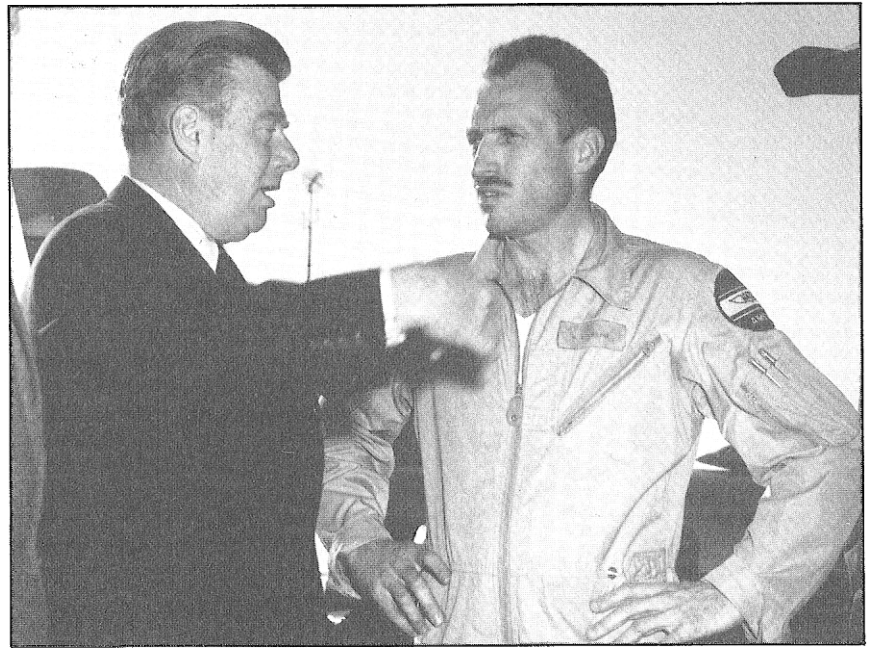
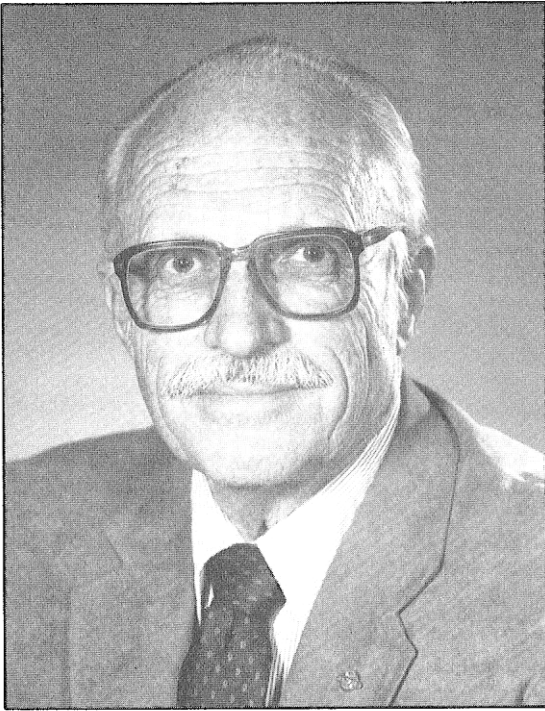


The Aero Club of Northern California

1990 Award Winner **George S. Cooper**





Until his retirement, Mr. Cooper was NASA Ames most distinguished research test pilot and remains one of their most honored alumni.

His research project on human resource management in the cockpit achieved international attention and national funding to address urgent human factor problems associated with airline flight crews. Today, human resource management on the flight deck, i.e., interpersonal relationships, communication, crew coordination skills, responsibilities of captain and crew, has become one of the principle training elements (both initial and recurrent) within the airline industry.

Mr. Cooper did the initial research development of the cockpit human resource factors (after which NASA brought in a lot of Ph.Ds and psychologists to prove his research correct).

