



NEWSLETTER

Carb Heat

Hot Air and Flying Rumours

Vol 27 No. 6

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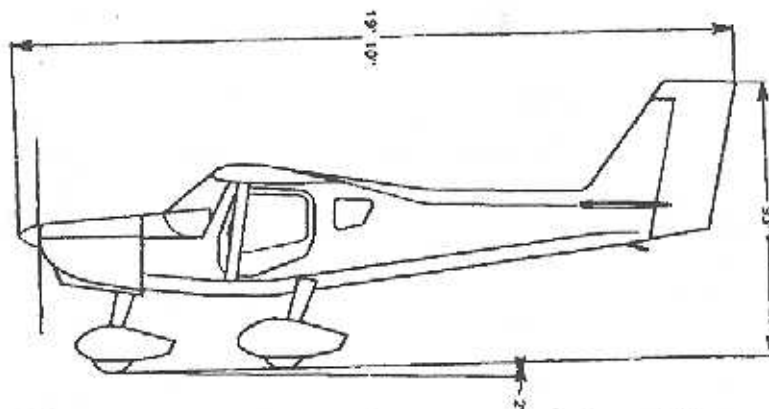
>>>>> Next Meeting: **Saturday 21st June** <<<<<

>>> 1000 hrs <<<

Chapter Hangar

Program: Regular monthly business

Inside: Presidents Page by Gary Palmer
Lycoming (part 2) by Paul Bertorelli and Mike Busch
Ultravia by Barney DeSchneider
July 1st NAM demo by Martin Poettcker



*Pelikan demo at Meeting
at Carb 21 June*

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Spring was short lived as we seemed to move almost directly from winter to summer. By the time you read this we will have the Young Eagles day behind us, and will be well into the fly-in season. We still have two more major upcoming events for the summer.

July 1st @ NAM

Our annual contribution to the Canada Day celebrations at the National Aviation Museum continues this year. As in past years we will have a static and flying aircraft display; if you want to exhibit your aircraft please contact either myself or Luc DeSadeleer. In addition we will have an indoor information table manned by **Martin Pottecker and Curtis Hillier** (Thanks for volunteering guys). Martin is looking for some assistance, so please contact him @ 592-1403.

Aug. 9/10 Fly-in Bkfst

Our annual fly-in breakfast is scheduled for Sunday August 10th with Saturday Aug. 9th as the setup day. If you haven't already volunteered, please contact **Barnie de Schneider @ 225-6003**.

Cleanup May 31st

Our annual spring cleaning was a big success and the dedicated band of volunteers who showed up enjoyed a great barbecue lunch, courtesy of **Wally Bielinski**. Now that we have cleaned things up, I encourage everyone to keep things clean so the task next year is simplified and we can focus on improvements more than cleanup. A hearty round of thanks to all who participated! If your aircraft is based with us and you weren't there, I trust you will do double duty on the

grass cutting front to compensate.

Carp Airport Status

The situation remains unchanged with the region still undecided on how they want to manage the airport. The WCAA contract has been extended for another two months, and the AGM is scheduled for June 19th, so hopefully I will have something new to report at the next meeting

May highlights

Our May 15th visit to the NTSB facility at Uplands was an outstanding success. We really are extremely fortunate to be based in Ottawa and close to so many first class aeronautical establishments. Two key items stood out in my mind. The feedback on Les Staple's accident (see later) from **Elaine Summers** was very timely. The re-creation of an East German Airbus excursion into the realm of aerobatic flight in IMC via the flight data recorder visualization software developed by the NTSB, was awesome. At times both frightening and hilarious. You really had to be there to believe it. A special thanks are due to our hosts at the NTSB.

Newsletter Editor

As noted earlier, **Andy Douma** is stepping down after several years of stalwart service. I am very pleased to announce that **Charles Gregoire** has stepped forth and volunteered to follow in Andy's footsteps. I trust you will all give Charles as much, and hopefully more support than Andy has enjoyed. It is particularly rewarding to see such a key position filled by a willing volunteer rather than the usual conscript.

Maranda Accident

Les Staples experienced a serious accident in his Maranda on Thursday evening May 8th. Les and his lovely wife Amy had departed NORDO in the early evening of a perfect day for a pleasure flight on one of the first good days of spring.

