# EAA MILE HIGH CHAPTER


| PRESIDENT | VICE PRESIDENT | SECRETARY | TREASURER | NEWSLETTER |
|---|---|---|---|---|
| KIRBY WHITE | FRED SEAL | KIRBY WHITE | CATHY SHEEON | KIRBY WHITE |
| 423-5134 | 659-1589 | 423-5134 | 469-6456 | 423-5134 |

VOLUME 12, ISSUE 5, MAY, 1989


THIS MONTH: This month's meeting will be held on Saturday, May 13, 1989 at 7:30 P.M. in the Club Room of the Denver Air Center, which is at the junction of the two main roads leading into Jefferson County Airport. The program will be a selection of videotapes, from which the members can decide which one they would prefer to watch.

LAST MONTH: With 55 members and guests in attendance, the meeting of April 8, 1989 was called to order at 7:45 P.M. by President Kirby White in the Club Room of the Denver Air Center. The minutes of the March meeting were approved as published in the Newsletter.

Guests: Guests present were LeRoy Bradrick of Thornton, Merle Friskney of Arvada, Michael Hughes of Erie -- who owns a Cessna 140, and Bob Fields of Garden Grove, California.

Treasurer's Report: There was none given.

Old Business: The subject of the Rocky Mountain Regional Fly-In was brought up. Kirby said that everything was being planned and everyone was looking forward to having a really good Fly-In this year. Kirby hoped for a really good turnout of Chapter 43 members at the Fly-In, which is to be held on July 14-16, 1989 at the Loveland/Ft. Collins Airport. The poster which was published in the April, 1989 Chapter 43 Newsletter about the Air Rallye (which will financially benefit the Fly-In) had a typographical error in the dates. It should have read May 20, 1989 with a weather date of May 21, 1989.

New Business: Kirby informed everyone of a picnic that EAA Chapter 660 was sponsoring at the Front Range Airport on Saturday, April 15, 1989 from about 11:00 A.M. until whenever. A rain date of April 22, 1989 was suggested, and all of the members of Chapter 43 were invited to join in on the fun. Bill Landers said that he had come across a good deal on last year's edition of "Jane's All The World's Aircraft" for $50.00. He said to contact him about where to order more copies if interested.

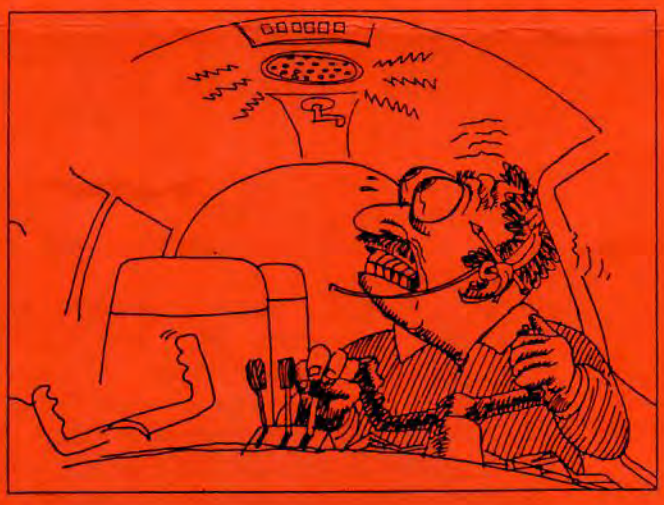
Gene's Corner: Gene Horsman talked about a tour he had recently taken of the Longmont Air Traffic Control Center. He said it was interesting, but he was a little disappointed because he only got their canned presentation and they wouldn't really address the problems that concern those who fly low and slow. Gene read the following article which he had found in the March 30, 1989 issue of the Denver Post: "New License To Lower Sport Flying Costs" Washington -- The FAA Wednesday announced a new pilot's license that it said will lower the cost of learning to fly a plane for sport by up to $1,850. The new recreational certification for flying basic aircraft, in-

Gene's Corner cont: cluding homebuilt and experimental models, will require less training and experience than a private pilot certificate.

Progress Reports: Brad Davenport showed a controllable propeller that he had been doing some design work on the past few months. It is made of carbon fiber, and is very lightweight. It has its own oil supply and cockpit mounted hydraulic pump. The Limbach 1700 engine that it will be mounted on does not have any practical means of supplying the oil. The propeller will full-feather, which is a necessity because it is for a powered glider that Brad is building. Everyone thanked Brad for bringing in the propeller and talking about it.

