

A Reflection on Events—Present and Past

AS you can see from the cover, we also have a new name. Although the subject of dynamics has been within our scope from the beginning, it now will benefit from a prominent space at the top of each cover. AIAA members among our readers should be comforted by the observation that this change is a testimony to the fact that the society hierarchy is capable of both listening and acting. The name change is entirely the result of an active group within the membership (the dynamicists) gathering together to make their wishes known to their elected officials and committee representatives. Beginning with this issue, they have the formal recognition they sought for their contribution to this publication. Their support in the form of paper submittals has been strong. I challenge them now to fulfill their many promises that, with the new title, it will become even stronger.

As you can see from the above, member and reader feedback is important to us. In the year just completed, we tried two new concepts: a special issue dedicated in part to one subject (Guidance and Control of Tactical Missiles), and History of Key Technologies papers offering a noteworthy individual's recollection of important developments in our technology. The latter were established as part of AIAA's Fiftieth Anniversary Year. Several more are planned. Two more special issues are in progress: one on the control of large space structures, the other on guidance and control of remotely piloted vehicles. Each will include a survey paper and will have a practical applications orientation. The Applications Advisory Board to this journal, at its last meeting, voted unanimously to continue both concepts. What do you, the reader, think? If you disagree or have other ideas, let us know. If you agree, please write in with suggested topics in both categories.

For those of us responsible for the editing and operation of this journal, the History of Key Technologies papers have brought some unusual pleasures. I'd like to share with you two such incidents. The first involves the founder of my Laboratory—Dr. C.S. Draper. After his History of Key Technologies paper appeared in the September-October issue, I walked down the hall to his office to personally thank him for the not insignificant effort involved in creating the paper. After listening to him assure me that it was "easy" and that he was grateful to record material that in the early days was unpublishable for security reasons, I asked him to identify the man pictured with the early Ship's Inertial Navigation system in Figure 17 of his paper. He told me that it was Harold Brown from the machine shop. Then, with a devilish grin and a twinkle in his eye, he said that Harold was a "big fella." I have since learned that "big" means about six feet seven. He was the tallest person in the Laboratory and it was no accident that he could make the inertial navigator look smaller than anyone else available. The pioneers had a sense of purpose, which was evident even in their style!

The second example I offer as Figures 1 and 2. After McRuer and Graham published their article entitled, "Eighty Years of Flight Control: Triumphs and Pitfalls of the Systems Approach," in the July-August issue, I received a letter from Col. Carl J. Crane (USAF-Ret) bringing to my attention his own pioneering work in the automatic landing of aircraft. Figure 1 is a 1937 clipping from the *Dayton Journal* describing his accomplishment (and also underscoring the danger of predicting the future!). Figure 2 is a photostat of the government form filled in by the then Lt. C.J. Crane seeking authorization and funding for the work. Our society has made great progress in the ensuing forty-five years, but not in all areas. Consider how much any of us today would bid on a job to "study equipment for automatic flight and

First Automatic Landing Achieved by Army Airmen

Successful Tests Climax 2 Years of Research.

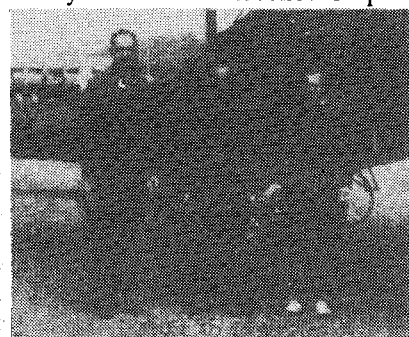
Fly Machine-Controlled Ship

Two years of intensive study by three Wright field men reached a climax Monday evening when an army air corps cargo-type plane made what is believed by officials to be the world's first entirely automatic landing. It was revealed Tuesday.

Capt. Carl J. Crane, director of the instrument navigation unit of the equipment branch; Capt. George V. Holloman, who has been flight testing the new device for the last six months, and a civilian, Raymond Stout, project engineer on automatic landing development, were only passengers when the plane landed at Patterson field. Captain Crane designed the equipment, but the trio have been working together to develop it to the flight stage.

With the Sperry gyro pilot flying the airplane headed in a southerly direction, the master automatic landing switch was closed over Dayton and not a hand touched a control until the plane had made the final roll headed north on the runway at Patterson field, where portable ground radio equipment in trucks was stationed. Corp. Carl Muller and William Cummings assisted with ground equipment but had no part in controlling the plane.

The new device, a continuation of blind landing systems, shows promise of eliminating the possibility of human error in airplane landings under poor weather conditions. The air corps expects to conduct further experiments with the equipment to the end that additional refinements will make automatic landing an every day occurrence in good weather, as well as in bad. The device is said by engineers to be better suited for



CRANE HOLLOMAN "To Remove Human Element" STOUT

larger type planes and is believed adaptable for three-wheel landing gear construction, also in its primary development stage.