It was George Cooper whom the FAA turned to in 1965 to evaluate handling qualities of seven hi-performance general aviation business jets and potential for accidents because they were experiencing abnormally high accident rates. His research on these aircraft lead to the use of his technical reports by both the Air Force and Navy's test pilot schools.

He retired after 28 years as Research Pilot at Ames because it was becoming more and more difficult to fly or even engage in specific research programs and he felt that a somewhat early retirement would make it easier to continue to make some contributions. While we had made some progress in Flight Operations since your day in additional support, it was still a highly filtered chain of command. As a result, he found himself trying to manage flight operations, increasing documentation and paper work, increasing concern and visibility of safety considerations with insufficient support. Dr. Mark's comment to him upon learning he was retiring was "Why did you do that George? Now we have to reorganize!"

He agreed to continue for one year as a consultant to the Director with the task of working out a reorganization plan. The result was a new Flight Operations Division which included those Branches (Maint., Insp., Instr. etc.) which should have been together in the first place. They also included a small Airworthiness Engineering Branch to handle all airworthiness matters, particularly modifications to the aircraft and the technical supervision of the inspectors. Previously he had obtained a couple of engineers to help him in this regard and then had obtained some indirect control over airworthiness and safety by creation of an Airworthiness and Flight Safety Board, of which he was chairman. Unfortunately, most of his pilots either wanted to fly, with little interest in collateral duties without management recognition or else wanted to be the boss and direct the subordinates we didn't have to do the nitty gritty work. By means of reorganization, his duties were ultimately divided three to four ways. He've include the above only because he know you would be interested to know how difficult and long it took to get solutions to organizational problems which was recognized years before. Probably he should have been more vociferous earlier but he think the philosophy was "If it works don't tinker with it". Also, maybe now he would agree with a remark attributed to Harry Goett years ago. "George Cooper has the best job in NASA".

The major dividend he got from retiring in 1973 and then working an additional year was the opportunity to help develop a new NASA program within the Life Sciences Directorate. Dr. Charles Billings and Dr. John Lauber, a flying M.D. and psychologist came on board in 1973 and as Charlie and he knew each other from earlier contacts, he sought him out for help in developing the Program which became known as the "Aviation Safety and Human Factors Research Program".

2

Know ye by these presents that the

MACH DEUCE

rating in the Royal Order of Starfighters
has been conferred upon:

Capt. George Cooper

for flying twice the speed of sound in the F-104

Witnessed: *Peter Mungro*
Lockheed Field Service Representative

George S. Cooper

He believe his guidance and effort was to a large extent, vital to the success of this timely program which ultimately became highly visible to Congress with the result that the HF budget was increased immensely. They then hired lots of Ph.D's and psychologists, but not before he was able to initiate and conduct a number of significant research projects. The first was a program with the airlines, particularly *Pan Am*, which enabled them to use the trust and confidentiality which NASA enjoyed with industry, to hold voluntary confidential interviews with airline pilots and flight engineers. This enabled them to identify the most *urgent human factors problems* associated with airline flight crews and to initiate appropriate research to address them. This included a study of the problems and potential solutions with Cockpit Warning and Alerting Systems, another in developing scenarios for Full Mission Simulator research studies, a third was the conduct of a comprehensive flight simulation study with airline crews which examined the human factors of crew interaction and performance under realistic flight conditions, and fourth, initiating an effort to establish a nationwide human factors incident reporting system,

(this was successfully implemented at Ames with the support of the FAA and became known as ASRS, Aviation Safety Reporting System.)

In 1979, George conducted a worldwide study of airline training programs with respect to the human factor problems previously identified. The conclusion from this study led him to the planning, preparation and implementation of an International NASA/Industry Workshop which was held in San Francisco, June 26-28, 1979. It was entitled "Resource Management on the Flight Deck" and provided resource material and the stimulation to many of the world's major airlines to plan and initiate new training programs covering human factors, (interpersonal relationships, communications, crew coordination skills, special responsibilities of captains, first officers, etc.) Unfortunately deregulation and the increased competition caused many airlines to put their programs on the back burner but some, notably United Airlines developed a program which was subscribed to by many of the airlines which did not pursue their own programs.

