

EAA MILE HIGH CHAPTER



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NEWSLETTER
KIRBY WHITE
423-5134

VOLUME 14, ISSUE 11, NOVEMBER, 1991

THIS MONTH'S MEETING: The meeting this month will be held on Saturday, November 9, 1991 at 7:30 P.M. in the downstairs room on the Southeast corner of the large white building (B-8) which is located to the Southeast of the control tower at Jefferson County Airport. This is where the Deli is. The program will be a talk by Bob Knuth and Chris Franz from the Jefferson County Sheriff's Department. They work in the Aviation Division, which is based at Jeffco, and fly the aircraft that the Department owns. They will talk about their normal duties, the aircraft that they fly, some of the memorable events that they have been involved in, and relate some humorous situations that have occurred while they were on duty. Both of them have quite a sense of humor. They will welcome any questions about their job, so this should be a very enjoyable program.

THIS MONTH'S CAFE 43: The Fly-Out this month (note the new name) will be to The Greeley Airport for lunch on Saturday, November 16, 1991, and we will eat at the restaurant on the field. This is the Saturday after our normal second Saturday meeting. We will meet at The Greeley Airport at 11:00 A.M. Ken Lysek is coordinating the monthly CAFE 43 (which stands for Culinary And Flying Expedition), so contact him at 457-9769 if you have any questions or have an extra seat to offer or are in need of a ride.

LAST MONTH'S CAFE 43: No one called to let me know whether they had gone to the Boulder Airport Day. If anyone went, I hope they had a good time and the event turned out well.

LAST MONTH'S MEETING: With 50 members and guests in attendance, the meeting of October 12, 1991 was called to order at 7:50 P.M. by President Kirby White in Building B-8 at Jeffco Airport.

Guests: Guests present were Kirk Macomber of Lakewood, Grant Macomber of Lakewood, Raymond Rhodes of Aurora, Tony Peltier of Englewood, and Scott Martin of Carbondale, Colorado.

Old Business: There was no old business to discuss.

CAFE 43: The CAFE 43 location for October was changed at the meeting so that we could attend Boulder Airport Day on the following Saturday, October 19, 1991. The event was scheduled from 8:00 A.M. until late afternoon, and a Pancake Breakfast was planned. Ken Lysek asked for suggestions on the CAFE 43 location for November. It was decided to fly (or drive) to The Greeley Airport, which has a nice restaurant on the field, for lunch.

New Business: The main part of the business meeting was the annual election of officers and volunteers. The following 1991 Chapter 43 officers and volunteers were re-elected to another term in 1992: Vice President -- Ken Lysek, Treasurer -- Roy Maneely, CAFE 43

New Business cont: Representative -- Ken Lysek, Chapter Designee -- Brad Davenport, Librarian -- Roy Maneely, Historian -- Herrill Davenport, Fly-In Committee Representatives -- Bill & Mary Mitchell, and Board of Directors -- Brad Davenport and Cathy Sheeon and Roy Maneely. The following position: Grand Keepers of the Coffee Pot (which is possibly the most important one of all) needed to be filled and there were two volunteers for it who were elected: Dick Vose and Bill Mitchell. Kirby announced that he would like to give up most of his duties with Chapter 43. He said that he is way past his saturation point, and needed for a person or two to volunteer their time to help make Chapter 43 run. Bill & Mary Mitchell, as the two main Fly-In Committee Representatives (there can certainly be others, though), agreed to take on all of the Fly-In duties that Kirby has been doing for a number of years, including the trophies and awards. Kirby said that he would like to give up his duties as President, and asked for any volunteers to take over the office. No one raised their hand, and after some discussion on the subject it was decided to form a Nominating Committee to look for a new President. Vice President Ken Lysek said he would head up the Committee, and Cathy Sheeon and Ron Denight volunteered to be on the Committee with him. Kirby said that he would like to keep the Newsletter Editor and Secretary positions, which he said he enjoys, but with the provision that the other things that he has been doing are turned over to someone else so that he will have more time to devote to the Newsletter. Kirby, as mentioned earlier, said that he is way past his saturation point, which accounts for the fact that the Newsletters are not as timely as they should be, which he is very well aware of and apologized to everyone for. Ken Lysek said that the Nominating Committee would find someone willing to be President by the November meeting. Bob Campbell announced that on Saturday, October 26, 1991 there would be tours of Jeffco's tower for some High School students that Bob teaches. Bob invited us to come out and take the tour, and asked that we bring our airplanes to show to the students. Chuck Ogden said that he was planning to fly his Luscombe Sedan to the Kerrville, Texas Fly-In the following weekend. Several Chapter 43 members were planning to attend. Cathy Sheeon wanted everyone to know that she was planning a garage sale the next Friday and Saturday, and had some aviation items for sale along with the normal garage sale type items. Bill & Mary Mitchell said they had been to the Greeley Airport earlier in the day, and had helped work on the Pavilion that is being built there. They let everyone know that any help that anyone can give in building the Pavilion would be greatly appreciated. They also recommended the restaurant that is there. Doug Bloomberg announced that he had gotten the information from his computer aviation service that for the first time a woman had flown the SR-71 Blackbird, the Travel Air Mystery Ship had crashed, and Tsunami had crashed on its way back from Reno. That is all that Doug knew at the time. Daphne Davenport brought up the subject of this year's Chapter 43 Christmas Banquet. She said it would be on our normal second Saturday meeting night at the Plum Tree Restaurant in Lafayette. A sign-up sheet was put at the front of the room for those who had already made plans to attend to put their names on. She and Kirby said it should be an enjoyable evening and hoped for a good turnout of members and guests.

