

EAA - MILE HIGH CHAPTER 43

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NOTAM! NOTAM! NOTAM! NOTAM! NOTAM! NOTAM! NOTAM! NOTAM! **Our Next Meeting:**

The next regular Chapter 43 meeting will take place at 7:00 P.M. on October 12th, at the Colorado Aero Tech facility. Meeting to be held in the hanger area. This is our annual auction night. Bring aircraft stuff.

Minutes From the September Meeting:

The meeting was called to order on September 14th by president Gene Milligan at George Hayes' home at 7 P.M. Approximately 30 members and guests were present.

Old Business: Patches are in--2 for \$5.00. They look great! Please make your purchases now so we can pay for the patches. Holidays are approaching-----buy one for a friend-----buy one for two friends! If you are one of the lucky . . . buy one for three friends!

New Business: It was by unanimous vote that 5% of proceeds from auctioned items be donated to the Chapter 43 treasury. Obviously, more can be donated if desired by participants.

Editor's Notes:

- Please send "For Sale" and "Wanted" advertisements to Dwight Cresap, P. O. Box 572, Niwot, CO 80544 for inclusion in the next newsletter by the 20th of the month.
- Send project information with photos and a brief description to above address.

COMING EVENTS:

- Oct. 28 Air Festival '96, Pueblo, CO. Info: 719-948-3355.

Call the Flying Activities Hotline at 766-3596 at any time for current listed flying activities.

FOR SALE:

- Garmin GPS-90 - \$350 (half price), Delcom hand held transceiver - \$150 (half price), Rotax 532, used, \$200 OBO, 2 - Rotax 'B' Drives - \$200 for both items, 2 - ADS starters - \$100 for both items, misc. flight instruments for light aircraft at half price or less, contact Dwight Cresap, 303-652-2061.
- KITFOX project: the Airframe and all steel parts have been professionally sandblasted and primed. The fuselage kit is complete with the landing gear complete and in place. The joysticks and rudder pedals are installed and cables/linkages installed. The engine is mounted to the Airframe The Wings have been assembled and need to be mounted to the Airframe. Engine: Rotax 582 LC. Also included: Oil injection kit, wing tanks, speed fairing kit, strobe light system, NASA type vent scoops, pre-sewn windows, flaperon mass balance system, cabin heater kit, gascolator with bracket, ground adjustable prop with leading edge inserts, embroidered upholstery kit, carpeted side kick panels, sound absorbing kit, baggage sack and complete instruction manual. Instruments include: Airspeed indicator, altimeter, compass, tachometer, vertical speed indicator, hour meter, slip/skid, water temperature, EGT. Price: \$15,000. Contact: Scott Maddux, 303-424-4072.
- KX170B, 720 COMM/NAV: KI209 indicator; KN75 g/s King radios, \$1,600. Mike McGinn at Tri-County, 661-0155.
- Ray Jefferson Model L-100 Loran C receiver with mid-continent chip installed; Ron Denight fabricated preamp; 25 feet of RG58AU Coax Cable. All items are new. \$275. Dean E. Smith 421-4810
- KMA-12 Audio Panel with 3 lite marker receiver and antenna. Please make offer. Bob Green, 659-5829.
- One pair 8.00 x 4.0 Cub Wheels and Brakes. Don Coleman, 666-8870.
- **Wanted:** Partner for 1/2 interest in 1966 Cessna 210 F. 2100 TT, 700 SMOH, Full IFR. Not a beginners airplane. \$25,000. Bob Hass, 303-438-7164 (H), 303-294-9797 (O).
- Start collecting items for the auction to be held at the October meeting.