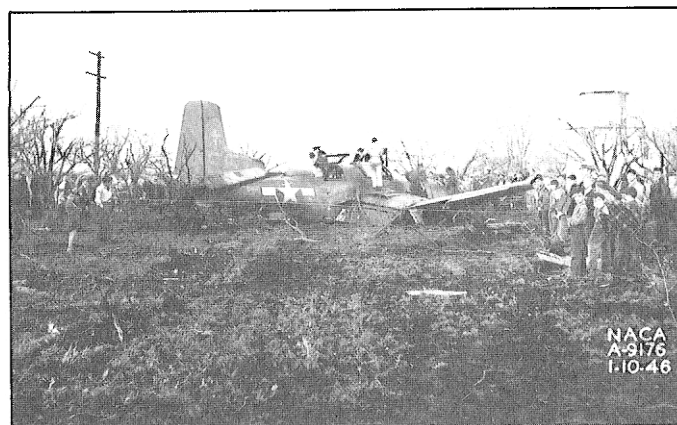


During a 14 month period in 1967-68, NASA, (exclusive of Ames) had 8 major aircraft accidents, several of which involved astronauts. This caused Congress to take an interest in NASA's Aviation Safety Program -- which was non-existent except for the individual Center Flight Operations approaches to safety. (A throwback to Mel Gough's mania for not having any written standards because they might compromise your freedom.) After turning Headquarters down repeatedly in their efforts to get him to become Director of Aviation Safety, he began to see that if someone couldn't be found within NASA, there was a strong possibility that the military might be given the task of directing our flight operations. As a result, he agreed to take the job on a part time basis. In the following 18 months he established a program with dissemination and exchange of safety information, training, and intercenter safety reviews. In addition they made a significant start on a handbook of NASA-wide standards for aircraft operations and safety. They then hired a former Navy Captain and test pilot who had been active in the Space Program to take the job and he returned full time to Ames. At least the flight safety record improved dramatically and they got people thinking in terms of increased safety awareness. Headquarters support has since run hot and cold, similar to what happened with the Space Shuttle.

The development of the high performance jet fighters with swept and low aspect ratio wings resulted in higher approach and landing speeds and more approach and landing accidents. Ames initiated comprehensive wind tunnel and theoretical programs looking at boundary layer control and other high lift techniques for solutions. We documented and evaluated many aircraft modifications in order to validate these wind tunnel results and to understand better the design requirements for good approach and landing characteristics. One research program which emerged from these flight studies and for which he had a prime responsibility was the development of design criteria for the Carrier Approach of Navy aircraft. This involved the evaluation, documentation and correlation with design criteria of over 40 different fighter aircraft in the approach and landing. The Navy provided them with a different aircraft every two months during which time it was instrumented, thoroughly evaluated then returned, making way for the next one.

The in-flight modulating thrust reverser program was his from inception to completion even though he got Seth Anderson to participate as project engineer. Following their flight program, they responded to the industry's request for an extensive evaluation by a cross section of airline, military, FAA and management pilots.

The development of flight simulation as an effective research tool was a difficult and painful experience for those of who had to extrapolate their evaluations because of the limitations and inadequacies of the early simulators, primarily the ground based simulators. Ames was a pioneer in simulator development beginning with the first variable stability research F6F in 1947, the brainchild of Bill Kauffman. Their earliest ground based research simulator was a modified Link trainer. The following 15 or so years saw gradual sophistication, realism, accuracy and validity but it took a lot of test pilot extrapolation and guidance before simulators reached the point where they were "fun to fly." Early use of the TV tube for example, enabled the use of simple symbology to represent the aircraft, horizon, attitude, pitch rate, and height rate, with of course airspeed and a couple of other parameters provided. Pilots were then expected to and then proceeded to try and evaluate the effect of changes in various parameters on the aircraft handling and response characteristics. The manufacturers development simulators as well as NASA's research simulators as you know are now used as effective design tools.



