind Bay, BC
ebowbay@jetstream.net

The engine oil temperature on the Lycomings we are using is controlled by the thermostatic valve. This valve threads into the oil filter adapter; it looks like a heavy duty coil spring with a ball on the end (not a very good description). On the top of the valve it should have the temperature setting stamped into it. This is usually 85 C which converts into around 185 F.

From what I have been told, on a cold start oil pressures within the engine and cooler can be as high as 300 psi. This is not indicated on the oil pressure gauge due to where the reading is being taken from. As the engine warms up the spring in the vernatherm valve begins to expand, closing off the bypass and forcing more oil through the cooler to maintain the 185 F setting. I have found that this setting can vary five degrees or so either way.

If the oil temperature goes above say 190 F it is telling us that we have reached the limit of the cooler's ability to cool the oil, so cooler size and location becomes critical.

The approach I took to it was based on past experience. As there was no standard installation for the RV6 with an 0-360 that I was aware of I used some guide lines that I would be comfortable with, safety and reliability being the priority.

I chose to use the Stewart Warner model 8432 because it is one of the most proven coolers, with years of use, and I had seen it used on other certified installations and have been told it will pressure test up to 600 psi. The dimensions of the basic cooler are 3 1/2 inches thick, 5 1/2 x 8. With the two 90 degree fittings in the front it becomes 6 3/4 front to back. It is a 9-row cooler.

I installed it under the left front engine baffle with a 4 x 5 3/4 opening in the baffle, with the inlet and outlet fittings facing forward. There is ample room for it there. I didn't want to cut a hole in the back baffle and have the scat tube in the rear as associated with a firewall mounted installation and possible loss of cylinder cooling efficiency. On the other hand I wasn't sure what my installation would do to the cooling on #2 cylinder. I ran the cooler lines between the cylinders and the intake pipes to the accessory case.

The end result was a pleasant surprise. I use an "Insight Gem" graphic display for engine monitoring and my 0-360 is fuel injected. I have total control over my oil temps. Using 75% power for climb and 115-120 indicated the oil temp never exceeds 200, even at take-off temps as high as 95 F. By the time it reaches 195 to 200 you are in cool enough air and the power has dropped so that it returns to the thermo vale setting. In level flight at 65% it will maintain the basic setting flying in OAT as high as 100. Mounting in this location has no effect on the cooling of #2 cylinder, all four are basically the same. ***T&B***

BULLETIN BOARD

If you have questions or problems with your aircraft construction, we have members who have developed some expertise in various fields who have volunteered to advise you on methods, procedures and pitfalls in the capacity of **Builders' Counselors** something along the lines of the former designee programme. Please respect the fact that these are volunteers who may not appreciate late calls, and will not return long-distance calls on their answering machines. Also, none are inspectors, and although experienced in their various fields, cannot be held responsible. It is and remains **YOUR** project. Their names and numbers are on page two and will be a regular feature of our contents page.

Last I heard, Norm Helmer is looking for someone to help with his **Paradyne** project. The Paradyne is a cutting edge new concept in STOL aircraft that shows promise. If you're interested give him a call at 943-7887.

Dan Lawler would like you to send your email addresses to him at:

dan.lawler@kvaerner.com

He will create a database so he can send announcements about meeting programs, etc. Currently he has a list of about 20 e-mail addresses, and would like to expand it and keep it up to date.

Want to learn more about aircraft construction? Get involved in the J-5 project! Also, we are looking for help from someone knowlegable in fabric work. Talk to a member of the executive and they'll put you in contact with the right people.

Minutes

by Jim Hunter

Minutes of the General Meeting, 6 February, 2001

Call to order: 8:00 pm by President Tim Nicholas.

Walker/Munzer: that the minutes of the General Meeting of 2 January, 2001 be adopted as printed in the *Turn and Bank*. Correction: The grant received from Vancouver Remembrance Day Committee for the November 11 Fly-Past was in the amount of $625 and not $6250 as reported (sadly). Discussion *Carried*.

Correspondence: Letter received from Gogue at Canadian Museum of Flight thanking the Chapter for its donation of $200.