SAMPLE LIST OF ITEMS TO BE AT CHAPTER 43 AUCTION:

Tube Flaring Tool
Wet Compass - near new
Used 38 REM Spark Plugs
Pro Com Intercom - 2 place
Mosler 60 H.P. Engine (Note: brand new '0' time since new)
Miscellaneous AN hardware (nuts and bolts, new and used)
Seat belt shoulder harness assembly
Tie downs
Turn buckles
Instruments
Hand held transceiver
GPS-90
4130 tubing (assorted lengths and wall thickness)
Seat cushions
Miscellaneous tools (too numerous to list)

FROM THE RIGHT SEAT:

Steve Beach



SEPTEMBER MEETING:

Our thanks and appreciation to George Hayes for opening up his workshop for the September meeting. Despite the rather drizzly/cool evening we had a good turnout. Everyone was impressed with the workmanship and progress that George has made on his 'Pietenpol look alike'. In addition to the fuselage and wing components that were on display in the garage, a 40h.p. Rotax was also on a bench. George recently picked up the engine from Dwight Cresap and said that it should be a good match for the airplane. I'll bet having the engine in his possession is a real stimulator to keep the progress on track.

Along with the congratulations he also got a few good hints on what he could do to prevent problems down the road. Getting some constructive criticism was one of his objectives in having the chapter view the project in its present state. Not only did George get a few good pointers but many of us learned a few good techniques that can be applied to our own building projects.

Thanks again George.

OCTOBER MEETING:

In October we will return to the Colorado Aero Tech for an auction of what ever you want to bring. Five percent of the selling price will be donated to the chapter to help build up the coffers.

Any items that you want to donate entirely to the chapter will also be accepted with open arms. Tools, aviation related items and anything else that might be appropriate is welcome.

VOLUNTEERS:

We are in need of someone to chair the annual banquet in January. Contact has been made with the same hotel as last year but a the details still need to be worked out. Please contact any of the officers if you can help out with this event. We also need to set a date at the next meeting. Saturdays in January are already booked.

Dwight Cresap has also indicated that he would like to pass on the newsletter to a new invigorated person. This is a hard job and Dwight has done a great service to the chapter over the last year. If anyone can produce a newsletter in 1997 please let Dwight or Gene or me know.

We can also use articles for the letter. These can be short pieces about projects, flights, members, helpful hints for building or flying, political aviation awareness, etc. etc. Small (or large) articles from various sources really can help the newsletter editor out and creates a good interest in the chapter.

As an example note Doug Bloomberg's engine article that is being published this month in this letter. This is an article that has appeared in the national RVator as

well as the local Rocky Mountain RVator.

OFFICER ELECTIONS:

October is officer nomination month. Think about running for a chapter office. There is some work involved to make the chapter run, but the work is usually fun and rewarding.

Everyone, and this includes the young, the young at heart, new as well as old members, is eligible and can certainly help in some capacity. The more members that become actively involved create a solid motivated chapter.

A FLY-IN:

RV non-admirers may want to skip to the next section. Yes, this is another RV story, sort of.

Saturday September 28th was a day for a fly-in. The weather was ideal with smooth warm air, blue skies and lighter winds. From the talk on 122.75 it was obvious that Burlington was the destination for many aircraft. Mas had graciously offered a ride and I was aboard his beautiful RV6 on-route to the first annual Rocky Mountain RVators Burlington Fly-In and Lunch.

Tony Cochran formed up on Mas's right wing shortly after take-off from Jeffco and Mark Graf was not far behind. John Evens was shortly behind Mark but had opted to go

the Pueblo fly-in first before joining us at Burlington. And, in case your wondering, the RVer's do welcome all types of aircraft. Spotted in the rows with the 33 RV's were Tony's (Dean's) and John's Thorps, a Glassair, Mike Seavall's Lancair 4P, a couple of Cherokees and a C-172.

The performance of the RV never ceases to amaze me. We were cruising at a very reasonable 183 mph ground speed (small tail wind factor). About ten miles out Mas pushed the manifold pressure up a couple of inches to get better spacing for all of the aircraft that were converging on the airport. We entered the downwind at a GPS indicated 214 mph ground speed and yet the landing was at just below 65. This was all done without super shocking the engine or creating any uneasy feelings. I was impressed once again.

The City of Burlington sponsored the event and provided a steak lunch for all attendees. However, a donation pot at the end of the lunch line was filling fast indicating that everyone was appreciating the hospitality. A banquet on Saturday night was attended by more than 75 RV enthusiasts.

