NOVEMBER 1962

UNITED STATES ARMY AVIATION DIGEST

OV-1 (AO-1 MOHAWK)

CV-2A (AC-1 CARIBOU)

UH-1 (HU-1 IROQUOIS)

CH-47A (HC-1B CHINOOK)

U-1A (U-1A OTTER)

OH-13 (H-13 SIOUX)

CH-21 (H-21 SHAWNEE)

U-8 (L-23 SEMINOLE)

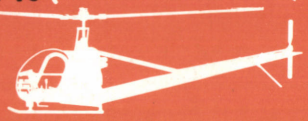
O-1 (L-19 BIRD DOG)

CH-37 (H-37 MOJAVE)

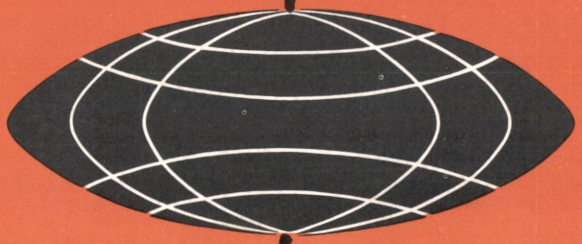
U-6A (L-20 BEAVER)

UH-19 (H-19 CHICKASAW)

CH-34 (H-34 CHOCTAW)



OH-23 (H-23 RAVEN)



NEW DESIGNATIONS FOR ARMY AIRCRAFT

Page 3

UNITED STATES ARMY AVIATION DIGEST

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NOVEMBER 1962 VOLUME 8 NUMBER 11

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The mission of the U. S. ARMY AVIATION DIGEST is to provide information of an operational or functional nature concerning safety and aircraft accident prevention, training, maintenance, operations, research and development, aviation medicine, and other related data.

The DIGEST is an official Department of the Army periodical published monthly under the supervision of the Commandant, U. S. Army Aviation School. Views expressed herein are not necessarily those of Department of the Army or the U. S. Army Aviation School. Photos are U. S. Army unless otherwise specified. Material may be reprinted giving credit to the DIGEST and to the author, unless otherwise indicated.

Articles, photos, and items of interest on Army Aviation are invited. *Direct communication is authorized to: Editor-in-Chief, U. S. Army Aviation Digest, Fort Rucker, Alabama.*

Use of funds for printing of this publication has been approved by Headquarters, Department of the Army, 27 November 1961.

To be distributed in accordance with requirements stated in DA Form 12.

LETTERS

Sir:

I am grateful for the copy of the U. S. ARMY AVIATION DIGEST which contains Part I of "The Army Aviation Story."

I'm glad that the material I supplied was helpful, and I look forward with pleasure to seeing the other issues that deal with this subject.

MARK W. CLARK
Gen, USA (Ret)

Sir:

It is with a great deal of interest and pleasure that I write this letter, which is occasioned by my having just completed reading the very fine article in your June 1962 issue entitled "The Army Aviation Story" by Mr. Richard K. Tierney, a member of your editorial staff.

Having had a considerable amount of experience in the subject of light aviation for Field Artillery, and having believed in this project thoroughly since 1937 when Capt John K. Burr (now deceased) and I first commenced experiments from Stinson Municipal Field here in San Antonio, Texas, I submit the following information.

We were then both members of Field Artillery, Headquarters Battery, 61st Field Artillery Brigade, 36th Infantry Division, Texas National Guard commanded by Major General Claude V. Birkhead.

Upon several occasions Captain Burr and I would rent a civilian type Piper Cub airplane, of which I was the pilot, and then conduct tests from it in the operation of the Walkie-Talkie radio, having a set in the airplane and other sets in jeeps or trucks on the ground at various distances and behind obstacles such as hills or buildings or in the open to ascertain just how far and well communications could be established between the airplane and ground stations.

Later in 1940, 1941 and again in 1942 experiments were conducted at Camp Bowie, Brownwood, Texas, with two Piper Cubs under the command of Brigadier General R. O. Whittaker, one flown there by Mr. W. T. Piper, Sr., and one by Mr. T. I. Case, which were used to conduct many tests of all descriptions by these two gentlemen, myself and others. I also secured, at a later date, in 1942, a civilian type Piper Cub then owned by Major [John] Garner, one of the officers on duty at Camp Bowie, and flew this airplane from Shreveport, La., to Camp Bowie, where we flew many Field Artillery officers as eobservers for conducting artilery Fire with 155mm guns on the Artillery Range near Camp Bowie.

We also conducted various field tests, located command posts from the air, directed military traffic and convoys, and worked very closely with Mr. Piper and Mr. Case as mentioned in your article, collecting all types of data as to maintenance of aircraft, etc., which was then tabulated and sent to Mr. Piper and through him to the proper authorities in the War Department.

* * *

Having noted in your story that my name appears on page 15 [June issue] as 1st Lt. James McCord Watson, III and in two other places as Lt. Watson and page 17 as Captain Watson, I am interested to know where you received this information about me. Actually the correct name is Joseph McCord Watson, Jr., and I am now in the retired reserve as Lt Col, Field Artillery, and reside at 2222 Briarwood, San Antonio 9, Texas.

I have given you briefly a part of the early history of light aviation, which I trust will be of some benefit at a later date to those who will carry on this very important work in the services of our country.

JOSEPH McC. WATSON, JR.

Sir:

Thank you for sending me "The Army Aviation Story" . . .