Gene's Corner: Gene Horsman reported that in August, Piper received approval from the Federal Bankruptcy Court to resume production of parts and work on the completion of aircraft already on the production line at Vero Beach. This is a six-month financing agreement blessed by all parties. Piper recalled forty workers. They have \$5,000,000 in back orders for parts. They have set a new price schedule for possible full scale resumption later, from \$142,500 for a Warrior to \$611,250

Gene's Corner cont: for a Malibu Mirage. The "Earthwinds" around-the-world balloon attempt, which was covered in Sport Aviation, is scheduled to begin in November. Questaire has come out of Chapter 11 bankruptcy. Forty-five Venture kits still need to be delivered out of the ninety ordered. Ten Spirit kits have been ordered; however, twenty need to be ordered for kit production to begin. Learjet, which is based in Wichita, is going to hire 300 people because of new orders they have received. NASA is putting an SR-71 Blackbird back in the air. It will do research to study sonic booms, and will also train pilots for high altitude, high speed flight. It will be based at Edwards Air Force Base. Joann Osterud broke the inverted flight record of 4 hours 5 minutes by flying upside down for 4 hours 38 minutes. While doing this, she also set the distance record of 572 statute miles, compared to 300 for the old. The previous time record was set in 1933, and the previous distance record was recently set in 1990. Gene read three articles from Aviation Week & Space Technology, which are printed in this Newsletter. Gene, who many of you know is the President of the Colorado Antique Aircraft Association, cordially invited us to their Annual Banquet which will be held on Sunday, December 8, 1991 in the early afternoon. The reason for inviting us is that the guest speaker will be the renowned author Stephen Coonts. He is a pilot, and has many interesting stories to share. Gene said to contact him for more information on the Banquet.

Progress Reports: Chuck Graf let everyone know that he has completed the left wing on the RV-6 that he is building, and that he has some of the work done on the right wing already. Ken Lysek announced that he has purchased a 1955 Piper Tri-Pacer "kit" (as he called it). Most of the parts are there, the fuselage is covered, the wings are in silver, and it has a 150 HP engine. And no, he isn't planning to convert it into a taildragger. He said he is now looking for a new home for his BD-4 project.

A&F: The business portion of the meeting adjourned for coffee at 8:20 P.M. After the break, Jim Thompson showed slides of the Copper State Fly-In in Prescott, Arizona that he went to the week before the October Chapter 43 meeting, and also some pictures he took while flying to San Diego to see some friends right after that. Everyone thanked Jim for bringing in the slides to share with us.

CHRISTMAS BANQUET: Please make plans to attend Chapter 43's Annual Christmas Banquet on our normal second Saturday meeting night in December. This will be December 14, 1991. It will be held at The Plum Tree Restaurant in Lafayette, and the price will be around \$12.00. All of the additional information about the Banquet will be published in the December Newsletter. Hope to see everyone there!