Committee Reports:

Treasury: Verbal report by Treasurer Don Souter. Members recollect that there is a sum of $6000 of Chapter funds that is on loan to DHAPCOM/GVRD. This is held as a float for fuel and other things that arrive COD.

Membership: Rob Prior: 141 total membership as of this night with renewals coming in at a good clip.

Buildings: Dan Weinkam/Dave Bell: Thanx to all who have paid up. Members wishing to be put on the priority list for a club hangar spot, see Dan. $50 refundable deposit puts you on his list.

Library: Tim Baker getting a grip on his new job. Says he has a few new useful handbooks and manuals. Get there fast before Tim himself gromms (? - ed.) onto them.

Vice President: Emily Clemens: Annual Bash to be April 21 at the Sundance Inn in Ladner - same place as last year. Members overwhelmingly choose beef over turkey.

Newsletter: Going fine says George Gregory. George would like to see a few items sent by our own members: hints, wrinkles et al. At present, he seems to be reprinting such from other people's newsletters! (with permission, of course - ed.)

RAAC: Rob Prior: Rob now the BC Mainland Director. Ken Gamble stepping down as RAAC President effective April. The first ever Cross Canada electronic Executive and Director's meeting to happen tomorrow.

Program: Dan Lawler: Tonight, marvelous talk by our good member Francois Leh on his several months back in Portage as a contract instructor training air force tads. Nice to see that everything is still done by the numbers whether it makes sense or not!

DHAPCOM: Terry Wilshire: 1) Drainage work map is planned. 2) Management Committee meets February 15, 7:00 pm - all are welcome. 3) per Bruce Prior: DHAPCOM sponsored fly-in set for June 30. Bruce has had good response from folk wanting to work on it. First meeting: next Tuesday, 7:30. 4) Back to Terry: talked again about the tentative 2003 celebration of the hundredth year of powered flight and plans so far. Still looking for people for this long term project. Talk to Terry.

Aircraft: Tedd McHenry: Turbi engine has been broken down and inspected. Needs new cam and risers, effectively a bottom end overhaul. Tedd has a quote.

McHenry/Wilshire: that the Chapter accept Valley Aero quote of $5076 parts and labour for this work. Discussion Carried.

Work should take 2 to 3 weeks then the engine can be trucked up to Sechelt, stuck on and the whole assembly flown home. Tedd Will negotiate further with Valley Aero to see if we can't have the cylinders honed.

Old Business: none.

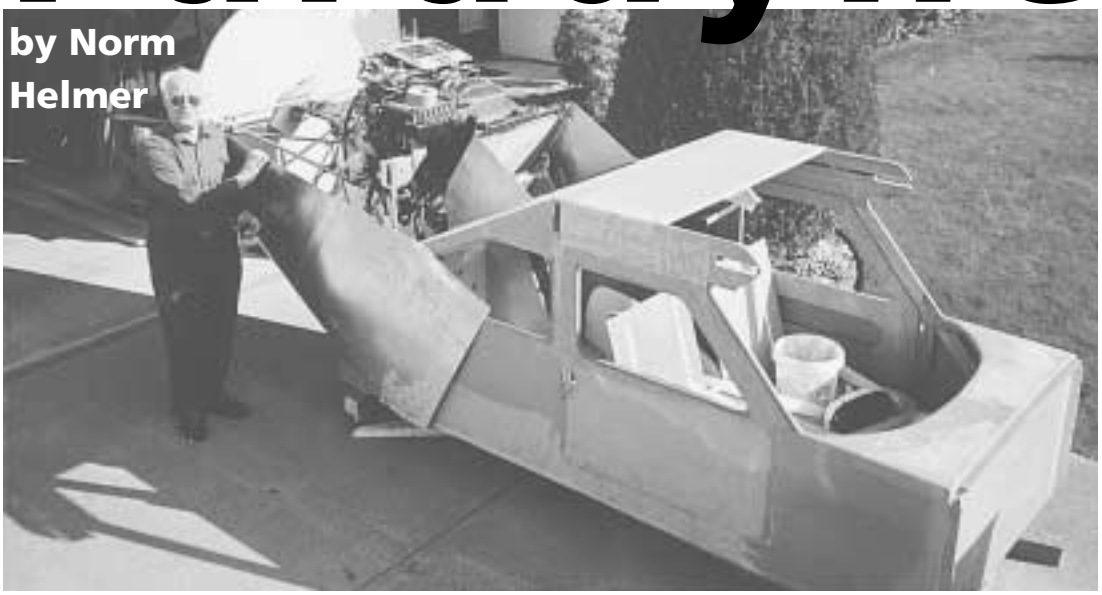
New Business: none.