All the attendees had a great time getting reacquainted with old friends and meeting new people. Many, such as Tony, spent the day solidifying the fact that the RV was the choice of aircraft to build. States represented were Texas (5), Nebraska, Oklahoma, Wyoming, Washington, New Mexico and Colorado. Craig Bair, from York NE, was there with 'The Other Woman' featured in the September Sport Aviation on page 32. The article just barely does the aircraft justice. The riveting is so good that no filler was used before painting and everyone was hard pressed to locate any of the indentations.

Craig told me that he had used Cleveland Aircraft Tool dimple dies and would never consider ever using any other type. More expensive but definitely worth it.

Bill Benedict from Van's Aircraft had flown in with the companies RV6-A and, as usual, spent the day giving as many rides as possible. Chapter 43 was well represented with the people mentioned above as well as Doug Bloomberg, and Aaron Schomberg. As mentioned earlier Doug's article on finding an engine for his RV is being reprinted in this letter.

This event is another fine example of how aviation related events just seem to come together. Congratulations to City of Burlington, local Burlington RV builder / sponsor John Stewart and the Rocky Mountain RVators. See you next year!

UPCOMING CHAPTER 43 PROGRAMS / EVENTS

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|-----------------|--|
| October | Annual Auction To Benefit The Chapter and Members. |
| November | Modeling |
| December | How To License Your Homebuilt |
| January | Annual Banquet |
| February | ?? |
| March | ?? |
| April | ?? |

Finally, An Engine

by Doug Bloomberg

In February, I spent a few days in Texas working with Bob Avery and Martin Sutter on the first QuickBuild kit. Texas hospitality is famous, and Texas RV hospitality is even better, so I was treated to a number of fun experiences. I'll save the tale of flying, legally, between the buildings of downtown Dallas at 800' and lower, (a lot lower!) for another time.... but one good day included a ride in Martin's beautiful RV-6 to see where Texans get their engines. A lot of them get them from a gentleman named Bobby Osborn. Bobby lives on a Vietnam era helicopter training facility. He has a house, three hangers, 19 acres, a 2400' paved runway, 32 cattle, and even his very own control tower. The hangers were absolutely stuffed with airplane engines. Lots and lots and lots of engines and parts for engines. I have never seen so many engines in one place. In fact, we just bought an O-235 for our new secret project from Bobby....anyway, the secret is leaking out of Texas, and Colorado RV-6A builder Doug Bloomberg sent us the following article: - Ken

A major concern for every RV builder is how to propel their aircraft through the heavens. We would all like to buy a new O-360 from Van, complete with constant speed prop.

For some that is a reality, but most of us settle for a overhauled, near run-out engine, or run-out engine. I have often flown with Mas Yoshida, and every time I marvel at what a wondrous air machine his RV-6 is. It uses an O-360, 400 hours into its first overhaul, with a brand new constant speed prop. All of the pieces fit together into a harmonious balance of powerplant, prop, and airframe. I had to have that. But then I was able to coax a ride in George Orndorff's RV-6A. This airplane had an O-320 with wood prop. It gave me same feeling; it was the perfect aircraft. That told me something: it's not the engine/prop that makes the plane.

O-320-H2AD: The Good, The Bad, and The Truth by Doug Bloomberg

The poor old Lycoming O-320-H2AD has had a bad rap for almost 20 years now. Does it deserve it? I am *not* an engine expert, particularly Lycoming engines. But I do know some knowledgeable folks who have seen the insides of a Lycoming once or twice and I use their knowledge here to present my case.

The Engine

The O-320-H2AD is a 160 HP @2700 rpm, 4 cylinder engine, built by Lycoming for Cessna Aircraft. It utilizes a dynafocal engine mount, and the two magnetos use a common drive. The pressurized 6 quart oil system must have an external oil cooler and may utilize an oil filter. It uses a MA4-SPA Marvel Schebler carburetor and has provision for a mechanical fuel pump and vacuum pump.