Engine speed, angle of descent, allowance for wind drift, turning and necessary "banking" are controlled by the combination of radio and electro-mechanical impulses, officers asserted.

The new mechanism differs from the British "Queen Bee" system and other semi-automatic landing devices that require human assistance either inside or outside the plane. Air corp officials said their experiments and research have been conducted in order to arrive at fully automatic landing that removes the human element from the procedure of landing through fog and other adverse weather conditions which prevent visual contact from the airplane to the ground or ground to plane.

With the exception of the gyro-pilot, all of the equipment was designed by technicians at Wright field.

Fig. 1 Clipping from the *Dayton Journal*—August 25, 1937.

Ref. Div. 446-Wright Field 9-31-54-5M Instrument & Nav. Unit		Authority for:	<input checked="" type="checkbox"/> A. Study <input type="checkbox"/> B. Design <input type="checkbox"/> C. Fabrication <input type="checkbox"/> D. Test	Expenditure Order No. 65-1-477
AILS OF WORK AUTHORIZED (Make definite and concise):			Account No. 7-05A	I-4-508
To study equipment for automatic flight and landing, including design, fabrication and test of essential components.				
II. FILL OUT ONLY PARAGRAPHS ON ITEMS CHECKED ABOVE.				
A. STUDY. a. If development of equipment is proposed, is it new, modified, or for substitution? b. Why necessary? c. State complete program proposed with probable total cost as estimated before study is made. d. Give in detail work to be covered by this study. e. Indicate character of report of this study which is to be prepared.				
(See attached sheet)				
B. DESIGN. (Copy of Report on Study to be attached.) a. Type designation recommended. b. Kind of drawings to be prepared. c. What test items will be constructed and tested during development?				
FABRICATION. (Attach assembly drawing of item or fabrication instructions.) a. What new or modification of present manufacturing equipment at the Division is necessary. b. List outside purchases required and estimated cost.				
D. TEST. (Attach test requirements.) a. What kind of report is required? b. What new test equipment will be needed?				
III. PERSONNEL. a. Name of Project Engineer. Mr. C. J. Crane b. List of Branches which will be required to do work. Equip. Tech.; Repair Shop; Aircraft Section.				
IV. ESTIMATES. (For items checked above). Overhead omitted				
a. Material	b. Eng. & Drafting Labor	c. Fabrication Labor	d. Test Labor	e. Total Cost
\$ 10,000.00	\$ 5,000.00	\$ 5000.00	\$ 100.00	\$ 21,000.00
V. ENGINEERING PROGRAM. a. State Project and Item Number on Engineering Program. 65-1 b. If not on Program state modification proposed.				
Initiated by Lt. C. J. Crane Branch Instrument & Nav. Unit Date 1/1/55 Coordinated by _____				
Approved _____ Approved _____ Chief _____ Section Chief _____ Executive _____ Major, Air Corps 1st Col., Air Corps Colonel, Air Corps				
Close out requested (Date) _____ Reason _____				
Signed _____ Approved _____ Branch Chief Section Chief				

Fig. 2 Lt. Crane's funding authorization form.

landing, including design, fabrication and test of essential components" —certainly not \$24,000! Also, can you imagine being able to seek such work and have it approved with only one page of paperwork?

Turning once again to more routine matters, if you examine the masthead you will observe that membership on the Applications Advisory Board has rotated. Fred Krachmalnick and Earl Hall have completed tours of duty with their parent technical committees and thus on the Advisory Board. They have both been very helpful in working on issues which strengthen our applications orientation, and will be missed. I would like to publicly thank them for their considerable efforts on behalf of this journal. Replacing Dr. Hall as the representative from the Atmospheric Flight Mechanics Technical Committee will be Dr. Marle D. Hewett, manager of Flight Control Research for the Northrop Corporation Aircraft Group. Mr. Krachmalnick's successor as the

representative from the Guidance and Control Technical Committee will be Dr. George Meyer, research scientist at the NASA Ames Research Center. This year we have also added our first member-at-large—Dr. Sherman Seltzer, President of Control Dynamics, Inc. Dr. Seltzer was one of the organizers of our special issue on guidance and control of tactical missiles and is performing a similar duty for the upcoming special issue on large space structures. He has been very active in support of this publication. I look forward to working with all three new members over the next several years.

Finally, as I always do in this annual editorial, let me call your attention to the list of names which follows. These are the reviewers who served us this past year in an anonymous fashion. Without them, the peer review process which is the foundation of this journal and all other archival publications would not be possible. I once again salute them for their efforts.

Donald C. Fraser
Editor-in-Chief