At takeoff, and throughout the evening, the winds were light and variable from the east, favouring runway 10. On return to the airport, Les expected 10 to still be the active, checked visually for any conflicting traffic, and observing none, set up for final approach to 10.

After an uneventful touchdown, Les noticed a high wing Cessna on short final which showed no sign of recognition of his presence on the runway. With no shoulder on the side of the runway available to leave space for the arriving aircraft that was landing into a setting sun, Les was left with no alternative but to take off and take evasive action to avoid a potential collision. As Les banked steeply right, and then again left to set up for downwind to runway 28, the almost zero time O-300 suddenly quit dead at 300 ft. altitude. Les had no time to restart, but did establish a best glide attitude before impacting the trees on the downwind side of runway 28.

The aircraft came to rest in a 30 degree nose down position with the right wing torn free, but fortunately the cabin area fully intact. Fortunately, there was no post impact fire, and Les was able to quickly extricate himself, and help his seriously injured wife out of the wreckage. Within 5 minutes or so rescuers were on the scene, and Amy

was airlifted out by the Huisson Medevac chopper, with a broken Sternum, collarbone, and ribs. Les escaped with minor cuts and bruises, plus a minor hip injury.

The initial speculation on cause was that the left fuel tank with some 19 litres of fuel became unported during the steep turns, causing the engine to quit. The Maranda uses a "left/Right" fuel selector valve with no intervening header tank or "Both" position. Subsequent analysis by the NTSB however, uncovered a different probable cause.

Dis-assembly of the carburetor showed an internal screen was clogged with organic material like grass. This can result in fuel starvation, hence engine stoppage. Les recalls that last year he had removed some birds nests from the cowl area, and the grass probably made its way into the system through the air intake to the carb heat system during operation with Carb heat on. Les can't recall if he went to carb heat cold on the emergency takeoff, but postulates he didn't and this was what sucked the fatal last blade of grass into the carburetor, causing stoppage.

The key lesson here is that **many aircraft, including the Cessna 150's I looked at on the field, do not have any form of filter screen over their carb heat air inlets, and are susceptible to the same potential type of failure!** As Tony Bingellis cautions, all air inlets should have a simple screen to keep bugs and large debris out of the system. Better still is a system such as that used on RV-6s that keeps the Air Filter in the loop for both carb heat cold and hot

operation. Of course it goes without saying that an air filter should be considered mandatory on all homebuilt aircraft. Some U.S. based designers, don't consider them necessary, I recall Lancair omitting this item in their early plans.

A second major concern was the lack of any usable shoulder area on the new runway, a **design and specification flaw that Carp shares with the Cornwall and other airports.** Despite repeated efforts by the WCAA and the Carp tenants to get the regional engineering staff to reconsider their design, we are stuck with ditches immediately adjacent to the runway. Consequently what should have been a non event, became a **serious accident**, and very easily could have been a tragic accident costing at least three lives. Particularly disconcerting is the hands off attitude taken by Transport Canada when asked to clarify the intent of the specification to the regional engineering staff. Apparently the intent was to say **"ditches must be no closer than 22 metres from centre line or 7 metres from edge of pavement"** but this was interpreted as **"ditches should be 7 metres" from the edge of the runway"**. The justification of the engineering staff seems to be based solely on efficient drainage with scant concern for safety. To add insult to injury, the pre-existing storm sewers, which were in perfect condition, were removed in favour of ditches.

Operations during light and variable wind conditions are particularly conducive to these potential opposite direction conflicts at uncontrolled

airports. In this case, the pilot of the Cessna chose to land into a setting sun which severely impairs his ability to spot potential conflicting traffic. It is all too common to see this happen, particularly with students afraid to make a switch without the intervention of a higher authority. In some cases flight training operations use the runway that is closest and most convenient, often accepting a tailwind. Unfortunately Unicom operation is generally on a best efforts basis. The bottom line is **stay particularly alert in light and variable conditions.** Remember the **onus is on the landing aircraft to give way to any craft on the active runway and go around.** Unfortunately, the pilot of the Cessna in this case is unknown.

Accidents such as this also point out the value of equipping all aircraft with a radio, even a handheld wherever possible. Les had a handheld, but he hadn't completed inter-connection to his intercom system at the time of the accident.

June 21st Mtg.