There is no accessory case, just milled pads on the engine case for the external accessories. There is a pad in top front left for the fuel pump. On the opposite side of the case, above #1 cylinder, is an unmilled pad for a prop governor, although the C-172 uses a fixed pitch prop. (I don't know what would be involved in converting the engine to constant-speed operation.) Heading aft, the oil filter, vernitern and oil cooler outlets occupy the top right rear of the case. Dead on the centerline near the top of the case is the tachometer outlet. Below this is a strange looking affair, the Bendix magnetos. There is a single drive point from the engine and a siamesed dual magneto similar to the unit on IO-540s. On the left side of the case is an external geared oil pump with vacuum pump pad incorporated into the oil pump. Above this is the case vent.

The dynafocal mounts are bolted to the engine, not cast into the case as in the O-320-E2D. It looks odd but it is lighter and narrower.

Because there is no accessory case and assorted gears, the various driven accessories are driven by the camshaft or gears inside the case. The cam sits a little higher in the case, and instead of using mushroom shaped valve lifters, straight sided automotive lifters, removable without splitting the case, are used. The cylinder head is also different. The rocker arms are an adaptation of automobile style (which have been used for 40 years in the auto industry). The rocker arms are attached to a single stud instead of a rocker shaft. The crankshaft, like all non aerobatic Lycomings, is hollow.

The Reputation

- When the engine was new it developed a reputation for camshaft and lifter failure. A Cessna service kit (SE-79-14 #LW16516) replaced the lifters. A year later an AD required a special oil additive, LW16702, at about \$13.00 a treatment, to be used each oil change. Aeroshell contains this additive and using it complies with the AD. Also AD#80-04-03 Amendment 39-3642 requires the oil filter be cut open and inspected for metal particles each oil change. (For a complete list of ADs, consult your local IA.)
- If the engine is being overhauled and the case is apart, "squirters" (Ney nozzles) can be installed which mist the cam while the engine is running.
- Magneto problems: Although it has been used in several engines for many years, the single magneto drive raises concerns about a single failure causing the ignition to all plugs to stop. One solution might be to replace the dual mag with a single mag, and use a separate electronic ignition. A couple of ADs exist for the magneto, covered in Cessna Service Letter SE 79/48. These are L-1163 P/N 10-622007, checking for mag block slippage and a cover seal kit; AD 82-11-05 Amend 39-4389, inspect mag seals; AD 78-09-07, inspect mag impulse coupling.
- Leaking tach drive oil seal. Seal the drive opening and use an electronic tach.

As you can see these problems were caught and corrected early on in the life cycle of the engine. Essentially you will have reoccurring inspections for metal and mag failure. The Bottom Line, again from the experts: Once the AD's were complied with the failures stopped.

Fitting in an RV

- The up front fuel pump requires a blister in the cowl. There is some concern that the location might cause vapor lock. This can be fixed by a bypass orifice returning hot fuel and bubbles to the fuel tank, though not using a gascolator and having inline fuel filters might just cure the problem.
- The magneto drive causes an interference between the engine and upper dynafocal mount. Van's has a fix for this. In an RV-6A, the sump will interfere with one of the braces to the nose gear leg. Again, Van's can provide a special order mount that fits.

It's Van's airframe that makes the plane. With that flight experience, I have kept an open mind about engines.

Then the Rocky Mountain RVators met at Stan Wawrzyniak's project and I heard about a cache of engines in Texas, owned by a fellow named Bobby Osborn. Bobby has an STC to change a Cessna 172's O-320 to a O-360 and has first refusal on all engines changed out. Many are Lycoming O-320-H2ADs from Civil Air Patrol C-172's, some first run, some overhauled, all with high hours. The standard RV dynafocal mount had to be modified to fit the H engine but Tom Green of Van's had the proper piece to weld into place. (I have heard that Van's, with proper incentive,

HINTS FOR HOMEBUILDERS (continued):

lots of us asking Van's "When you gonna build an H engine mount?").