The first installment of TAAS made very interesting reading. Someone did a lot of research to bring up so much detail of all the "Army Aviations" which have come and gone. I had never thought of treating the several pieces as episodes of a single story, but actually there is one thread which continues through the whole business: the constant search of the Army for air observation and other services.

I found no errors of fact, nor any distortion of picture. . . .

Best wishes to all the oldtimers at Rucker!

W. W. FORD
Brig Gen, USA-Ret.

Sir:

Six months ago, I was rotated to ground duty and had forgotten just what I was missing by not getting the DIGEST regularly until this last month when I was visiting an aviation unit to obtain my proficiency time and picked up the August edition.

If it is at all possible to get on a direct mailing list I would certainly appreciate it as the unit to which I am assigned does not receive the DIGEST. If this is possible and you still have back copies of all of this year's publications they would be heartily welcomed.

Please keep up the good work of getting the news to the field. Thank you very much.

HORACE M. SMITH, Lt
Company E, 1st BG, 9th INF
APO 731, Seattle, Wash.

Our distribution system is set up to cover just about any assignment or circumstance that may arise, including ground duty. Use copies of DA Form 12 and 12-4 to request initial distribution if your unit is not receiving copies of the DIGEST. Turn your unit requests in to your local AG Publications Officer and he'll do the rest.

As for back issues we are happy to furnish them on a first come, first served basis. Our supply of some back issues is exhausted, but we'll furnish whatever we can.

Sir:

At the risk of opening old wounds and adding further recrimination I would like you to publish this in your letters section.

In reference to Captain Paul B. Malone's article "Above the Gauntlet," August 1962 issue. An inference can be drawn that the 2d Infantry Division aviators were not effectively reconning and reporting enemy strengths and movements. This could not be further from the facts. The facts are that I had returned from Unchon (D.S. 1st ROK Division) on 23 November 1950, soon after the defeat of the 8th Cavalry Regiment, 1st Cavalry Division and the 1st ROK Division by Chinese Communist Forces. On my return to division headquarters, I made a comprehensive report on the massive movements of Chinese forces toward the Chongchon river from the north. In the following days our division aviators continued to report large movements of Chinese forces to the front and sides of the division area. These reports were submitted to G-2 by direct telephone line from the airstrip and to a G-2 officer located at the airstrip. The reports included and identified as Chinese the "mystery column" moving westward around the division, erroneously accredited to the Air Force.

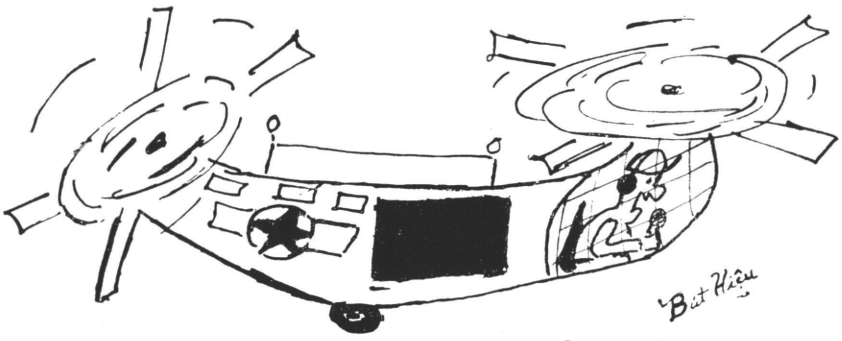
It is as simple as this—the Army Aviators knew what was happening and were factually reporting the information. The blame has long ago been assigned to the failure of intelligence interpretation and aggressive command action. The facts were well known to Captain Wilford A. Baugh, Jr., myself, and other aviators of the 2d Infantry Division as we rode, walked and fought over the "Pass" and through the "Gauntlet."

BARTON F. RICHARDS
Major Infantry

Sir:

Army Aviation's mission in Vietnam is such that when an CH-21 [H-21] takes off, there is some doubt that it will return. Therefore, this appropriate cartoon drew a chuckle or two when it appeared in the weekly MAAG/MACV "Observer."

CAPT J. H. HOOK
Army Avn Div,
USASEC MAAG
APO 143
San Francisco, Calif.



"Hey, Mister Tally-man, tally my banana."

Aircraft Designations

AR 700-26 Dated 18 September 1962

William H. Smith

"Roger, Army 59853, say again aircraft type. Over."

"This is Army 59853. Aircraft type is CV-2A. . . repeat, CV-2A. Over."

No, our intrepid throttle jockey friend has not lost his marbles; nor does the Army have a new type of aircraft in its inventory. The CV-2A is the familiar de Havilland Caribou under its new designation.

A new system of aircraft designation is now in effect and gives new designations to many Army, Navy, and Air Force aircraft. Army Regulation No. 700-26, dated 18 September 1962 (Navy BuWeps Instruction 13100.7 and Air Force Regulation No. 66-11), spells out the new titles and converts most familiar designations such as H-13H and L-19A to the new and unfamiliar designations OH-13H and O-1A.

Redesignations are effective now. Documents will not be fully converted until revisions other than designation changes are needed. Pen and ink changes will suffice, but *new covers* will be obtained for affected documents.

Here's how the new designation system works.