ENJOYABLE BOOK: I recently had the pleasure to meet Gale W. Day, who has been flying for more than thirty years, much of it from Jeffco. I'm certain that many of you know him. He has written a book on his experiences, which is fun to read because he talks of things and places that we are all familiar with. I have only had a chance to skim the pages so far, but what I've read has been enjoyable. The book is entitled "Born To Fly." Gale will try to attend one of our meetings in the near future to talk about his book and reacquaint himself with those of you who know him.

MARKETPLACE: For Sale: Scott 6" and Maule 6" hard rubber tailwheels, Propeller extension for Lycoming O-235 -- O-320 engines, Telex MRB600 headset, Terra TPX 720 radio, Make offer on all. Mark Yelich 469-0557
For Sale: Half interest in 1978 Piper Turbo Arrow, \$27,500. 443-8243

CRM COCKPIT RESOURCE MANAGEMENT

As vital in a trainer as in a jet airliner



by Don Petrin and John Young

Consider these mishaps:

1. A Cessna 172 slams into a Massachusetts mountain after the non-instrument-rated private pilot experiences spatial disorientation during poor weather. (*NTSB Reporter*, Vol. 8, No. 5, May 1990)

2. An instrument and multi-engine-rated pilot crashes his twin Cessna into the center divider along a California state highway. His doctor had urged avoidance of flight activity after hearing complaints of headaches, forgetfulness, and disorientation. (*NTSB Reporter*, Vol. 8, No. 1, Jan. 1990)

3. A 20-year-old airman plants his *Beach Sundowner* nose first into the ground while performing low-level acrobatics for his friends. (*NTSB Reporter*, Vol. 8, No. 3, March 1990)

Although each of these accidents might be attributable to pilot error—an oversimplified phrase suggesting inappropriate pilot behavior—closer scrutiny would reveal a myriad of causal factors related to CRM, cockpit resource management. [Editor's Note: the FAA now refers to CRM as *crew resource management*.]

NEED FOR CRM TRAINING

Cockpit resource management (CRM) is a means to effectively integrate pilot, aircraft, and environment for safer, more efficient flight operations. Since 80 to 85 percent of all aircraft accidents during the past 10 years have been attributable to human

error, CRM training has been receiving increased attention.

In earlier days, mechanical failure was the primary cause of accidents. But as aircraft design and materials have improved and manufacturers have created more reliable aircraft, only a small percentage of aircraft accidents now result strictly from equipment malfunctions. The same cannot be said about the human element. As pilots, we have become the weaker of the two links.

Fortunately, the airline industry and the FAA have recognized this and are creating guidelines for CRM training. Many airlines now require initial and recurrent CRM training and give preference to pilot applicants who have had previous CRM experi-

Aerobatics, Demonstration Rides Open MiG-29 Tour of U. S. Air Shows

BOSTON

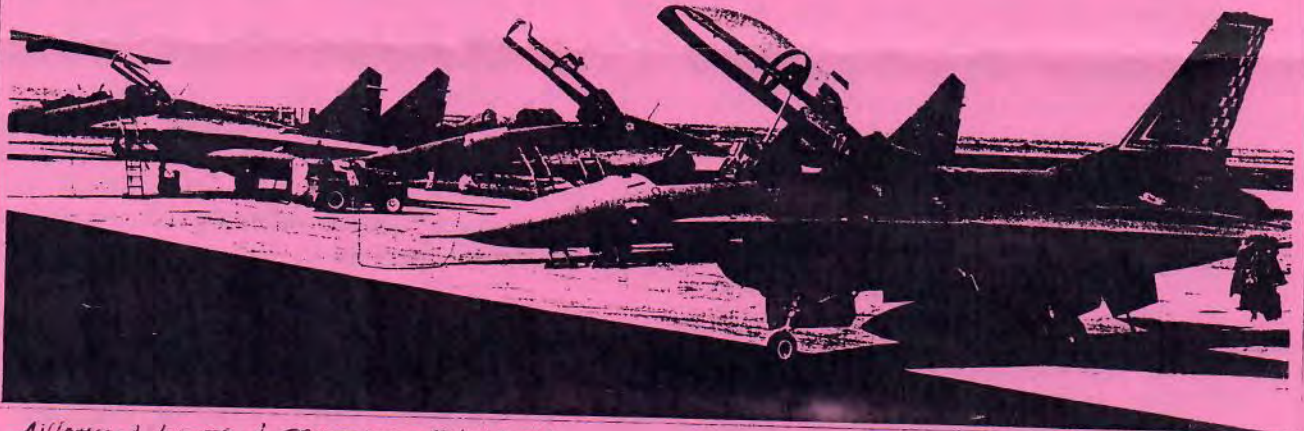
Two Soviet MiG-29s involved in a recently reinstated tour of six U. S. air shows began their visits in Cleveland with aerobatic performances and private demonstration rides for hire.