The next meeting is being held **Saturday, June 21st at the Carp chapter hanger, 10:00 AM.** We are expecting to have a **Pelican Club** on display courtesy of Ultravia, as well as our annual first flight recognition reward(s). This year we congratulate **Andrew DePippo** for completion of his Zenair CH-701. Hope to see you there!



Fly safely.....Gary

Ultravia's Pelican Line of Aircraft

Barney de Schneider

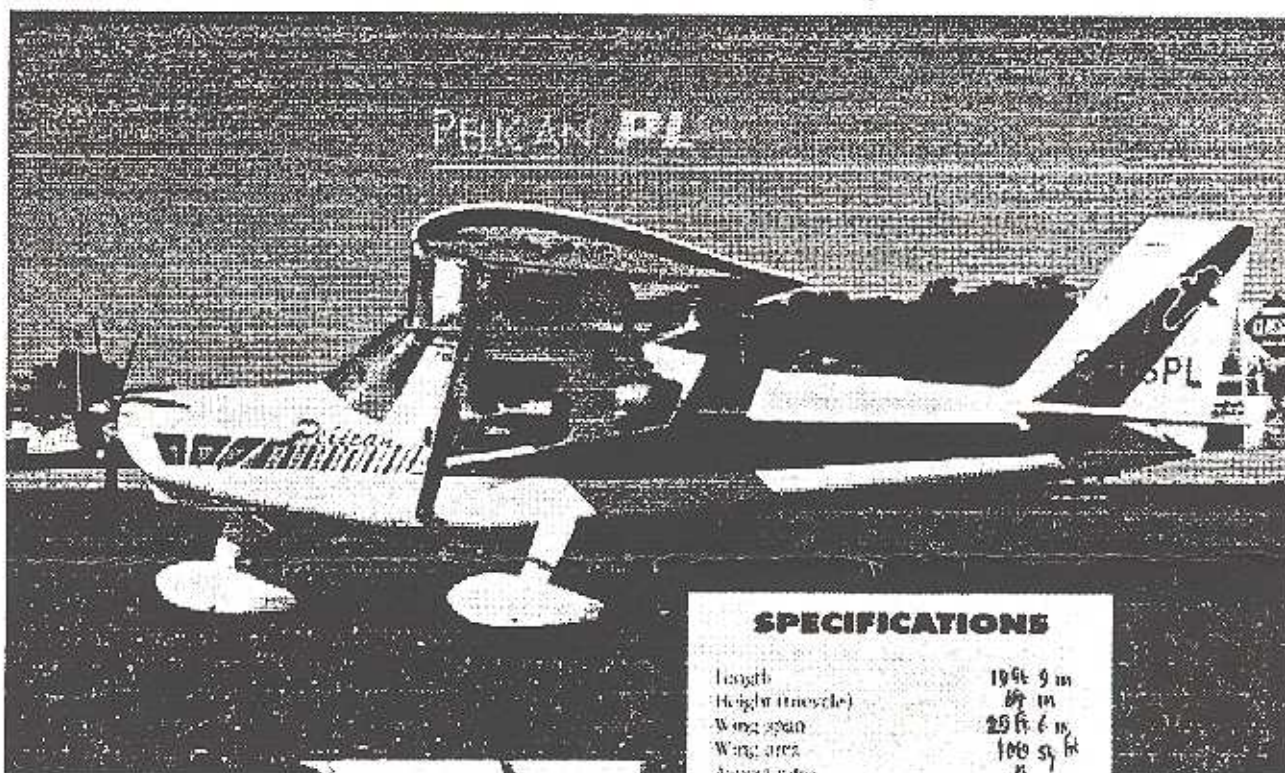
LOCATION: Carp Airport, our hangar

DATE: Saturday, June 21st

TIME: 10:00 - noon

Please note the change to date and location for our June meeting. This month we are fortunate to have Norm White of Ultravia Aero International as our guest speaker. Weather permitting, Norm will be flying in one of their Pelican aircraft so that we can see as well as hear about their versatile and proven line of kit planes.

Ultravia Aero International is located in Mascouche, Quebec, just north of Montreal. The company, I believe, started out building ultralight aircraft and evolved into a manufacturer of composite kit aircraft that are now flying in many countries around the world. Some of you may remember reading in *Canadian Flight*, in late 1991, that a French pilot had flown a Rotax 912 powered Pelican across the Atlantic Ocean to Biarritz, France in June, 1991. Since that feat, the company has continued to improve on this very successful design. Come on out on the 21st and see for yourself.