YCV-2ADH

Status Prefix Symbol — Basic Mission and Type Symbols — Design Number and Series Symbol — Manufacturer's or Source Code Letters

The status prefix symbol in this case is *Y* and means the aircraft is a prototype. Other status symbols to be used are: G—permanently grounded; J—special test, temporary; N—special test, permanent; X—experimental; Y—prototype; Z—planning.

The basic mission and type symbols indicate the primary purpose of the aircraft. In this case it is *CV* and means the aircraft has a cargo/transport mission (*C*) and is VTOL or STOL (*V*). The first letter indicates the primary capability. Helicopters and VTOL or STOL aircraft are given a second letter designation (*H* or *V*) to indicate type. Designation symbols to be used are: A—attack, B—bomber, C—cargo/transport, E—special electronic installation, F—fighter, H—helicopter, K—tanker, O—observation, P—Patrol, S—antisubmarine, T—trainer, U—utility, V—VTOL or STOL, X—research, Z—airship.

In event an aircraft is modified, another symbol could precede both the basic mission and type symbols and the status prefix symbol. Modified mission symbols to be used are: A—attack, C—cargo/transport, D—director, E—special electronic installation, H—search/rescue, K—tanker, L—cold weather, M—missile carrier, Q—drone, R—reconnaissance, S—antisubmarine, T—trainer, U—utility, V—staff, W—weather. Thus, if our YCV-2ADH Caribou were modified to include the capability of a tanker, its designation could be changed to KYCV-2ADH.

The *2A* in our designation is the design number and series symbol. The letters *I* and *O* will not be used as series symbols since they are easily confused with the numerals *1* and *0*.

The *DH* is the two-letter manufacturer's or source code which completes the designation. Changes in the old series of symbols include the addition of *BC* for the Bell Aerosystems Co. Also, the Piper Aircraft Corporation and the Piasecki Aircraft Corporation symbols have been switched, making Piper *PA* and Piasecki *PI*.

Nicknames, such as Mohawk, Otter, and Caribou, will be assigned only to aircraft in production or those about to go into production. The names will be one word and fit the characteristics of the aircraft.

The Air Force is charged with the overall administration of the switch to the new designations. Each service has been assigned a single point of contact for administration of designation assignments within its scope. For the Army it is the Army Materiel Command.

CIVIL AIRCRAFT

The present system of marking civil aircraft in the United States is not affected. This system is the result of a Versailles agreement of 1919. In that year, a standard system of marking international civil aircraft was adopted. The system consisted of five letters. The first letter identified the country that the aircraft came from—D for Germany, N for United States, G for Great Britain, I for Italy, F for France, etc. The remaining letters were to identify the particular aircraft.

Aircraft marked in accordance to the Versailles agreement were literally covered with letters. The letters were painted as large as possible on upper and lower surfaces of each wing and on each side of the fuselage; the national letter was painted on each side of the vertical tail and on the top and bottom of each side of the horizontal tail.

In using this system, countries like Great Britain had a problem of identifying aircraft from the colonies. Some solved the problem by placing a letter or letters after their national symbol to identify the colony. An example of this can be found in Canada. At that time, Canadian aircraft carried the Great Britain prefix G followed by the two letters *CA* for Canada. Gradually some of these colonies began to break away from the mother country and desired national letters of their own. So the five-letter system of marking was modified in 1929.

Under the new system, many countries were given two national letters. Canada, for instance, was given the letters *CF*. Other countries like Brazil, *PP* or *PT;* Burma, *XY* or *XZ;* and Mexico, *XA, XB* or *XC,* received two- or three-prefix combinations.

Essentially, this is the way the situation remains today. At our great international airports like Idlewild, O'Hara, and Atlanta Municipal can be found aircraft markings from all over the world: CF-LAN (Canada), G-APFE (Great Britain), F-BGNK (France), D-ABOD (East Germany), OH-KRH (Finland), etc.

The international civil aviation markings presently in use are listed below. Note that Israel and Libya use 4X and 5A on their aircraft.

The method of displaying the identifications has changed, but not as abruptly as the identifying system. Gradually the size of the letters has been reduced. National letters on the tail of the aircraft have been dropped altogether. The letters on the wings have been reduced in size and are now shown only once on the top and bottom. And if they are found on the fuselage they will not be on the tail, and vice versa.

At first the United States did not adopt all the provisions of the international agreement. In the early days of flying, the only aircraft in the United States showing numbers were those used in racing, but even this numbering system was haphazard.

Numbers were painted on the aircraft to identify them in the race and were changed from race to race. But gradually it dawned on the barnstorming pilots (they spent much of their time going from place to place racing the then new and novel aircraft) that it was considerable trouble to remove the paint after each race. So each aircraft gradually assumed a number of its own.

Today racing numbers on aircraft in the United States have been standardized.

In January 1927 the United States officially started a system of registering and licensing all aircraft. U. S. aircraft were to bear the international *N* as agreed upon eight years earlier. After the N would be a second letter identifying the status of the aircraft—X for experimental, R for restricted, and C for commercial.

After the letters would be the registration number of the individual aircraft. Aircraft that were only registered but not licensed and those that were not allowed to leave the country for various reasons did not carry the national letter. In 1930 all aircraft were required to be licensed and all bore the N.

From that time until today there has been a steady change in the numbering system of U. S. civil aircraft. For instance, the status letters have been dropped and the words "experimental," "restricted," etc. have been placed on the fuselage. For a while we had three digit numbers with a prefix letter. As more and more aircraft were produced, we adopted a system of five digit numbers with a prefix. Now the FAA allows the use of two prefix letters.