The MiG-29s flew eight 15-min. demonstration rides at Cleveland to help cover tour costs. The rides were offered for

\$10,000 each, and demand was so great that the number of demonstrations was increased from three to eight. Ironically, the Soviets were giving rides primarily to executives who own their own businesses. Valery Minitsky, Mikoyan Design Bureau test pilot, flew the demonstration rides, which included aerobatic maneuvers and

tail slides but not the Cobra maneuvers performed by other Soviet pilots at the Cleveland National Air Show.

U. S. Air Force F-16s arrived at Cleveland last week to escort the MiG-29s to the next tour show, in Mankato, Minn. Others will be in Harrisburg, Pa., Topeka, Kan., Ft. Worth, and Salinas, Calif. □



AVIATION WEEK & SPACE TECHNOLOGY
Sept 9, 1991

EPA Exempts Aircraft Piston Engines

WASHINGTON

The Environmental Protection Agency has ruled that aircraft piston engines are exempt from amendments to the Clean Air Act of 1990.

Although "the definition of non-road engine literally would include internal combustion aircraft engines, the better reading is" that aircraft engines "are not included within the non-road provisions," John Hannon, Office of General Counsel, Air and Radiation Div. of the EPA, stated in a letter to senior agency officials last week.

Among the amendments passed by Congress in late 1990 was a regulation calling for a ban on the manufacture and sale after November, 1992, of all piston engines used in "non-road" vehicles that burn leaded fuels (AW&ST Mar. 25, p. 9).

Hannon said because of ambiguity in the statutory language and based on legislative history, "the agency does have flexibility" in interpreting the definition of non-road engines. "The better view is that internal combustion aircraft engines are not properly included within the act's non-road provisions," he stated.

Light aircraft builders and the General Aviation Manufacturing Assn. (GAMA) have strongly opposed the legislation, along with the Aircraft Owners and Pilots Assn., Experimental Aircraft Assn. and National Air Transportation Assn. Representatives from those organizations along with GAMA personnel have been working with members of Congress, the EPA and the FAA since January to avert implementation of the provision.

"The logical and rational interpretation of the act's provisions" provides the U. S. general aviation industry "with the breathing room it needs" to develop a lead-free avgas, James D. Gormley, president of GAMA, said. □

LIABILITY NEEDS LEASH

Piper's problems are founded squarely on the huge product liability tail it earned not through Stuart Millar's entrepreneurial efforts but through a runaway system of tort (AW&ST June 10, p. 7).

The 90,000-plus Pipers built prior to Millar's acquisition of Piper were sold when parties could enter into a valid and enforceable contract defining liability and assuming risk. The tort revolution of the 1980s has retroactively voided contract law. In a recent fund-raising effort by the Association of Trial Lawyers of America (ATLA), the goal of plaintiffs' counsel in preventing the return of reason is clear.

"We are currently fighting for our living in the U. S. Congress. Product safety repeal legislation (the Kasten bill), which codifies products law and preempts all state common law, is a clear and present danger" (letter from Joseph P. O'Donnell, president of ATLA-New Jersey).

As for American aerospace entrepreneurship in general aviation, some companies are well prepared to resume American leadership of the industry when American political leadership removes the "clear and present danger" of a tort system out of control.

RANDALL GREENE
BETHANY, OKLA.

AVIATION WEEK & SPACE TECHNOLOGY

Sept 9, 1991

ence. Additionally, the FAA Practical Test Standards require competency in selected cockpit management areas during private pilot, commercial pilot, certified flight instructor, multi-engine, and airline transport pilot flight tests.

Private pilot applicants (airplane, single-engine land) must be evaluated on knowledge of cockpit management relating to safety and efficiency factors, efficient organization and arrangement of material, and crew coordination. Commercial applicants are similarly graded on efficient procedures for cockpit management and related safety factors.