The Pelican PL is an

STYLISH 7-place, fast build, fuselage with composite fuselage and metal wings.

TOUGH the Pelican PL is especially for flight training and optimized for sport flying.



SPECIFICATIONS

Length	19ft 9 in
Height (nose)	8ft 11 in
Wing span	29ft 6 in
Wing area	100 sq ft
Aspect ratio	8
Cabin width, at hips	41 in
Cabin width, at elbows	42 in
Headroom	11 in
Structural gross weight	1600 lb
Empty weight	750 lb
Baggage capacity	75 lb
C Fueling (fuel)	44 / -2
Minimum safety factor	1.5

Canada Day Celebrations at the National Aviation Museum

Martin Poettcker

On July 1st, the National Aviation Museum will be joining the Canada Day Celebrations by opening their doors to the public free of charge. I talked to Ed Patton at the museum, who described some of the activities to me. Included are a flyby/show by the snowbirds at 11:45 AM, a parachute drop, a show by the Stetson flyers, and a demo by a SAR helicopter. The Snowbird pilots will be coming back to the museum to sign autographs after their show. In addition to the activities in the air, the museum will have singers, clowns and face painters on site to entertain the public, and even the Armed Forces Marching Band! Sounds like a great agenda.

The EAA will be on site again this year, and Ed has agreed to provide us with a table and a tripod inside the building along the Walkway of Time, as well as space in the north compound for homebuilt aircraft. Pilots can fly in to the Rockcliffe Flying Club and take the taxiway to the Museum. Museum staff will be on hand to open the 60 foot gate and guide traffic to the proper area. Rope barriers will be provided to keep the planes safe, although pilots are expected to stay with (or close to) their aircraft. The Museum will open to the public at 9:00 AM, so pilots are requested to fly in before then. After the NOTAM expires (around 14:00 hrs) pilots can do some flybys to show the public that homebuilts really do fly.

At the table inside, we will have some promotional literature and posters from the EAA, membership application forms (of course!), copies of our newsletter so the public can see the kind of information provided at our chapter meetings, some pictures of the hanger at Carp, and photoalbums of homebuilt aircraft, along with copies of Sport Aviation and the US Aviator's Sportplane resource guide. We will also bring in some copies of homebuilt plans to give those interested some idea of the kind of information available when building. If you have some homebuilt plans that you would like to provide to increase our variety, or a photoalbum of your project, please either bring them to the June meeting at Carp, or let me know you have them so I can arrange to pick them up. Ed Patton also told me that the workshop area would be open, and that space would be available if someone wanted to bring their partially complete project to put on display. This has been done in the past and has generated quite a lot of interest. Let me know if you are willing to do this and I can help with the details and setup.

We are also looking for volunteers to help staff the tables and answer questions about the EAA, and perhaps to spell the pilots outside for a while. If you will be in town on July 1st and can help, even if only for an hour or two, please sign up at the June meeting, or phone Martin Poettcker at 592 1403. All volunteers will get a free lunch provided by the Museum, and the Museum will have the outdoor areas open with several of the planes accessible for walkthroughs, so there will be lots to hold your interest. The Museum will close at 4:00 PM.

Future of the piston aircraft engine... A Visit to Lycoming

With Cessna back in the new piston airplane business, Lycoming should soon be top dog of the OEM engine market. But while they're busy gearing up for Cessna, the company still plans to expand its overhaul and parts business. This originally appeared in *The Aviation Consumer*.

by Paul Bertorelli and Mike Busch.

Part 2

The Quality Issue

For all its benefits, outsourcing has its problems. If the vendors aren't competent the quality will suffer and if they aren't reliable, the parts won't arrive on time. Lycoming

admits that this has been a problem in the past, if only in terms of the sheer volume of vendors.

Engineer Rick Moffett told us that as recently as a year ago, the company was dealing with some 300 vendors; 80 companies alone supplied fasteners and hardware. By this summer, the vendor list had been winnowed to 130 and eventually, most of Lycoming's outside work and parts will be supplied by fewer than 100 companies.

Quality control is one reason for this. At Continental, we saw a QC program built on periodic inspections of each process and part and Lycoming does the same, at least for now. They hope to rapidly move toward a system of certified vendors, whereby companies supplying the parts demonstrate they can produce quality work and inspect parts in their own plants before shipping them.