Today the identifying markings may be displayed in two ways. One FAA regulation says that the letters should be affixed on the upper side of the right-hand wing and the lower side of the left-hand wing and on

both sides of the vertical tail. Another regulation allows the identifying number to be placed in large letters on both sides of the fuselage or on the vertical tail fin. If this method is used, no other markings are necessary.

Why the FAA allows two methods of marking aircraft is an interesting story in itself. It started with the adoption of Air Defense Identification Zones (ADIZ) during the Korean War. Jet fighters were sent up to identify all unknowns. Some aviators thought that letters placed on the fuselage would be seen more readily. But others were worried about the Army's antiaircraft systems and wanted the identification on the wings. So the change was left to the discretion of the owner.

MILITARY AIRCRAFT

The early systems of numbering military aircraft in the United States were very simple. Both the Army and the Navy numbered their aircraft in order of procurement. These numbers were placed in block figures on each side of the fuselage. The Army first marked its airplanes and lighter-than-air machines with an SC for Signal Corps, later AS for Air Service, and still later AC for Air Corps. The Navy was also interested in lighter-than-air machines and employed a suffix to identify the type—A for airplane, Z for balloon, etc.

The Army's numbering system was changed when it got too large to be practical. In this system the first two numbers indicated the fiscal year in which the aircraft was purchased. The remaining numbers were assigned during the fiscal year the aircraft was ordered. This numbering system went into effect during fiscal year 1922. Thus, the first Army aircraft purchased under the system received the number 22-1.

Shortly after Pearl Harbor, the Army adopted the system of using only the last number of the year the aircraft was purchased. Thus if an aircraft was the 325th bought in 1942, the number would have been 2325.

At that time no conflict was anticipated between aircraft bought in 1942 with those bought in 1952. Aircraft were not expected to last that long. However, some of the aircraft bought by the Army after the war lasted through the 10-year period. Aircraft such as the L-19 (now 0-1) caused a bit of a marking problem. Sometimes it was possible to solve this dilemma by prefixing the letter *O* (obsolete) to the identifying number.

When aircraft started using radio as a standard means of communication, another awkward situation appeared. It was desirable that four digits be in the call numbers and that they be the same as the number of the aircraft. But low-numbered aircraft, such as the first one purchased in 1943, could presumably have the number of 31. This was solved by building the low number up to 3001. Now five digits are used.

Previously, the Services have all used their own systems to designate aircraft. To eliminate mounting confusion, the new identification system has been put into effect. Designations of U. S. Army and international markings are given below.

NEW ARMY MARKINGS

Former Designation	New Designation
HELICOPTER SERIES	
HU-1, (A,B,D)	UH-1, (A,B,D)
HO-4	OH-4A
HO-5	OH-5A
HO-6	OH-6A
H-13E, (G,H,K)	OH-13E, (G,H,K)
H-19C, (D)	UH-19C, (D)
H-21B, (C)	CH-21B, (C)
H-23B, (C,D,F)	OH-23B, (C,D,F)
H-34A, (C)	CH-34A, (C)
H-37A, (B)	CH-37A, (B)
YH-41	NH-41A
HC-1A	CH-46C
HC-1B	CH-47A
VTOL & STOL SERIES	
AO-1A, (B,C)	OV-1A, (B,C)
AC-1, (A)	CV-2A, (B)
NONE	XV-3A
VZ-10	XV-4A
VZ-11	XV-5A
VZ-12	XV-6A
AC-2	CV-7A
OBSERVATION SERIES	
L-19A, (E)	O-1A, (E)
TL-19D	TO-1D
UTILITY SERIES	
U-1A	U-1A
L-20A	U-6A
L-23D, (E,F)	U-8D, (E,F)
RL-23D	RU-8D
L-26B, (C)	U-9B, (C)
RL-26D	RU-9D

INTERNATIONAL CIVIL AVIATION—ORGANIZATION MARKINGS FOR CIVIL AIRCRAFT

AN	Nicaragua	CB	Bolivia	CF	Canada
AP	Pakistan	CC	Chile	CR & CS	Portugal and colonies
B	Formosa	CCCP	Soviet Union (USSR)	CU	Cuba