Although competent flight instructors can teach flying's technical aspects (such as slow flight or ground reference maneuvers), management skills, such as organization, setting priorities, monitoring, and problem-solving are often missing. Even when these skills are taught, it is usually on a "hit-and-miss" basis—some students are well-trained while others receive little or no training. A more structured approach to CRM training can ensure that all students develop flight management skills.

One effective strategy is to promote CRM development throughout the flight training process while students are honing traditional psychomotor skills.

CRM ELEMENTS

A rudimentary CRM program should include these elements: communication, decision-making and problem-solving, situational awareness, standardization, leadership/followership, psychological factors, and stress management.

Communication as applied to single pilot operation includes improving both speaking and listening skills. Pilots must exchange information with a wide variety of people: air traffic controllers, flight service specialists, maintenance technicians, FBO personnel—and other pilots.

A useful publication for discussing communication problems is *A Call to Action: Joint FAA/Industry Partnership to Improve Pilot/Controller Communications*. Available from the FAA's Public Inquiry Center (APA-230, Washington, DC 20591) it described 12 areas of concern, including background and history, specific examples of the problem, and potential solutions/preferred techniques. Phraseology, radio discipline, stuck microphones, and read-back problems are a few of the areas discussed in the booklet.

Decision-making and problem-solving concern response to both "structured" (those having known dimensions and solutions) and "unstructured" problems (those with poorly defined circumstances and un-

known solutions). Strategies for choosing an appropriate course of action can be presented.

A six-step decision-making model has been developed at Ohio State University.

The steps of the DECIDE model are:

- D - Detect that a change has occurred.
- E - Estimate the significance of the change.
- C - Choose a safe outcome.
- I - Identify plausible actions to control the change.
- D - Do something.
- E - Evaluate the effect of the action.

A student taught to use these steps will consistently make better decisions. With practice and time, the steps will become second nature. Similar models can be used to teach problem-solving.

Situational awareness concerns knowledge of one's spatial location, error chain recognition (the sequence of milestone events preceding an impending accident or incident), consciousness of what is or is not occurring, and identification of clues signifying loss of situational awareness.

Cockpit resource management (CRM) is a means to effectively integrate pilot, aircraft, and environment for safer, more efficient flight

For example, let us say you are pilot in command (PIC) of a VFR aircraft being sequenced by radar approach control at a busy airport. You are told to descend and asked to maintain a higher than normal airspeed for separation. You also receive several heading changes and traffic advisories. Traffic behind your Cessna 172 is a rapidly approaching DC-9.

Approach hands you off to the tower. You cannot immediately talk with the tower

because of frequency congestion. Finally, on one-mile final you call the tower and are told to turn left and enter right base for an intersecting runway. You find yourself high, fast, and in an unanticipated position in the pattern.

Slightly confused, you fixate on the air-speed indicator and altimeter. Since you are fast, you must deviate from your normal sequence by extending flaps later and closer to the ground. While the landing will hopefully be uneventful, confusion, fixation, and failure to meet targets (airspeed, for example) suggest reduction of situational awareness and may result in an accident. Prior knowledge of these clues might avert a catastrophe.

Standardization training involves seemingly mundane yet vitally important issues, such as checklist discipline and procedural training. Have you ever flown with someone who did not use a checklist during the entire flight? Have you ever been in a hurry and started the engine for your student without accomplishing the "Before Starting Engine" checklist while telling your students to always use the checklist when they fly solo? Guess what? Your students will imitate you when they fly solo.

Standardizing checklist names and items among the aircraft in your fleet will aid in cockpit management. Transition to new aircraft or moving between aircraft will be much easier with standardized checklists. Students will be less likely to make errors.

Both "challenge/reply" and "flow" techniques should be discussed and practiced by the student. With challenge/reply, the pilot reads a checklist item and the response, then performs the task. By contrast, the flow method involves following a pre-learned pattern while using the checklist as a backup.

Leadership/followership style is a study of the desirable characteristics found in a good leader and follower. Leadership traits include technical and professional competence (knowledge of systems, regulations, weather, etc.), courage, enthusiasm, and flexibility. Communication skills, responsibility, humor, and ability to follow directions illustrate good followership.