A&P: The business portion of the meeting adjourned for coffee at 8:00 P.M. After the break, Jim Anderson showed a short videotape of the Confederate Air Force's B-29 "Fifi" which was taken when it was on display in Denver a few years ago. There were some dramatic shots of it in the air over downtown Denver. One of the local radio stations even used it to broadcast traffic condition reports from! Also on the tape was an informal talk by Bob Caron, who was the tailgunner on the Enola Gay the day it dropped the bomb on Hiroshima. He related his experiences of that day from the tailgunner's position. Bob now lives in Denver. The other videotape that was shown was about the development of the P-51 Mustang and the design changes it went through and the part it played in winning the war. The tape was actually a general history of WWII.

BD-4: The BD-4 fuselage kit and complete set of plans that was donated to Chapter 43 a few years ago by Don Mobley has not received any real interest as far as someone wanting to make a Chapter project out of it. Chapter 43 member Ken Lysek has looked at the plans and what has already been done on the fuselage and has decided he would like to take over the project and complete it. He has made an offer of $100.00 for it. If anyone else is interested in it, or if anyone has some thoughts or comments on the subject, would they kindly let Kirby know before this month's meeting. A vote of the Chapter members of whether to sell the project to Ken will be held at this month's Chapter 43 meeting.



*"Aircraft encroaching on the Doomsday TCA with the Mode S squawk, we know who you are. A violation will follow."*

# How Mode S Works

The Mode S system is to the current ATCRBS Mode A/C system what a Ferrari GTB is to a Ford Model T. It does more. It does more faster. And it does it all more precisely. It also can accommodate the current system for position (Mode A), altitude (Mode C) and the special requirements of military operations (Mode M, or IFF).

Improvements have been made to both the air and ground elements of the current system. These have ameliorated some of the problems, but they have not solved them.

The concept of a more sophisticated radar system for air traffic control was conceived in the late 1960s. Hardware and software development had moved into the test phase by the mid-1970s, but the first products were not ready until the late 1980s (the first avionics systems, Mode S transponders, were announced in 1987). From the start it has been a highly ambitious program.

The SSR/ATCRBS transponder system a quarter of a century ago was showing critical saturation, insufficient precision and an inability to adequately distinguish among targets. It was fairly clear what was needed. How to achieve it reliably without decimating air traffic proved tougher. The solutions came with advances in software and integration/miniaturization of electronic circuitry.

Current ATCRBS is an all-call, or party-line system. All equipped aircraft in the three-degrees-wide beam of the ground radar at a given point in the antenna sweep respond at the same time to each interrogation. Along with saturation, the system experiences combined returns (called synchronous garble or shadowing), imprecise azimuth measurement (called fruit) and other anomalies. These problems increase with traffic density, which is precisely when accurate identification and distinction among targets become most critical.

The essential design driver of Mode S is the requirement to selectively interrogate specific target aircraft. This is accomplished by design improvements of both the ground and air system elements.

Basic to the ground system is adoption of a British-developed radar transmission technique called monopulse, which allows faster target location by resolving azimuth determination in a single sweep, or one interrogation transmission and reply for Mode S and two sweeps each for Modes A and C. According to an ICAO paper, monopulse is up to five times more accurate than current systems in direction-finding.

This development alleviates a characteristic of the ATCRBS/Mode S system. The interrogation and reply data transmissions are longer than the Mode A/C/M format. There also is a greater number of messages provided for. Monopulse, together with the selective address capability, reduces the number of transmissions at any one time. Without this improvement, Mode S could not resolve the saturation problem and could possibly make it worse.

Among other features of the design is an improved ability to coordinate the activity of multiple SSR sites, called teaming. The advanced ground system can lock out certain interrogations, such as the all-call message. Communications among ground stations are improved.

The enhanced design greatly increases the number of codes available and provides a method called interrogation management, in which transmissions can be sequenced on a priority basis, such as time and range. Or, the ground system can select just one aircraft for interrogation. Mode S SSRs also predict the time of the next scan of a Mode S-equipped aircraft to properly sequence messages.

A key element is the assignment of an embedded code that specifically identifies each aircraft. This 24-bit, binary code is hard-wired during installation and is the discrete address of that aircraft. (No more hiding who you are. Enforcement officials will love it.) The combination of a dedicated code for each aircraft and the substantial increase in ATC-assignable codes improves system capacity.