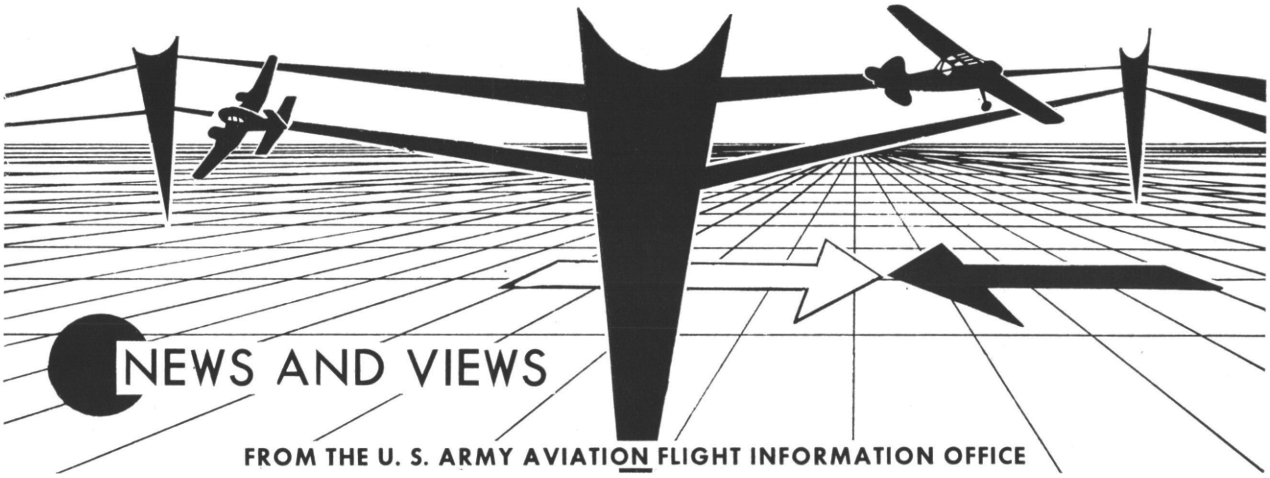
CX	Uruguay
CZ	Principality of Monaco
D	Western Germany
EC	Spain
EI & EJ	Ireland
EL	Liberia
EP	Iran
ET	Ethiopia
F	France & French Union
G	United Kingdom
JY	Jordan
JZ	Netherlands New Guinea
LN	Norway
LV	Argentine Republic
LX	Luxembourg
LZ	Bulgaria
MC	Monte Carlo
N	United States of America
OB	Peru
OD	Lebanon
OE	Austria
OH	Finland
OK	Czechoslovakia
OO	Belgium
OY	Denmark
PH	Netherlands
PI	Philippine Republic
PJ	Curacao (Netherlands Antilles)
PK	Indonesia
HA	Hungary
HB	Switzerland
HC	Ecuador
HH	Haiti
HI	Dominican Republic
HK	Colombia
HL	Korea
HS	Thailand
HZ	Saudi Arabia
I	Italy
JA	Japan
TG	Guatemala
TI	Costa Rica
VH	Australia
VP, VQ, & VR	British Colonies and Protectorates
VT	India
XA, XB, & XC	Mexico
XH	Honduras
XT	China (Nationalist)
XY & XZ	Burma
YA	Afghanistan
PP & PT	Brazil
PZ	Surina (Netherlands Guiana)
RX	Republic of Panama
SE	Sweden
SN	Sudan
SP	Poland
SU	Egypt
SX	Greece
TC	Turkey
TF	Iceland
YK	Syria
YR	Rumania
YS	El Salvador
YV	Venezuela
YU	Yugoslavia
ZA	Albania
ZK, ZL & ZM	New Zealand
ZP	Paraguay
XS, ZT & ZU	Union of South Africa
4R	Ceylon
YE	Yemen
YI	Iraq
4X	Israel
5A	Libya

USCONARC clarification of aircraft redesignation directives now requires implementation of new designations only in correspondence and publications. Old designations will be used on flight plans, in communications with FAA flight facilities and on aircraft and flight records until 14 Jan. 63.

A MECHANIC'S PRAYER

Sgt Jimmy O'Keef, Sgt Jesse Largent, Grover C. Tate, Jr.

Dear God, this is a prayer from men who work on the ground,
Asking Your help and that You stay always around.
If there is a loose bolt, give us sight to see;
Help us find trouble wherever it may be.
If there is a single thing in need of repair,
Arrange it, please, so we'll be sure to be there.
Let us find every bad bolt, bug, rivet or screw,
Before the ship leaves us, bound for the blue.
If something is to happen, no matter how slight,
Let it happen for us and not while in flight.
If the tach starts to go crazy and go round and around,
We pray let it happen while it is still on the ground.
If a tire wants to blow with an awful bang,
Let it do it for us, not the flying gang.
Make the ship strong and stable from nose to fin
And don't let a wrinkle mar her schoolgirl skin.
Make the prop keep spinning at a speed they desire;
Keep the ship free from all kinds of fire.
Like a Homesick Angel, make it climb in the sky,
Keep its engine heart beating and never say die.
Ground all the Gremlins, let them get in OUR hair,
But don't let them bother the boys in the air.
Let the wings never flutter, nor the engine stop,
Make it fly on and on and never drop.
We want our ships high-up close to You,
And with Your help, we'll get them there, too.
We stay on the ground and sweat blood and tears,
And hope and pray there's no reason for fears.
So please lend us a hand, give us power and sight
To do a good job and keep our ships right.
For it is in YOU we place our belief;
You won't let us down, You're our Commander-in-Chief.



New U.S. Army–FAA NOTAM Network

Effective 1 November 1962

DESPITE containing efforts to improve format and content of the U. S. Army Aviation Flight Information Digest, TB Sig 1 series (USAAFID), Army NOTAM needs aren't satisfactorily met, since it is a weekly publication. The requirement arose to form or join a system for the rapid collection and dissemination of aeronautical information.

From October 1961 until May 1962 Army airfields with USAF Weather detachments participated in the U. S. Air Force/Navy NOTAM collection and dissemination network. This network, operated by the Central NOTAM Facility, Tinker AFB, Okla., is now unable to accept Army NOTAMs due to their requirements for increased circuit time. Only Campbell AAF and Lawson AAF are retained due to their heavy volume of USAF traffic.

Redevelopment of an Army/Air Force/Navy system was considered, but found impractical due to the extreme differences in concept of operation between these services. The Army would have been required to conform to the procedures established by the USAF. These procedures are designed to satisfy Air Force/Navy requirements for: rapid transmission between all stations, coast to coast, of NOTAMs concerning selected airfields; and a NOTAM coverage suited to high-speed, long-range aircraft.