"It makes no sense to inspect parts over and over," says Moffett. "It just adds cost, but no value." Instead, he says, "At some point, a vendor's quality is at the point where we wouldn't catch any problems unless we inspected every part." On the engine assembly line itself, Lycoming operates two distinct lines, one for new engines and one for remans and overhauls. Exchange overhauls are done in the factory while customer overhauls are completed in a small shop at the Williamsport Airport. This is in contrast to Continental, where all the engines move down the same line, differentiated only by the color of the serial number plate. (Continental doesn't offer factory overhauls, just remans.) At various points in the Lycoming assembly process, each engine is inspected for critical items such as cylinder-bolt or rod-bolt torque, for example.

As does Continental, Lycoming performs an instrumented test-cell run on every engine and documents the results. It also disassembles every 20th engine of each type after the test cell run to inspect for damage or unusual wear. (Continental strips every 25th engine. There's no particular magic in either number, it's just the inspection procedure the FAA happened to have approved for each factory.)

At Continental, we were shown detailed manuals that list standardized assembly procedures for each engine as it moves down the line. Slowly, these assembly manuals are being tied into computer tracking systems. By comparison, Lycoming is just beginning to develop this sort of computerized documentation, although each engine is accompanied down the line by inspection sheets that ultimately form a paper trail of its history.

Curiously, although we have to say Continental's QC systems appear to be more state-of-the-art, we receive far fewer complaints of poor quality slipping through the cracks at Lycoming. In our informal surveys of engine shops and from letters we receive from owners and operators, Lycoming seems to earn acceptable although not perfect grades for quality. What complaints we do hear often concern lagging parts shipments and, from field overhaul shops, high prices on engine parts that make it difficult for them to compete

with the factory's economics. Indeed, at one engine shop we visited, almost the entire stockroom was filled with boxes from Superior Air Parts, the leading supplier of aftermarket engine components and Lycoming's chief competition. Without Superior and other PMA houses, say many field shops, Lycoming would have little incentive to price its engines and parts competitively.

Getting the Business

But Lycoming does have the competition and having watched its new engine business dwindle, the company has filled the void by going after the bread and butter of the field overhaul shops.

"In 1976, we didn't really sell engines," says Peter Bates, who handles international marketing, "if you wanted an engine, you knew where to find us."

All that's changed, of course. Until Cessna ramps up (and assuming it really meets its projected sales volumes), 70 percent of Lycoming's dollar output is either parts or remanufactured/overhauled engines. Despite the Cessna orders, we expect Lycoming will continue to go after the replacement market.

"Right now," says Boob, "the competition is fierce and the margins tend not to be what we would like. But if we get our cost structure in line--and we have been doing that--then there's no reason that we shouldn't own a minimum of 60 to 75 percent of that worldwide market."

When Lycoming first got into the overhaul business, its prices didn't lure much business away from traditional overhaul shops. As both Lycoming and Continental have lowered their costs and learned to live by thinner margins and with Lycoming offering factory overhauls, marginal field shops have been driven out of the business and those that remain are finding a tougher go of it.

On many engines, overhaul shops can still undersell the factory, but the price spread is less than it used to be and factory engines always include new cylinders, a significant incentive for some customers.

In 1992, Lycoming essentially cut the cost of its cylinder kits by half on the most popular engines. This development didn't kill the re-conditioned cylinder market overnight, but it surely eased the pain of equipping an overhaul with new jugs instead of reconditioning the old ones. It also made factory overhauls yet more competitive.

The factory had always been at a disadvantage in service and engine delivery times. With five to eight week lead times common, field overhaul shops are bad enough but until recently, Lycoming had trouble matching even those schedules. Now, the factory has put in place a four-tiered delivery schedule, such that engines for popular airplanes--an IO-360 for a Mooney, for example--are kept "inflow" and can supposedly be shipped within two weeks on an exchange basis. Few field shops can match that.

Although delivering an overhaul or reman in two weeks sounds like a trivial accomplishment, Moffett says it took a fundamental reshaping of factory culture that's still ongoing. "Being good at building new engines doesn't mean you're worth a damn at overhauls," he says. In days of yore, when volumes were high, the plant would inventory parts for each engine. But because Lycoming builds so many variants of only five engine families (more than 600), the process was wasteful of time and money. Worse, if an engine assembler ran out of cranks or some other part, work would halt until a new run of parts could be made.