SSR transmits all-call interrogations for each mode and on the same frequencies as the current system (1,030 MHz and 1,090 MHz). The Mode S all-call is distinct from the other modes; equipped aircraft identify themselves by their discrete codes.

Once a Mode S-equipped aircraft is identified, the ground station can communicate with it selectively, eliminating replies from all other Mode S targets and other modes. Mode S transponders also can identify special capabilities to the SSR, such as data link.

There are seven different message, reply or data link formats programmed into Mode S transponders. These include: Mode A; Mode C; unique identification; short, or standard 56-bit message for surveillance; long, 112-bit message for air-to-ground and air-to-air data link; and extended-length (ELM), up to 1,280-bit, for data link messaging. Digital phase shift keying technique is used.

The longer message duration, or power pulses, of Mode S requires it to be a higher-performance unit than current ATCRBS. Specifications and tolerances are much tighter, as well.

Unique to Mode S is its ability to interrogate other aircraft, which is why it is a central element of current TCAS design. This level of interrogation, which is not dependent upon the ground system, is termed squitter. To avoid replies from Mode A/C aircraft, the interrogation uses the pulse sequence and power that Modes A and C recognize as SSR side lobe transmissions (that is, they are not in the primary beam). Modes A and C are programmed to suppress these.

The air-to-air interrogations are programmed to sequentially increase in power to query nearby aircraft first. If replies are not received, the system automatically increases power (and, therefore, range). This technique is dubbed whisper/shout.

Current remote-mount Mode S transponder systems include controls identical to current ATCRBS transponders. If and when data link messaging protocols and applications are established, a digital display (and a printer) will have to be incorporated. This could be a dedicated display or be combined with other displays, such as weather radar or a multi-function display.

Mode S transponders designed for use as part of a TCAS II system include dual receivers and require installation of two omnidirectional antennas, one on top and one on the bottom of the fuselage. Through something called antenna diversity, the system automatically selects the antenna with the strongest signal. This is to avoid shadowing or blanking of signals by the airframe, particularly for TCAS functions.

Currently, it is thought that less sophisticated versions of Mode S transponders can use the now-familiar stubby blade antenna used for ATCRBS installations.

Mode S is a far more sophisticated system than Mode A/C. It is a discriminating transponder for the busy-airspace user.

April 27, 1989

Kirby White
8780 West 90th Place
Westminster, CO 80020

Dear Mr. White:

I have a partially completed Christen Eagle II I Would like to sell which includes the following kits.

901 Ailerons Kit
902 Lower Wing Kit
903 Upper Wing Kit
904 Fuselage Structure Kit
905 Landing Gear Kit
906 Tail Structures Kit
907 Fuselage Equipment Kit
908 Cockpit Equipment Kit
909 Fuel System Kit
910 Electrical Kit
911 Instruments Kit
913 Seat Belts Kit
914 Fuselage Panels Kit
915 Canopy Kit
921 Rigging Kit
922 Fairings Kit
923 Covering and Prefinish Kit
924 Flight Kit

The Christen Industries price sheet dated February 24, 1988 shows the present cost of the kits listed to be over $30,000.00. I will take $15,000.00 for my Eagle. If you know of anyone who may be interested please give them this information.

Sincerely,

Brad Hickman

Brad Hickman
P.O. Box 38
Woodward, OK 73802
Phone: Work 405-256-8688
Home 405-254-2215

MARKETPLACE: For Sale: 1940 Piper J-4A project. Fuselage on gear ready for cover. Have new wood spars for wings. Tail feathers ready for cover. Instrument panel with instruments installed. Have all material for leather & valour upholstery. Continental A-75 disassembled for overhaul. All cylinders overhauled. Have metal propeller. A good project for first timers. $5,250.00 buys all. Call EAA member: Richard L. Smith, Route 2, Box 218, Goodman, Missouri 64843 417-364-7493

For Sale: 3 used Goodyear Flite Custom tires and tubes in good condition. Size 15-600x6. Make offer. Phil Young 665-5773

For Sale: Vari Eze project. Parting out at 25¢ on the dollar for component parts such as landing gear bow and wheels & brakes and nose gear and wing attach fittings etc. All parts are from Ken Brock Manufacturing Co. David McElroy 292-4018 during the day.