Army establishment of an Army / Navy / Air Force / FAA network was considered; however, costly duplication of facilities would have resulted, since future plans are for the FAA to assume complete responsibility for the entire NOTAM network.

The new Army/FAA system, effective 1 November, is the result of continuous efforts to improve Army NOTAM needs. It is one of least expense for Army participation and is best suited to Army Aviation with its complete Army-civil NOTAM coverage on an area basis. This system uses the existing FAA/Weather Bureau weather and NOTAM collection and dissemination system (Service A) which is the primary means of distributing NOTAMs. At present 36 Army airfields are included in the Service A network.

In addition to weather sequences and civil NOTAMs currently received on Service A, Army airfields and flight activities having Service A "receive-only" drops will receive Army NOTAMs. Other Army activities may request NOTAM information from the associated FAA Flight Service Station (FSS) by telephone or interphone for individual flights as needed. FSS cannot fulfill a fixed requirement on a routine basis. Each designated FSS tie-in station is listed in the Directory of Army Airfields, USAAFID.

Reports of NOTAM information may be made by pilots or others detecting irregularities; however, installation commanders (or designated representatives) will continue to be responsible for reporting of uncoded Army NOTAM material to the associated FSS by interphone or telephone. The FSS specialist, after having determined the acceptability of the material offered for a NOTAM in accordance with the FAA Manual ATP 7300.1 (formerly ATS-2-B) will encode the NOTAM for Service A transmission. The information may not be revised so that the originator's meaning is destroyed or altered.

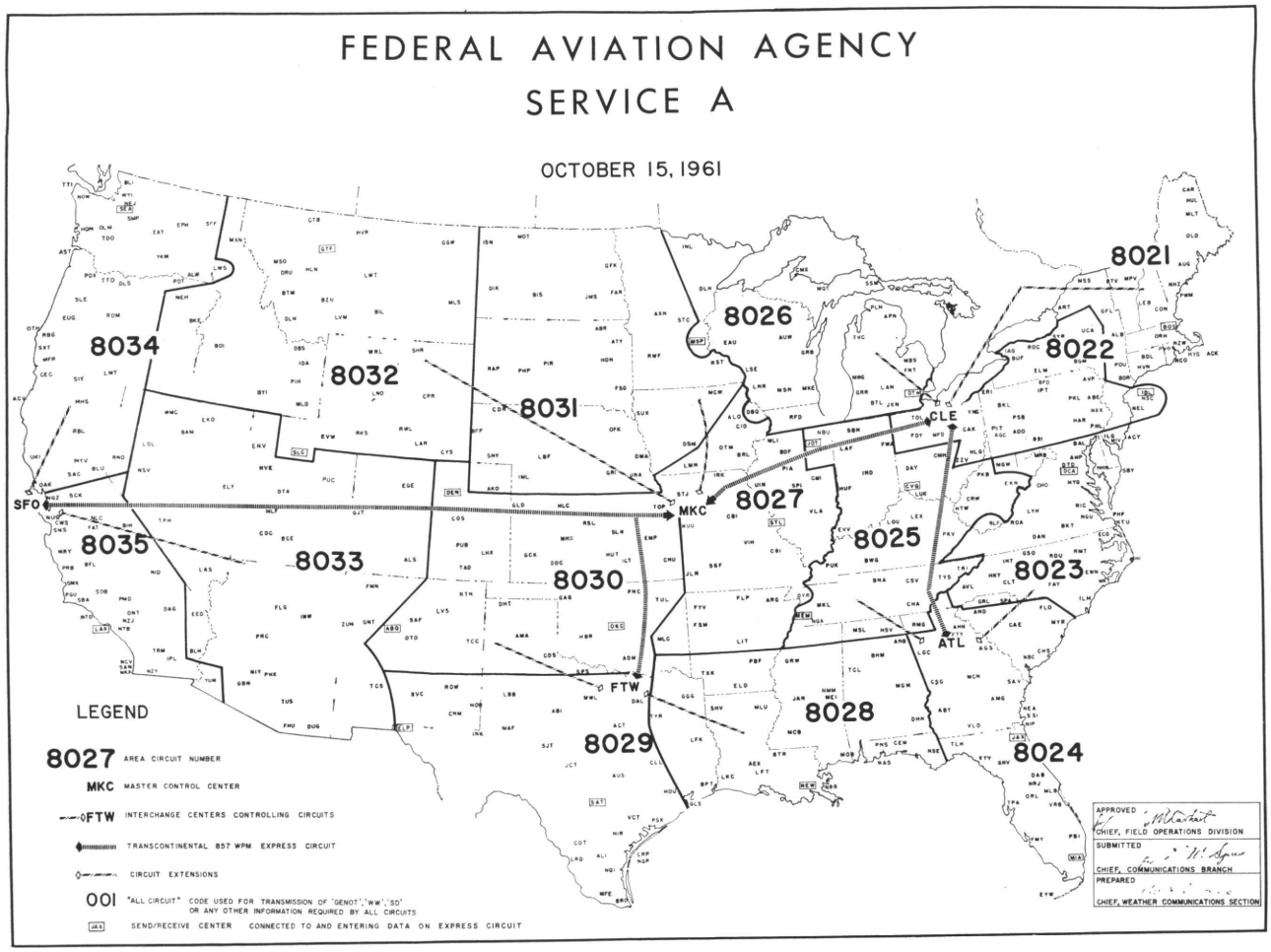
NOTAMs regarding hazards to flight should be specific and briefly outline the nature of the activity, area, altitude, times, and cite the number and type of aircraft involved. Most important, they should be pertinent to the safety of flight. The NOTAM transmitted to correct a previous NOTAM should not be identified as a correction.