Now, Lycoming uses a variation of the "just-in-time" inventory method pioneered by Japanese auto plants. Inventories of major parts are tracked by demand and then advanced through manufacturing only to the point where commonality with other engines in the family ends. The O-320, for example, used to require six basic crankshafts in 29 variations, the differentiation amounting to a hole bored here instead of there. Now, says Moffett, there are three basic cranks and finish work on the part doesn't happen until just before it's due to go into the engine, thus the plant ties up less money in inventory but can still meet short delivery schedules.

More of the Same

Another stark contrast between Lycoming and Continental is the corporate attitude toward innovation and risk. Continental touts itself as a high-technology engine company, with hopes that its clean-sheet designs will lead the way to the future. Lycoming, on the other hand, is obsessive about retaining what works, making tweaks in production processes and, above all, avoiding disastrous service problems that alienate customers and strain the warranty budget. Some complain that Lycoming is too conservative and waits too long to correct design or production flaws. In recent history, one of Lycoming's more painful forays into innovation was the O-320-H2AD engine that powered the Cessna 172 from 1977 to 1980. The engine was supposedly an improved variant of what had been a virtually bulletproof powerplant for Cessna. More important, it gave Lycoming an opportunity to tailor the engine to its new automated crankcase line.

The engine proved to be an embarrassment for both Lycoming and Cessna. It suffered premature camshaft and valve train wear, not to mention failures due to sheared oil pump drives. Lycoming eventually cured the H-engine's ills, but the experience reinforced the company's instincts to stick with the tried and true.

Still, that didn't stop Lycoming from teaming with John Deere in the mid-1980s to build a revolutionary new aircraft rotary engine. After sinking millions into the project, neither Deere nor Lycoming found any takers. Well, actually, they found one.

"I was vice-president of sales at the time," recalls Phil Boob. "We found just one airframe manufacturer willing to sign a

memorandum of understanding to go forward with that engine. That was Cessna. They signed the memorandum on Monday and made the announcement on Friday that they were getting out of the light airplane business."

In Boob's mind, the current market—probably even a revitalized market—isn't demanding nor will it support revolutionary engine designs.

"If all I'm doing is replacing engines that I'm selling anyway, how does it make sense to develop new engines? Now if you could increase the market, or increase the total number of units you could sell, or you could get more per engine, obviously, it starts to make some sense. But if I'm going to replace a 540 with a rotary at the same numbers, why am I going to do it? Why would anyone do it?"

That's not to say Lycoming won't improve its engines incrementally. It plans to make available the new Slick LASAR electronic ignition system and doubtless numerous other minor improvements. But if you're looking for a new-age powerplant with 400 horsepower and .30 fuel specifics, it won't come from Williamsport.

Conclusion

Of all the companies we've visited recently, Lycoming seems the best positioned to benefit from any GA recovery. With Cessna's restart on the horizon, Lycoming won't need much investment to service what could be a huge inflow of business. Even if Cessna fizzles, Lycoming appears to be in a superb position to grab more of the overhaul and reman market. Although Lycoming's customer service network is not yet as sophisticated as Continental's—its plans for computer on-line access to maintenance data are a year or more away—the company has added service reps in the field and doubled the number of people available to help customers over the phone. And despite complaints, Lycoming doesn't suffer the bad quality rep that seems to perpetually dog Continental. We see this as generally positive news for aircraft owners and operators, although we have some concerns that if predatory pricing drives too many field shops out of business, lack of competition will cause engine prices to spiral upward again and service quality may decline. Given the health of the PMA industry, however, that seems unlikely to happen in the near term future. —

Gearing Up For Cessna

In the old days, a major new order for powerplants meant the factory would staff up, add shifts and go at the job hammer and tong. Not anymore. Although it has hired on some additional engineering help, Lycoming will fill Cessna's orders mostly with the workers it already has, with outside companies building the parts and pieces. Despite the fact that the 172, 182 and 206 will be getting engines they've never had before, Lycoming will stick to its corporate philosophy of using only the tried and true, or at least as much of it as the customer will accept.