Spence, Munzer: that we adjourn. Carried.

Jim Hunter, Secretary.

Paradyne

by Norm Helmer



A few years ago we ran an article on Norm's project, the Paradyne. Norm now expands on that article.

NOW KNOWN AS THE PARADYNE that owes its birth to a chance remark back in the late 50's by one of three hunters. "norm, you're always inventing things, why don't you invent a plane that we can tow behind a car, that will fly like a helicopter, then you could scout out the game and we wouldn't come home skunked all the time? Being a long time butterfly collector, I have often wondered just how did a butterfly fly and began thinking. "you would have to form a vacuum above the wing". But the butterfly has a low aspect ratio wing and does not have an airfoil. Like the bumblebee, the butterfly has been accepted by the aeronautical community as one of nature's phenomenal contradictions to the theory of flight. Studying butterfly wings under a microscope, I made an amazing discover, the scales you see on the top of the wing are actually on the bottom and are in fact air valves, the wing itself is actually a mesh-like structure of tiny squares openings joining tiny hollow tubes. The scales are constructed like a tiny folding fan, joined on the three leading sides to the meshlike structure which opens and closes like a clamshell, compressing the air above the wing and discharging it rearward, the world's original jet propulsion. Rub the scales off and the butterfly cannot fly. The fan folds in the scales give the scales strength and expandability. The trailing edge of the scales have a slight tab of protuberance which prevents the scales being pulled through the meshlike structure of the wing on the downstroke or lift cycle. This accounts for the undulating flight of a butterfly over an open field. The four wings are mounted on the thorax of the butterfly and the forewing controls the direction of flight, acting as both elevator and aileron and allowing 90 degree turns instantly: the ideal canard.

This study evolved as the "flying upside down teacup" as it was kiddingly called, which evolved to a flying fish type hydrofoil, which Boeing expressed interest in, to a dart like flying wing, which I tried to patent, to a scaled down version,l the Paradyne Aircraft, a ducted fan canard design which I started building in 1980 when I took early retirement. Construction stopped when I was rear-ended in 1984 and again in 1993 when I was rear ended again. Construction also stopped during Expo 86 when I helped build two aircraft and many times when I took my wife, Glady back to Toronto for treatment after she developed cancer. This plane is now under construction again in my double car garage, workshop with the assistance of John O'Neil, a very capable carpenter.

To understand the new concept in aviation we must first understand how a butterfly flies. As a butterfly has a low aspect wing and no airfoil it immediately defeats all the theories of flight. No scientist or aeronautical engineer I have ever asked has been able to explain this. However poring through a microscope onto butterfly wings years ago I came up with the answer. The scales on a butterfly's wings are actually tiny air-valves that open on the upstroke and close on the downstroke, which accounts for the butterflies undulating flight. The scales are like tiny folding fans, joined on the leading sides and top to a square membranous opening in the wing. The "tail" of the scale extends past the square opening preventing it from passing through on the downward or lift cycle. The pleated fan design gives the scale strength and expandability. When you are looking at the top of a butterfly's wing you are actually looking through tiny square openings seeing the tops of scales on the bottom. A photomicrograph of the top of the wing shows the scales appearing basically square, from the bottom they would be rectangular with little appendages added.

To design a plane that emulates butterfly flight you have to create a new concept in aerodynamics. To do this you would have to have a basic flying wing, circular or delta shaped with a central opening to suck the air from above the wing, mount the motor and propulsion unit below the wing, add a pilot pod and cargo and passenger compartment, a rudder mounted in the slipstream of the propeller, a trailing link landing gear which would prevent the plane from sitting on its propeller when the pilot and passengers depart and presto - you have a flying upside down teacup. The 1980 model of which is called a Paradyne and is under construction in my garage. Uniquely similar to the B2 Bomber.