Dimensional units or values shall be distances in nautical miles (except for visibility and airway width values), fractions in tenths, horizontal speeds in knots, and vertical speeds in feet per minute. Time is to be expressed in Greenwich (Zulu) time.

Essential information on the operational status of navigational aids operated by the FAA, independent radio aids and military aids, is given appropriate NOTAM dissemination. It is important that deviation from normal operation or failure of navigational aids be promptly publicized by NOTAM. The unreliable condition of VOR radials shall be described clockwise in degrees outbound from the transmitter. Different aids installed at the same location are to be treated as separate facilities, e.g., NDB and VOR. Any NOTAM on a particular aid or hazard shall cancel or supplement all previous NOTAMs on that aid or hazard. Temporary interruptions or maintenance shutdowns of aids operating on a test or training basis will not be publicized by NOTAM. If a commissioned facility is "Ground checked only; awaiting flight check," initiate a request for NOTAM publication.

NOTAMs on shutdowns for scheduled routine maintenance shall be transmitted on Service A five hours in advance and for nonscheduled preventive maintenance, when possible, one hour before shutdown.

Positive advice including time



of return must be publicized by NOTAM, stating that a navaid has returned to normal status after completion of maintenance.

Information concerning a new radio aid is available in advance of commissioning and should be forwarded by mail to the U. S. Army Aviation Flight Information Office. However, the forwarding of information concerning a new facility operating on a test or training basis is not mandatory. In either event details about a new facility should include:

- Location name
- Type of facility
- Frequency
- Identifier
- Geographical coordinates
- Monitoring category
- Controlling facility
- Facility to field, magnetic bearing, and distance in nautical miles
- Service volume designator
- Class and other pertinent remarks

NOTAMs concerning radar facilities shall be issued only if a change in the equipment characteristics persists which may adversely affect its use or is expected to persist for more than 30 minutes.

Use of the ASR function of Army GCA systems may be continued when a failure peculiar to the PAR function occurs. Failure of either the azimuth or elevation portion of the PAR function results in the entire PAR system being considered inoperative. The appropriate information shall be reported, in either case, to the FSS.

Any change concerning the status of obstruction lights when such change may affect the safety of aircraft operations shall be reported by NOTAM.

A notice of proposed construction or alteration of any structure higher than 150 feet above the surface which may adversely affect air operations is NOTAM information. The location shall be described in feet or miles and in 16 points of the compass from the nearest airport shown on current aeronautical charts.

Each message reporting the closing of an airfield or a runway or portion thereof should state briefly the reason and expected duration. No reference is made to a reopened runway unless a permanent change in it has been made, such as lengthening, shortening or hardsurfacing. Runways shall be identified by the magnetic bearing indicators, e.g., 10-28, or where magnetic bearing indicators have not been established, by the general direction of the runway, e.g., E-W.

The subject matter of a NOTAM may warrant USAAFID publication rather than Service A transmission. A change from advertised time of any pending facility change or other action which has been published in the USAAFID shall be made the subject of a NOTAM. The USAAFID goes to press every Tuesday and will contain NOTAM information received at the U. S. Army Aviation Flight Information Office up until 1200 E on Monday.

USAAFID communications should always enumerate all hazardous conditions and facility data changes not reported previously which are expected to exist when the next USAAFID goes to press. The source, locale, and expected duration of conditions should be indicated.

When a temporary abnormal condition no longer exists, the item will be dropped from the USAAFID.

A mail item advising that an action will take place "on or about" a certain date will be carried in that form until a confirming actual date is received.

The following temporary conditions are not publishable in the USAAFID:

- Outages of rotating light beacons
- Mowing
- Snow, unless considered hazardous
- Tower light outages
- Tetrahedrons
- Advisory references to wind tees

Army recommendations for early improvements in this system are the elimination of the NOTAM code and the addition of a summary of Air Force/Navy NOTAMs. It is anticipated that NOTAMs warranting USAAFID publication which cannot be mailed to meet the USAAFID publication deadline will be phoned in for Service A transmission.

Refer any problems encountered in the use of this system to the U. S. Army Aviation Flight Information Office.

The continental U. S. is divided into 15 circuit areas. The minimum distribution of a NOTAM is at least three circuit areas. Many overlapping distribution patterns cover the entire United States. Each transmitting station has its own distribution pattern, based upon the importance of the weather (by location) being transmitted. The Army NOTAM is given the same distribution as an FAA NOTAM originating at the tie-in station.

Local dissemination is considered to embrace the local area served by the issuing FSS. All NOTAMs shall be given local dissemination. See guide below for distant dissemination. An X in the USAAFID column indicates that the NOTAM should be sent to USAAFIO for publication in the USAAFID.