The parallel-valve IO-360 to be used in the Cessna 172, for example, is virtually the same engine used in the Cutlass RG, although it will have fuel injection instead of a carburetor, ostensibly to reduce the likelihood of carburetor ice. At this point, it looks like Slick's LASAR electronic ignition system will be an option on this engine, but not necessarily standard. (It hasn't been certified yet.)

When we visited the plant last winter, no one at Lycoming thought Cessna would drop the Continental IO-520 in favor of a Lycoming engine but that's exactly what happened. Cessna asked Lycoming for a 300-plus HP bed-mounted engine for the 206 and Lycoming proposed a new model called the IO-580. But even this engine is new only by degree.

The power section (crankcase, crankshaft, rods, cam) will be essentially the same as that used in the 540-series engines, with the additional displacement coming from boring of standard 540 cylinders. The heads will be retreads, too, having been used on the TIO-540-V2BD used in the Piper

Mojave 15 years ago. That engine had less than a stellar service history but its problems weren't related to heads and cylinders. The IO-580 will have 310 HP and a turbocharged version-using a new model Garrett turbocharger-is in the works.

The biggest difference may be in external appearance. The IO-580 will have top-mounted induction and a bottom-mounted exhaust, whereas Lycoming has generally located the intake plumbing on the bottom of the engine.

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<<===== **On the Horizon** =====>>
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 <<===== >>

courtesy of Tom Smith

Date	Day	Time	Event	Location
June 21	Sat	1000hrs	EAA 245 meeting	Carp Airport
June 22	Sun		EAA MASSENA BREAKFAST CUSTOMS ON FIELD(MUST)	
June 19-22	Thu-Sun		SUMMERSIDE PEI-COPA Convention	
June 28-30	Sat		SHERBROOKE Flymarket	
June 28-30	Sat		GORE BAY BREAKFAST & MORE !!	
June 29	Sun		Brockville Breakfast	
July 1	Tue		EAA display at National Aviation Museum, Rockcliffe	
July.1	Tue		ROCKCLIFFE BREAKFAST	
July.1	Tue	1930hrs	EMBRUN AERO CLUB MEETING (T.Smith)	
July.9	Wed	1930hrs	RAA meeting KINGSTON	
July.15	Tue	1930hrs	RAA meeting SMITHSFALLS	
July. 5	Sat		IROQUOIS BARBECUE ICOA	
July. 6	Sun		ARNPRIOR BREAKFAST	
July.17	Thu	1930hrs	EAA meeting ROCKCLIFFE MUSEUM	
July.20	Sun		IROQUOIS BREAKFAST (& CAMP OVER SAT.NIGHT)	
July.27	Sun		GATINEAU BREAKFAST	
July.30- Aug.5			OSHKOSH	

Aug. 7	Thu	19:30hrs	EMBRUN AERO CLUB MEETING (T.Smith)
Aug. 5	Tue	19:30hrs	RAA meeting KARS
Aug. 10	Sun		EAA245 CARP BREAKFAST
Aug. 13	Wed	19:30hrs	RAA meeting KINGSTON
Aug. 17	Sun		ALEXANDRIA-Breakfast
Aug. 19	Tue	19:30hrs	RAA meeting SMITHSFALLS

Classifieds

11 June 1997

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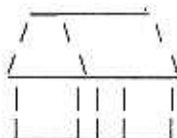
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Sharon and Rodney Stead



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Editor *Carl Heat*



**EAA Chapter 245 Membership
Application**

NEW: ___ RENEWAL: ___ DATE: ___/___/___

EAA NUMBER:.....

EXP Date: ___/___/___

NAME:.....

ADDRESS:.....

CITY/TOWN:.....

PROV:.....PC:.....

PHONE:(.....).....H (.....).....W

AIRCRAFT &

REGISTRATION:.....

OTHER AVIATION AFFILIATIONS:

COPA: ___ RAAC: ___

OTHER: _____

Annual Dues: January 1st to December 31st. (ported after March 31st for new members/subscribers).

Associate Member ___: \$30.00 Newsletter plus Chapter facilities

Full Member: ___: \$55.00 Newsletter, hangar, workshop, tie-downs

Newsletter subscriber ___: \$30.00 Newsletter

Note Associate and full members must also be members of EAA's parent body in Oshkosh WI, USA

Make cheque payable to:

EAA Chapter 245 (Ottawa)

Mail to - P.O. Box 24149, 300 Eagleson Road, Kanata, Ontario, K2M 2C3