# The Great Colorado Air Rally

When is it? May 20, 1989 with a weather date of May 21, 1989. Start time is 8:00am to 9:00am. More details when you pre-register.

Where is it? Begins and ends at the Boulder Airport.

How does it work? Each pilot will get a packet of clues. It will contain a series of headings and distances with obvious landmarks to note. There will also be word puzzles leading to several airports.

What's a word puzzle? This is an example. Answer the questions and read the airport vertically in the boxes.

Three tailed airplane

Phantom

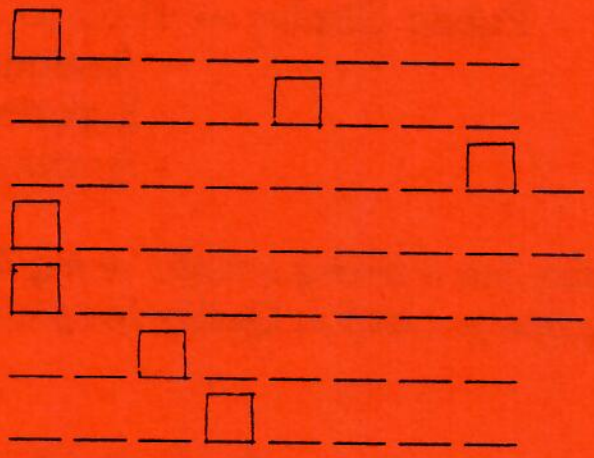
First piper

P-38

Composite insect

PT-17

French all wood design



How do I sign up? Pre-registration is important to organize this event. Please call Cathy Sheeon at 469-6456 or Daphne Davenport at 444-0734 as soon as possible or at least by May 12, 1989. Sponsored by EAA chap. 43.

How long will it take? Approximately two hours to complete the course. This is based on a 100mph aiplane and landing at the specified airports.

How much does it cost? Ten bucks per plane. Your money will be donated to the Rocky Mountain Regional Fly-In.

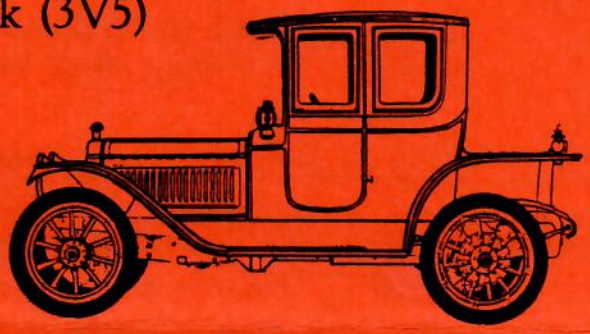
What do I need? A partner if possible, Denver & Cheyenne sectionals, a sense of humor and your thinking cap.

Extra Features!!! Wilda Davenport's famous cinnamon rolls while you wait to take off. Homebaked cookies & lemonade upon your return.

# "FLY-IN BREAKFAST"

## ANTIQUE AIRCRAFT AND AUTO CLUBS

Downtown Fort Collins Airpark (3V5)



**May 13, 1989**

Breakfast — 9:00 to 11:00 a.m.

Public Display — 11:00 to 2:00 p.m.
- Antique Aircraft
- Experimental Aircraft
- Antique Cars

*Quality Inn is serving a buffet costing $5.85 including tax & tip.*
*Free transportation to Quality Inn provided by Hertz Car Rental*

★ ★ ★ ★ ★

## *Quality Inn's Special Mother's Day Package:* $69.95

*includes:* Hot Tub room for two
Champagne in your room
Prime Rib dinner Saturday night for two
FREE breakfast for Mom on Sunday

*(Other room packages available upon request)*

RSVP: Annetta Saxerud
303-484-4186

Rain Date May 20th

COMMUNITY AIRPARK ASSOC. INC.