How a butterfly flies. Copyright by N.C. Helmer

The flight of a butterfly is one of nature's greatest secrets and a source of admiration of the youngest child and the

Left: a model of the Paradyne.
Below: The author with the model displaying the ducted fan area of his invention.

world's greatest scientists. The gentle landing of a butterfly on a delicate flower, the undulating, almost poetic flight across a field, the migration of thousands of miles and thousands of butterflies to a central mating and hibernation spot where they can live for months seemingly without food or water. These are only a few of the wonders of one of nature's most beautiful creatures. Butterflies defy all of the rules of aeronautical engineering in that they do not appear to have any airfoil. When we look at the top of a butterfly's wing we are actually looking at the bottom, the top is a gossamer web that is transparent and supports a network of tiny scales that are actually tiny air valves that trap air on the upward stroke and release this air rearward to propel the butterfly forward. These same valves close on the downstroke to compress the air below and propel the butterfly upward. The downstroke creates a partial vacuum above the wing and the differential of air pressure literally sucks the butterfly upward. Simple, yes, but highly efficient. This explains the undulating flight across the fields, but how do they change directions so abruptly at the first hint of danger? They have four wings and the wings are arranged two to a side with each wing pivoting independent of the others to allow for the abrupt change of direction. The front wing is semi-supported at its trailing edge by the leading edge of the rear wing allowing a "bag" to be formed to trap the air above the wings more efficiently. The fluid which supports the transparent membranous portion of the wing absorbs ultraviolet light to harden the fluid, this also absorbs energy from the sun to allow the butterfly to make ling distance "solar powered" flight.

It is unfortunate that a butterfly uses the same airspace as an automobile in its migration and travels and the two compete. Travelling along a freeway in the midwest United States can put you in the path of a Butterfly migration. The edge of the road will be carpetted with dead and dying butterflies. The fool who speeds through such a migration will pay dearly for his speed in plugged radiators and oil coolers which could cost him the price of a new motor and a new transmission a few miles down the road. Travel cautiously when approaching a butterfly; they ca bounce off the windscreen of a slow moving car but it can be deadly to both the car and the butterfly if they are sucked into the radiator. Give the butterfly a "brake"; they have inherited the right to travel that route safely. If your car has a tendency to overheat check the front of your radiator for butterflies, then drive more cautiously.

The air valves on the bottom of the wings of a butterfly are supported at the top and sides by the transparent membrane and have semi-circular trailing edge which stops

the valve from going through the square opening in the membranous wing. The colouration of these valves or "scales" as they are more commonly called are in themselves a marvel of nature. Each is an entity in itself but each is also a replication of its parent. The bottom has pattern and colouration to allow the butterfly to blend in and in some cases to disappear into its surroundings. a prime example of this is the Dead Leaf Butterfly which literally disappears when it lands on a tree branch, becoming a part of the foliage. When found basking in the sun on its favourite plant a butterfly can be approached very cautiously but the second it is aware of your presence it will close its wings and blend in with the surroundings. One false move on your part and it will be gone in a powerful downsweep of its wings. ***T&B***

CLASSIFIED ADVERTISEMENTS

Classified Ads are free (within reason) to members. Display Ad rates are:
Business Card:$25 per year

1/4 page:	*$10/month*	*$100/yr*
1/2 page	*$15/month*	*$150/yr*
1 page:	$25/month	$250/yr

Ads that have been in for more than 6 months are subject to removal if space is required for other stuff. Please contact George the editor if you want it kept in.

FOR SALE: New 4130 Tubing - most sizes available. **Used** - Tripacer Fuselage (comes with logs), metal prop off 150 hp TRIPACER (comes with logs) Cessna spring steel gear legs, misc. wheels, axles, brakes and parts, misc. instruments (no altimeters!) A75 engine case, 7 Continental cylinders, some Lycoming cylinders (big), carbs, mags, pumps, old radios, etc. Call Pat at home, 533-1839.