A good leader will effectively manage those persons who contribute to the safety of the flight. Assuring that the lineman fuels the aircraft with the proper grade and quantity of fuel, verifying with the mechanic that maintenance write-ups have been cleared, and working with ATC when a clearance cannot be followed are but a few examples.

Some situations may require a pilot to be a good follower. As safety-conscious, responsible pilots, we must take the initiative to ask for help even when we are slightly

disoriented. Learning to speak up and following instructions will increase the chances of a safe landing.

Psychological factors in CRM training include attitude, personality, and motivation in the decision-making process. Attitude includes the cognitive (thought), affective (emotional), and behavioral (action or response). Hazardous attitudes such as anti-authority, impulsiveness, invulnerability, machismo, and resignation are studied.

As an illustration, consider the accident cited earlier involving a Beech *Sundowner* and low-level acrobatics. Feelings of invulnerability or machismo in reaction to a peer challenge may have precipitated this event.

Personality, by contrast, concerns individual style in coping with problems (e.g., the role of the "right stuff," "wrong stuff," or "no stuff"). The "right stuff" represents a balance between goal orientation, leadership, sharing, and interpersonal skills, while the "wrong stuff" implies autocratic, dictatorial traits combined with poor interpersonal skills and an inability to express feelings. "No stuff" suggests the absence of achievement motivation and leadership skills combined with verbal aggressiveness. Type A individuals who are overly competitive, time-dominated, and multi-phasic (able to perform several tasks simultaneously) sometimes tend toward the wrong stuff.

To further explain the role of personality, Air Force psychologists proposed the "Crash As One Lives" theory of aircraft accidents. It contends that milestone events preceding an accident occur in a tempo and fashion paralleling the pilot's lifestyle.

Students in single-pilot operations also need the "tools of cockpit resource management to address problems not contained on checklists or in flight

Motivation as it relates to internal and external factors should also be examined. Are individuals drawn to a goal by its attractiveness or are they driven by an outside stimulus to perform? For example, a non-instrument-rated private pilot continues on into what is clearly marginal VFR weather in order to arrive at an important business meeting. What motivations nurtured this risk-taking behavior? A personality assessment, such as the Strength Deployment Inventory, might also provide CRM students with insight regarding the reasons for their particular drives.

Stress management, the final area in a CRM training course, examines differing personal responses to stimuli and whether the response is "healthful" or "hurtful." Stress, the physiological and psychological reaction to demands placed on a person, may be either chronic (long-term) or acute (short-term). Short term stress might result from an argument, flying a difficult approach, or performing a non-standard cockpit procedure. Chronic stress could arise from career discontent, long term illness, or serious marital discord.

Indicators of inadequate stress coping include depression, withdrawal, denial, overcompensation, headache, appetite change, tardiness, and reluctance to accept responsibility.

Consider this illustration: A student pilot who has just worked 10 particularly frustrating hours at his daytime job must complete two hours in the practice area to be ready for a private pilot checkride at 8 a.m. the following day. After driving five miles through heavy traffic, he arrives at the airport with barely two hours of daylight remaining. His favorite aircraft, dutifully reserved for the flight, is in the shop having a new magneto installed. The mechanic says he needs just 15 more minutes, but it is getting dark. If the pilot cannot fly tonight the next available examiner slot is four weeks away.



Airline pilots flying light planes are on (their) own with no airline to do the work for them.

This person is experiencing stress that may result in an inappropriate decision. CRM training can help the individual recognize cues suggesting stress onset and provide coping strategies.

THE CFI's ROLE

Clearly, CRM training must not be limited to the corporate, commuter, or airline multi-crew environment. Students in single-pilot operations also need the "tools" of cockpit resource management to address problems not contained on checklists or in flight manuals. Flying requires considerable decision-making and judgement skill.

As instructors, we have contact with students through all phases of flight training and can act as role models during contrived and actual flight situations. The authors are convinced that students learn best by "doing" and "experiencing" under the guidance of their personal CFI's. It is imperative that the CFI emphasize sound CRM concepts both by example and illustration.