Eighth Annual Awards Presentation

The Aero Club of Northern California

April 7, 1990

San Jose, California

Welcome and Introduction Thomas E. Leonard
President
Introduction of Guests Jerome T. Bennett
“Lifetime Achievement” Awards James Nissen

DINNER

Presentation of Aero Club of Northern California’s
“James M. Nissen Scholarship Award” Steve Sullivan
Chairman - Scholarship Committee
Guest Speaker George E. Cooper
Crystal Eagle Award Presentation Thomas E. Leonard

The Crystal Eagle Award

The Aero Club of Northern California Crystal Eagle Award is presented annually to recognize and honor an individual who has made an outstanding contribution to the advancement of aviation or space flight.

The Crystal Eagle: A distinctive work of art

The Crystal Eagle Award is a unique work of art crystal handcrafted in Sweden.

It is fitting that the eagle should be the symbol for the Aero Club’s annual award. The North American eagle is recognized as a bird possessing great strength, natural grace, keenness of vision and power in flight. The eagle has been used by man to identify with flying since its inception to our current successes in space.

The crystal reflects the medium of flight -- transparent, yet ever present.

The Crystal Eagle is mounted on a California redwood base, unique to Northern California. In its natural state redwood has unusual durability, commensurate with the recipients of this coveted award.

Crystal Eagle Award Winners

- 1983: General James “Jimmy” Doolittle
- 1984: Brigadier General Charles E. “Chuck” Yeager
- 1985: Stanley Hiller, Jr.
- 1986: William “Bill” Lear, Sr.
- 1987: James M. Nissen
- 1988: Anthony W. “Tony” LeVier
- 1989: Elbert “Burt” L. Rutan



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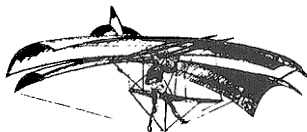
The Aero Club of Northern California was formed to promote those activities which advance aviation and aerospace within Northern California.

We are a chapter of the National Aeronautic Association, (NAA) which is the oldest independent, non-profit aviation organization in the United States, and the sole U.S. representative to the Federation Aeronautique International.

We embrace the goals of our parent organization in our efforts to support a vigorous aviation and space program for students at all levels of learning, and to recognize and honor those who make outstanding contributions to the advancement of aviation and space flight.

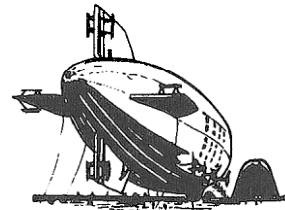
About our logo ...

Incorporated in the logo of The Aero Club of Northern California are some of the most significant contributions the area has made to the art and science of flight.



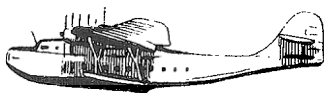
Montgomery Flight - 1904

Often referred to as "The Father of Basic Flying" Dr. John Montgomery was a true aviation pioneer. San Jose was the site of many of his historic achievements. Alexander Graham Bell noted that, "All subsequent attempts in aviation must begin with the Montgomery Machine."



Moffett Field - 1933

Dedicated April 12, 1933, Moffett Field continues to be the United States guardian of the Pacific. It is a part of northern California's defense commitment to aviation.



China Clipper - 1936

Lifting from San Francisco Bay waters on November 22, 1935, the Clipper became the first airplane to fly the Pacific non-stop. Cutting over 15 days off the best surface time from San Francisco to Manila it led to the elimination of the barriers of space and time.



NASA Ames Research Center - 1982

Northern California's continued contributions to involvement in man's quest for his ultimate destiny is assured by the ongoing advancements in aerospace technology at NASA's Ames Research Center.