WANTED: Medium size air compressor, with or without tank.
Doug 275-1405

FOR SALE:
52" x 34" Shettler's propeller with hub, $100.
Vic Gabas (604) 853-2778

FOR SALE: SIROCCO PROJECT
Fuselage, canopy, tail group complete. Air frame control components done except for cable. Main-wheel gear, wheels and brakes done. Tail-spring and wheel included. Panel made, no instruments. Lycoming 0-290 GPU Zero-timed. Will Neubert stainless cross-over exhaust with stainless muffler/shrouds. Bendix PSC5 carb. Bendix mags with non-shielded leads. no starter, starter ring or alternator. Weldtech engine mount. McCauley prop.
Wings: ribs and minor spars done. Spar diaphragms done. Two spar-grade spruce planks. No other wing parts.
$15,000 firm, complete and not interested in parting-out
Jim Hunter 576-2678

FOR SALE:
1 set (8) 60810 (68763) M10 main bearings $295 per set
1/2 set (4) of same $150 per set
1 set (8) 60810 (68763) M003 main bearings $295 per set
1 set (8) 61662 M10 Rod Bearings $175 per set.
All bearings fit Lycoming 0-235 and 0-290 (without C/S prop). All are new, perfect but certs mislaid,
Gogi (604) 823-6428

FOR SALE:
1957 Tripacer Wings uncovered, all reworked. New leading edge. New ash tip. All Zinc Chromate ready to fabric. Included: 2-18 gal. gas tank, 2 - gas tank cover, landing light, aileron and flap, front and rear struts. Asking $4000 Canadian.
Roger Gauthier (Kelowna) (250)-763-1529
(250) 212-0832 (cel)

WANTED: PA 18 or PA 20/22 Wings. Some damage OK. 946-5881

FOR SALE: Electronic Tach 2.25" with generator (new) $125, 6" castoring tailwheel, $50, Electronic dimmer control, $25, 2 New 600.6 Goodyear Tires, $125 for pair, Combo EGT/CHT (needs probes),$50, Tach Cont.C85-0200, $35, Temp (OAT) gauge, new, $35, Windscreen Ant., Van's, new,$15, 525 battery (new) never had electrolyte, $75, Fuel Pressure Gauge O/H, $35, Lycoming Starter 0-290, 0235, 0320, 0360, for $375.
Bob Cutting 275-1603

FOR SALE: Fleet F7 Biplane replica. Very close to original copy except for uncowled engine. Engine: Kinner R55 160 hp. Aircraft is modified for solo operation from rear cockpit. Extra bellytank with wobble pump. Original Fleet wheels, brakes, pedals and stick column. Original parachute accommodating bucket seats, oversize tires, Stits covering, voice activated intercom. Ted Hendrickson Propeller, manual and extra key magswitch.
$35,000 Canadian. (604) 478-6048

Classified continued on page 8

Will consider small antique aircraft engine as trade-in.

Aircraft Painting

Will paint, finish off aircraft for cash or part share in airplane. Prefer Cessna or Piper. Value of work is $6-8000 depending on condition of aircraft.

Kevin 580-6264

FOR SALE: One set of 1500 Murphy floats ready to go.

Ole #45-3931 198 st. Langley BC 514-1280

FOR SALE: 6 Factory new Franklin 180 hp cylinders includes installed valves $300 each, will not part out.

Tim Novak 271-8586

FOR SALE: Softcom 2 place Intercom ATC-2Y, with accessories $110.

Stuart Gear (604) 941-9402
E-mail:sgear@infoserve.net

FOR SALE:

ELT: ACK E-01, meets TSO c91 - A, complete with external antenna kit and remote panel $225.

David Clark Headsets $225 (mostly 10-30 type, helicopter and airplane.

Telex PT-300 PTT $30.

Full map GPS Garmin 195 - Nicad pack, Pacific NW map chip, PC/MAC computer cable kit, mounting bracket. $1500 or $1200 without map data chip.

Bendix RSA 10 ED1 Injector Body, no history, $400. Woodward Prop Governor #210681, no history, $400.