At Purdue University, flight and ground instructors are integrating CRM principles into all phases of the flight program. For example, structured methods for teaching decision-making are being developed for primary, commercial, and instrument students. Decision-making theory, strategies, and practice situations are contained in the following publications:

- *Aeronautical Decision-Making: Student and Private Pilot Manual*
- *Aeronautical Decision-Making: Instructor Guide for Student and Private Pilot Manual*
- *Aeronautical Decision-Making: Instrument Pilot Manual*
- *Aeronautical Decision-Making for Commercial Pilots*
- *Aeronautical Decision-Making—Cockpit Resource Management*

The first three documents may be purchased from the AOPA Air Safety Foundation. The last two are available from the Flight Safety Foundation (421 Aviation Way, Frederick, MD 21701) and the National Technical Information Service (5285 Port Royal Road, Springfield, VA 22161), respectively.

Checklist discipline and management skills within the cockpit are also being taught. A cockpit resource management course requiring active student participation is being offered. Video cameras are mounted in simulators to record student

performance and the interaction with ATC and other crew members. A CRM training seminar for instructors will be offered in the near future.

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Number 145

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BIG LESSONS IN SMALL COCKPITS

EDITOR'S NOTE: *Complimenting the preceding article is one that appeared in Callback, NASA's monthly bulletin from the Aviation Safety Reporting System (ASRS).*

Air carrier and light plane pilots may appear to have little in common except the airspace they occupy. Yet a number of airline pilots enjoy flying small planes in their off-duty hours. Going from a big cockpit to a smaller one can offer some meaningful "on-your-own" lessons, according to several airline pilots recently reporting to ASRS.

- On a long night flight only one hour from my destination, as I adjusted my seat and body position, I inadvertently knocked off the avionics switch. This shut down all communications and navigation. I realized the problem very quickly (two minutes or so) and reactivated the avionics switch. As Murphy's law would have it, Center called me four times during my brief absence from the airways. The controller proceeded to remind me to listen up. I guess I can't blame him!

... In the future, I will be more careful when adjusting seat and body position in a small aircraft... [and] be extremely careful when moving around in tight cockpits. Also be alert for important switches that can be easily moved whenever you change body positions... Be especially careful for circuit breakers, autopilot, and avionics switches.

- The controller advised me that my track was 40 degrees to the right of the headings he was giving me. He advised me to recheck my compass and directional gyro. Sure enough, they were off. I corrected and continued to the destination without incident.

The lesson learned here was a back-to-basics reminder. Every 15 minutes or so you must check directional gyro against the compass. As an airline pilot flying jets, this task is accomplished automatically, so it's easy to forget. Once again, airline pilots be careful when flying small airplanes. Review the basics and be prepared to use them!

- While discussing the weather conditions and filing my IFR flight plan with the FSS briefer, I forgot to give an alternate. My destination had a chance of weather conditions that would require an alternate but current weather was much better than had been forecast...

The factors leading up to the oversight included:

- 1) Normally, as an airline pilot I don't get involved with dispatch and flight planning...
- 2) Not writing out an IFR flight plan in advance. Instead, just reading off a blank form giving most of the info from memory... Airline pilots flying light planes are on [their] own with no airline to do the work for them.

EAA OSHKOSH '91 "TRIVIA"

- 30 on-site food outlets dispensed: 162,983 sandwiches (including 71,784 hamburgers/cheeseburgers, 37,368 hot dogs and 11,673 brats); 49,822 french fries; 20,347 pizza slices; 339,460 beverages (including 257,453 Coke products); and 105,393 desserts.
- 9.8 miles of snow fence utilized, 9,800 fence posts erected.
- 45,000 feet of banner rope and 4,500 posts set up for safety reasons.
- 739 portable toilets serviced at least six times daily (EAA is Waste Management's largest international client).
- 13,440,000 sheets of toilet paper.
- 386 business and pay phones activated (world's largest temporary installation of phones, according to Wisconsin Bell and AT&T).
- 5,000+ EAA volunteers provided more than 200,000 people-hours in preparing for and administering the 1991 EAA Fly-In Convention (including almost 400 volunteer Chairmen and Co-Chairmen).
- 491 commercial exhibitors rented more than 1,000,000 square feet of exhibit space.
- 1,250 temporary employees hired by EAA, Zaug's Food Service, suppliers, commercial exhibitors and FAA.
- 12,000 airplanes visited the Convention, including nearly 10,000 transient aircraft and more than 2,000 showplanes (Homebuilts, Antiques, Classics, Aerobatic aircraft, Warbirds, Light Planes, Ultralights, Rotorcraft, Seaplanes, etc.).
- 41,228 air operations recorded by FAA Tower (airport closed prior to Opening Day, remained closed for much of the weekend and closed again on Tuesday, July 30, due to saturation of aircraft.)
- 44 FAA Air Traffic Controllers worked the 1991 EAA Fly-In Convention (11 on staff at Wittman Regional Airport supplemented by 33 "gypsy" Controllers).
- 40,000 EAA members and their families stayed in EAA Camp Scholler.
- 81 nations represented in EAA's International Visitor's Tent (2,084 total registered guests).
- 1,021 media representatives registered at EAA Press HQ.
- 256,489 people were transported throughout the Convention site (158,209 by 28 shuttle buses and 98,280 on EAA Trams).
- Vehicles loaned by: Buick Motor Division (100 cars); GMC Truck Division (30 vans and (pick ups); John Deere Co. (150 AMT626s, 18 lawn tractors and 3 farm tractors).