2200 AIRWAY AVENUE
P.O. BOX 23
FORT COLLINS, COLORADO 80522

experimental aircraft association

WITTMAN AIRFIELD, OSHKOSH, WI 54903-3086 • PHONE: 414/426-4800 • FAX: 414-426-4828

Volume III No. 4 MONTHLY GRAM April 1989

PRIMARY AIRCRAFT CATEGORY

More than five years ago, EAA submitted a petition to FAA regarding the creation of a new category of aircraft. The petition outlined a number of ways in which sport aviation could become accessible to a greater number of participants. The petition was in response to the economic downturn of the early 1980s and the decline in the number of people beginning sport aviation flight training. FAA recently issued a Notice of Proposed Rule Making (NPRM) detailing a plan to create the "Primary Aircraft Category," based on that EAA petition. The new aircraft category will simplify the procedures for acquiring certification for type, production and airworthiness as well as maintenance procedures. The Primary Aircraft Category was created specifically for personal-use "recreational" aircraft that will not be used for commercial purposes. Subsequently, the certification process for these airplanes will be less complex than the guidelines that exist under the current system. To qualify for Primary Aircraft Category certification, an aircraft must have a maximum gross weight of 2,500 pounds or less; be unpowered (such as gliders and balloons); or powered by a single, naturally aspirated engine of less than 200 horsepower. In addition, the airplane can carry up to four people (including the pilot) in an unpressurized cabin. Pilots who operate aircraft certified under the Primary Aircraft Category will be authorized to perform more of their own maintenance procedures, provided they hold a private pilot certificate, own or co-own the airplane, and have received FAA-approved maintenance training for their aircraft. The maintenance will have to be performed in accordance with an FAA-approved inspection and preventative maintenance program. This new category can cover aircraft ranging from single-place ultralights to the popular Cessna 172 or Piper PA-28. The new rules for the "Primary Aircraft Category" will not affect the ultralight movement or the rules governing ultralights, unless an ultralight owner chooses to register his ultralight under the new Primary Aircraft Category. Comments on the proposed Primary Aircraft Category will be accepted by FAA through September 7, 1989. Send your comments IN TRIPLICATE, to:

Federal Aviation Administration
AGC-10 Docket No. 23345
800 Independence Avenue S.W.
Washington, DC 20591

CERTIFICATION OF RECREATIONAL PILOTS

The recreational pilot certificate is intended to provide a lower cost alternative to private pilot certification by requiring less training than is currently necessary. EAA petitioned FAA for creation of a recreational pilot certificate in 1984. The recently released rule, which is similar to the original EAA petition, will take effect on August 31, 1989. The rule is intended for those who are interested in flying basic,

experimental, or homebuilt aircraft within 50 miles of a home airport and in airspace where air traffic control facilities are not required. The rule states that a pilot must hold a third-class medical certificate and may not fly more than 50 miles from the airport where he received his training. The rule also establishes restrictions on the type of aircraft that a recreational pilot can command. A recreational pilot may fly a single-engine aircraft rated at 180 h.p. or less. The aircraft may seat up to four people (including the pilot), but the recreational pilot may carry only one passenger. In addition, the pilot cannot fly for compensation or cross-country and must fly an aircraft with non-retractable landing gear.

SPIRIT OF ST. LOUIS DONATIONS

The EAA replica "Spirit of St. Louis" was built in 1977 to commemorate the 50th Anniversary of Lindberg's crossing of the Atlantic Ocean. After flying over 1,300 hours on a tour of the United States and Canada, the EAA Spirit of St. Louis now hangs in the EAA Air Adventure Museum. Over a year ago, a second replica Spirit of St. Louis was begun and the fuselage and tail group have been welded and the wings are 85% complete. Unfortunately, the project has been dormant due to the lack of funds. If anyone would like to help, donations, which are tax deductible, should be made payable to "EAA Aviation Foundation - Spirit of St. Louis Project" and sent to:

EXPERIMENTAL AIRCRAFT ASSOCIATION
Personal - PHP
P.O. Box 3086
Oshkosh, WI 54903-3086

PAUL'S SURGERY

As many of you may know, EAA President Paul Poberezny underwent back surgery on March 23, 1989. Paul had been suffering from severe back pain over the past few months and the doctors at Mayo Clinic in Rochester, Minnesota decided surgery was necessary. During the surgery, which doctors said was a complete success, the surgeon removed two cysts from Paul's lower back. The cysts were pinching a nerve in the fourth lumbar region, causing his pain. Since the surgery, Paul has returned to Oshkosh and is spending his days working in his office in the Presidential Library. Paul would like to thank everyone for their thoughts, good wishes, and prayers.

SUN 'N FUN - 1989

While attending Sun 'n Fun, Tom had the opportunity to spend an extended period of time with DOT Secretary Sam Skinner. Tom met with the Secretary to discuss EAA's position on a number of key aviation issues. On Tuesday, Mr. Skinner spoke at an EAA Sun 'n Fun Forum. Mr. Skinner is very direct, responded well to the issues and is sincerely interested in improving all of aviation. We feel he is an individual who is not afraid to make decisions that will be in the best interest of the entire aviation community.