I had not heard great things about the H engines, and I had never heard of Bobby Osborn, so I did some research. I talked to Larry Vetterman and Martin Sutter, both experienced RV builders who know the Texas RV scene well. Larry called me back with "The Word": First, Bobby Osborn was a very reputable man, knew engines inside and out and if you had a problem with one of his engines he would make it right. Second, the H's are good engines. There are an awful lot of C-172's powered by O-320-H2ADs that are *not* falling out of the skies. Service history had revealed a couple of problem areas, like almost any other engine in the world, and when these were fixed, they work just fine. (See sidebar)

Next step, call Mr. Osborn. I called on a Sunday, figuring to get a recorder. Instead, Bobby answered. I apologized for bothering him, but he said that wasn't a problem (his normal hours are M-F 8-6). I asked him about the engines. He said he had plenty of H engines but couldn't guarantee availability forever. They were priced at \$3500 for a first run, and \$2800 for a second run. He also had a second run-out O-320-E2D for \$4800 and a O-320-D2A for \$6000.

I explained what I wanted and he said he could and would help me find an engine.

After a long drive from Denver to Texas, (passing near Raton, NM, a place that has to be one of the most beautiful and desolate areas East of the Rockies...in 100 miles I counted more antelope than cattle.), I arrived at the Osborn's.

In front of the middle hanger he had 8 or 9 engines, all H's, set out on pallets. Inside I found approximately 100 more aircraft engines, Continentals, Lycomings in various sizes; O-290; IO-520; IO-540; O-320, but not a single O-360 Lycoming. I saw numerous cylinder assemblies, and shelves of accessories, pumps, carbs, etc. Bobby told me about the various H engines he had, the hours on them and years since the engines were taken from service. These particular engines were never used as training engines. The CAP used these engines to fly their missions, and failure of an engine in a CAP plane would be considered, "poor form". Therefore, maintenance was top notch.

I explained I wanted an engine that I could fly through the flight test period, then overhaul. Not knowing where or how to start, I relied on Bobby. He suggested an engine with around 2000 to 2100 hours that had had little major work done to it.

We pulled up some chairs, grabbed some log books and started reading. We chose an engine that had been placed in service in 1978, at Tuscaloosa, AL. It was removed from a C-172 in December, 1994, with 2100TT. The carb had been sent back and all AD's complied with in '93. In 1985, #2 cylinder was replaced due to erosion of the exhaust port, but that is not an internal problem. Oil and filter (I wanted an oil filter, but not all H engines have them) changed every 40 hours (even though Cessna recommends oil changes only every 100 hours) and the Lycoming additive used since the first oil change. All AD's in force when the engine was removed had been complied with.

Next, we inspected the actual engine. We pulled the rocker covers, removed the pushrod tubes and used a magnet to pull the lifters out. (You can do this as this engine uses modified Ford 302 valve lifters. This amazed me as I once spent most of a weekend removing several lifters from a Chevy 6 cylinder.) Checking all of the lifters and cam lobes, I detected no spalling or pits in the wearing surfaces and there was still a goodly amount of oil on the cam lobes. It

seems the Lycoming wear additive was doing its job. The oil pump on a H is easy to remove so we did; and no wear was apparent. The plugs were dry as a bone with a light brown deposit (which is good) on them. The log book had shown a consistent compression reading of mid 70 ranges for each 100 hour check, the final check had shown reading of 74,75,75,76 lbs of compression. The same three A&Ps worked on the engine for its life in the CAP. Bobby had preserved the engine by spraying turbine engine oil into each cylinder through a spark plug hole, while turning over the engine, then spraying more into the crankcase.

Bobby felt that it was as good as any engine there. I wrote a check for \$3500 and suddenly owned a first run 2100 Hour TT engine, with ring gear, carb, dual mags, harness, and an oil filter, but no starter, alternator, or vacuum pump. I also had a pretty good inspection and a warrantee that Bobby would replace any parts.... plus he and his wife took me to a great Texas Barbecue dinner that night.

As Van says about engine conversions, "The best engine conversion is to convert \$5000 into a Lycoming Engine". Well, Van I did that, and some better. Of course, you don't have to go to Texas to pick up an engine. But then you would not have the joy of inspecting engines, driving 70+ mph across most of Texas, good Texas Barbecue, or particularly, in meeting the Osborns.

• Who to contact:

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