The Passing of the Convair 990

by G.C. Kehmeier



The last Convair 990 landed at El Paso International Airport in September 1991 after a flight from Europe. Captain Ralph Clark of Aurora, Colo. was at the controls.

N8357C was the 24th 990 built by the Convair Division of General Dynamics. American Airlines took delivery on 9 April 1962. Later owners were Northeast Airlines, Peruvian Airlines, Ports of Call-Denver and Ciskei International Airlines.

Convair sustained a loss of \$425 million on its 880 and 990 models. The death of the company's founder at a critical time and entanglements with the elusive Howard Hughes caused the huge loss.

The Convair 990 was a good airplane. Ports of Call loaded them with 146 passengers, 6,000 pounds of baggage and 52 tons of fuel. The weight was slightly under the maximum structural limit of 353,000 pounds. Honolulu to Denver in 7:25 hours was an ideal trip.

In the close-in knife fighting of marketing airliners, Convair lost out when United Airlines bought 29 Boeing 720s in 1960. Convair's problems were compounded by the capricious Howard Hughes, who preferred to conduct negotiations by flashlight on the Palm Springs garbage dump at 2 a.m. The 880 was ready by Christmas of 1958. Shortly thereafter American wanted a larger and faster model. It ordered 20 of the 990s.

At the time, the 990 was built it was advertised as "the fastest airliner in the world, cruising at 640 miles per hour" and "the only jet with a fan engine." When Convair finally got it flying on 24 January 1961, it was about 40 miles per hour slower than advertised and American did not want it. Convair then had to rework every 990, re-designing the wing leading edge slats, moving the outer engine pods back, streamlining the engine pylons, altering the engine nozzles and fitting a new fillet where the wing joined the fuselage.

The most noticeable modification of all was the addition to the back of the wings of four fat, cigar-shaped bodies known as Anti-Shock Bodies. These were the first

application of the area rule which states that not only is the cross-sectional area of the aircraft important in determining its drag, but also near the speed of sound the rate at which the cross-sectional area changes from the aircraft's nose to its tail is important. The Anti-Shock Bodies filled the area gap between the wings and the tail.

This brought the cruise speed of the 990s up to within 15 mph of the target speed and American accepted its order of 20. Varig (Brazil) and Garuda (Indonesia) each bought three. Swissair took six, ASPA (Peru) and SAS (Scandinavian) each bought one.

Used 990s were purchased by Spantax (Spain) and used on domestic routes. Modern Air Lines flew the convair from Berlin to Malaga, Canary Islands, Athens and Rhodes, hauling German tourists from fog-bound Berlin to the sunny beaches of the Mediterranean.

When Modern Airlines went broke, Ports of Call bought six of their 990s. Captain Ralph Clark flew from both Modern and Ports of Call, amassing a total of 12,500 hours in the 990 over 25 years – a record for time in that type.

Of the 38 990s built, ten were destroyed in the air or on the ground and 27 were scrapped. N8357 Charley, now parked at El Paso, is the only one with a current Airworthiness certificate.

N5601 was delivered to American Airlines on January 18, 1963, resold to Middle East Airlines on September 19, 1969, was repossessed and sold to Modern Airlines in 1970. Ports of Call bought it for parts in June 1976. The hull now houses a restaurant and lounge at Tri-County Airport in Erie, Colo.

The author flew the Convair 990 from 1973-1978.



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