THANKS TO JOHN DEERE HORICON WORKS

Earlier this month, the Horicon Works delivered more than 60 pieces of green and yellow John Deere equipment for use at Headquarters. The equipment, which will be used year-round, will be utilized in our vast grounds keeping efforts. We are looking forward to a long and mutually beneficial relationship.

MUSEUM NEWS

EAA Chapter 913 will deliver the completed hull for the scale-model of the USS Enterprise to the EAA Air Adventure Museum in the very near future. The 11-foot hull will be on permanent display in the EAA Eagle Hangar.

YOUTH EDUCATION

Earlier this month, EAA Aviation Foundation Education Director, Chuck Larsen attended the National Congress on Aviation and Space Education where he made six presentations of "Hands-on Aviation--The EAA Way." Chuck demonstrated a number of EAA Air Academy and Air Adventure Day activities to the attendees as well as outlining many of the Foundation's Youth Education Programs. On behalf of the Foundation, Chuck accepted the FAA Administrator's National Award for Excellence in Aviation Education in the Industry/Association category.

P-38 UPDATE

The cockpit on the P-38 was recently painted and the landing gear has been overhauled and installed. The P-38 project is really starting to take shape thanks to the efforts of the EAA Kermit Weeks staff and volunteers. The inspection program on EAA aircraft continues. The B-17 has been stored in the Kermit Weeks hangar for the last few months as it underwent inspection. The B-17 should be ready for roll-out very soon. The B-25 is next in line for inspection.

NEW SHUTTLE SERVICE

The first of a number of proposed transportation vehicles, or "trams," for EAA OSHKOSH '89 has been finalized. The trams are designed to help shuttle flightline qualified pedestrian traffic from gate 31 (near the Coke computer message board) to the ultralight/rotorcraft area on the south end. The new tram will compliment the one already utilized by the ultralight/rotorcraft area. The trams, which can carry up to 20 people, will be pulled in tandem by John Deere tractors and be staffed by a driver and conductor to enhance safe operation.

EAA MEMORIAL WALL

The Memorial Wall, with the first group of names, will be unveiled and dedicated during special ceremonies on Wednesday, August 2, at EAA OSHKOSH '89. We are very pleased with the response to the Memorial Wall. If you would like information on the EAA Memorial Wall, please contact Greg Anderson, Vice President Development, at EAA Headquarters.

MUSIC, MUSIC, MUSIC!

The vintage U.S. Army Air Force band, "Command Performance," who performed at the EAA Eagle Hangar groundbreaking ceremony last year, will be participating at the USO night (Monday, July 31), during the Eagle Hangar dedication (Tuesday, August 1) and at the Warbirds Dinner and Dance (Wednesday, August 2). Former B-24 pilot Skitch Henderson will guest conduct a few numbers during USO Night and the Eagle Hangar dedication.

EAA/FLYING CONVENTION SUPPLEMENT

EAA and FLYING magazine have been working on a joint project to encourage people to attend EAA OSHKOSH '89. Final layout of the 16-page supplement has been completed and will be included with the June issue of SPORT AVIATION and with the July issue of FLYING magazine.

FIGHT FOR FLIGHT

EAA is constantly working to preserve the right to fly in this country. Primarily, our "fight for flight" has been against restrictive government rules, equipment requirements, and so on. We are also seeing an increase in problems at local airports. Some of these problems relate to conditions that are placed on airport tenants by airport managers and city or county governments. These restrictions can be just as devastating to the future of aviation as any sweeping FAA rule. For instance, we recently learned about a serious problem at one of the nation's larger airports involving a Fixed Base Operator (FBO). The operation is part of a larger chain that has been buying up FBOs and, as soon as a monopoly on the airport's business has been established, they increase parking and overnight fees tremendously, raise gas prices and, in general, make it difficult to own or operate small aircraft. Part of EAA's mission is to make aviation accessible to all who wish to participate. We continue to work to preserve <u>all</u> of our rights in this area.

Chapter 43 Newsletter
c/o Kirby White
8780 West 90th Place
Westminster, CO 80020

DENVER, CO MAY 10 M 1989

USA 25 Yosemite

EUGENE HORSMAN
210 LOOKOUT VIEW CT.
GOLDEN, CO 80401