National 360 Parachute, blue with matching carry bag $900

Christen 5 point aerobatic seat belt harness, with 2-point Military 3" belt $350

Guido 948-3464 e-mail: glepore@direct.ca

FOR SALE: 4130 Annealed Gauge Plate now in stock, .025 to .375. We will sell you the plate or laser cut the parts

Industrial Laser Cutting ltd.
(604) 946-4152, Fax: (604) 946-4153
E-mail: tmw@industriallaser.com

FOR SALE: 1- Miller 200 amp AC/DC H.F. Tig/stick welding machine - 220V 1 ph. $1200. 1- Miller 120 amp MIG (wire) welding machine, 110 volt. Portable sheet metal type, c/w gas kit (almost new) - $800.

Pat O'Donnell 533-1839

FOR SALE: Zenith 250 plans and parts, wing rib moulds $360. Christavia Mk IV project, 4130 steel tube, wing ribs, flaps ailerons, gear legs, wheels and brakes, tail stab and rudder, $3600.

Paul Trudel 532-8570

BUILDING PARTNER WANTED:

partially completed Kitfox Model IV-1200. Time too limited to complete myself. Seeking building partner with some experience. Partnership arrangement - terms to be discussed.

Call Marty Billinkoff

Days (604) 322-7545 Cell (604) 351-0222
Evenings (604) 946-6475
email: martyb888@aol.com

LAST WORD

GEORGE GREGORY

ORGANIZATIONS, especially ones comprised mainly of volunteers, exist by a law, a principal of critical mass. When this point is reached, a sort of inertia develops and it assumes a life of its own. Programs are adequately staffed, the constituents of the organization have their needs met, and energy can be expended in growing and reaching out to other potential members.

There is a terrible converse to this. If a group drifts *below* this point, the remaining workers face a progressively heavier load; as they burn out, the group they are trying to serve suffers reduced service, and people start to drop off, accelerating the process until the endeavor fails completely.

What causes a group to arrive at this point? What can we do to prevent it?

In my opinion, the most damaging and dangerous force is that of division. Personality clashes, regionalism, political agendas within the group all promote this destructive energy. It is said that the whole is greater than the sum of the parts; conversely, when the whole is broken up into smaller bits, their collective power is lost, and what remains is more subject to decay. Effort is duplicated unnecessarily, people are worn out sooner, and many just throw up their hands and give up.

So: firstly, *leadership that is able to bring together disparate interests and create a unity*. This leadership must not be afraid to delegate, and must not frustrate those appointed to do certain tasks; if given responsibility, they must also be granted the authority to act on behalf of the group.

Second: this leader must also recognizes the importance and expertise of each member and trusts them to do their task; listens to those "on the ground", the ones that face the realities of the situation on a daily basis. He or she manages these people the way a maestro conducts an orchestra. The leader must not "micro-manage".

Thirdly, the organization must be as *all-encompassing as possible*, with the largest possible constituency. This not only gives it more clout with politicians, but as groups are brought under the umbrella, more organizational efficiencies are realized. There is no room for pride or turf wars here.

Thirdly: *leadership must be visionary and inspirational.* It needs to see where we have been, where we are going, and aware of trends and possibilities, and desire to exploit these while leading towards a definite goal. The leader needs to be able to inspire others with this vision, to explain and to motivate.

Steve Jobs and Bill Gates are probably two of the most significant figures in western society. Their importance stems not from technical prowess, but rather from the fact that they saw what personal computers could do if they were put in the hands of ordinary people. They had a vision, and it drove them.

Fourthly: *the group spreads the work around*. Tasks are shared by as many as possible, reducing the load on long-serving members. There is a rotation not just of that special 20 percent that always seems to be involved, but by the group as a whole.

We will not get anywhere by just holding the line. Much good has been done already by dedicated people within flying organizations of all sorts. We need to do more.

Are you one that has an ability we could benefit from? Come on board! There is much untapped talent within our numbers. We just can't afford to sit back. Write an article (don't be shy), get on the executive, help at the field, mentor a first time builder. And to those already at work: keep it up. You are more appreciated than you know. ***T&B***