TYPE OF NOTAM	Distant Dissemination				
	1 time		Repeated		
	Service A	Bcst	Service A	Bcst	USAAFID
RADIO AIDS					
A. Permanent establishment, withdrawal of radio aids, or change in power (50 percent or more).	x	x			x
B. Change in frequency, identification, location name, range course(s) alignment, range quadrant (reversal), unusable radials, or "ground check awaiting flight check" status.*	x		x	x	
C. Interruption or return to operation of radio navigation aids, including maintenance shutdowns. (Latter broadcast locally and by adjacent broadcast facilities only.)			x	x	x
D. Interruption or return to operation of voice communication channels including maintenance shutdowns.			x	x	x
E. Change of primary tower frequency.	x		x	x	
F. Interruptions or return to operation of any radar or DF equipment.	x	x			
* Broadcasted upon receipt of notification and continued for 12 hours on each scheduled broadcast.					
LIGHTING FACILITIES					
A. Permanent establishment, withdrawal, or changes to airfield lighting facilities.	x	x			
B. Interruption of or return to operation of:					x
1. Approach light systems, runway or taxiway lights,* airway beacons, or (a) hazardous structure marking lights within 5 miles of an airfield; or (b) "top level" hazardous structure marking lights (radio and TV towers, tall buildings, etc.) outage on structures which are more than 300 but not more than 500 feet in height AGL and 5 miles or more from a lighted airfield; or (c) any hazardous structure marking lights at 500-foot level or above on structures more than 500 feet in height AGL and regardless of structure location with respect to airway or airfield. NOTAM sunset to sunrise only.			x	x	x
2. Airport beacon; during IFR weather and sunset to sunrise.			x	x	
*NOTAM required only when all or a substantial portion of the lights marking a runway or taxiway are inoperative.					
DANGERS TO AIRCRAFT					
A. Permanent establishment, withdrawal, or change to airport.	x	x			x
B. Any temporary airport condition which precludes landings at a specified location. (Airport closed due to snow, flood, night operations or to specific aircraft.)			x	x	
C. Instrument runway(s) and/or longest runway closed or partially unusable.			x	x	x
D. Occurrence or correction of defects in the movement area:					
1. Of airports where continuous airfield traffic control or airfield operations advisory service available.	N	O	N	E	x
2. Or temporary minor obstructions on or near the airport which do not preclude aircraft operation, such as "grass cutting in progress," at airfield not having airfield traffic control or airfield operations advisory service.	x				
E. Aircraft accidents.	x			x	
F. Presence of balloons.	x	x			
G. Mass movements of aircraft or military maneuvers which might affect air navigation.*	x	x			
H. Changes in procedures for air traffic control; air navigation or instrument approaches; status of search and rescue (SAR) services; entry regulations requiring immediate action.*	x	x		x	
* This information, when suitably condensed, is acceptable for distribution of NOTAM form only when the pending changes directly affect aircraft operations and circumstances necessitate implementation of the changes without giving the required advance notice in the USAAFID.					

Judgment and Ducks

Captain Howard R. Foster

STEALING HOME after a late poker session, George doused his car lights, switched off the engine and coasted silently and darkly into his drive. That's DISCRETION.

He removed his shoes on the porch, inserted his key in the well soaped lock and opened the door on hinges that had been oiled that same afternoon. That's PLANNING.

Without faltering, he walked through the living room to the hall and up the stairway, counting his steps as he went. After exactly 53 steps, he stopped, turned and crept silently into the bedroom. He stripped off his clothes and folded them over a chair. His hands found the right drawer in the dresser, opened it and brought out his pajamas. That's KNOWLEDGE, PRACTICE, AND EXPERIENCE.

George donned the pajamas, carefully folded the covers back on his bed and lay down. As his head touched the pillow, the bedside lamp came on and his wife sat up.

"George, what time is it?"

He grabbed the clock from the table between them and pretended to stare sleepily at it while he wound the hands from 3 a.m. back to 11:30 p.m. Yawning widely, he held the clock out for her to read. That's THINKING.

Whether he knew it or not, George was demonstrating some pretty fair judgment. But if you asked him to define good judgment, chances are he'd stammer around considerably and still come up with an unsatisfactory answer. I know, because I've been trying to describe it in simple terms for several weeks. Believe me, it isn't easy!

We've all heard gray haired Army Aviators tell how they learn something new each flight. Certainly, knowledge and experience are necessary parts of good judgment. But a very wise man once said, "Knowledge and experience are what you think you have until you get more of them."

The January issue of the ARMY AVIATION DIGEST carried an article entitled "Knowledge is the Key to Success." It was an excellent article, but I believe a better title would have been "Knowledge is *A* Key to Success," and this should be further qualified to require that what knowledge we have be put to use. Any key gets rusty if we hang it on a nail and leave the door locked.

Take Henry, for example. He was at the same poker session with George, but he no sooner cracked the front door than he was faced with an angry wife. Though he had been married 10 years to George's 3, Henry failed to put his knowledge and experience to use.

Another example with far more serious consequences involved a Senior Army Aviator with 17 years experience and 4,741 flying hours. Despite this aviator's background of experience and knowledge, he attempted a flight in the face of a severe weather advisory calling for thunderstorm activity and moderate to heavy icing from the ground up along his route. The aircraft disappeared and has never been found.

Capt Foster is Assistant G-1 for Personnel Management, Ft Rucker, Ala. He is fixed wing and multiengine rated with over 1500 flight hours.

Ignoring a severe weather advisory predicting thunderstorms en route shows poor judgment, too much reliance on experience

Still another more recent incident happened when two Army Aviators were making a VFR flight from point A to point B. Frontal activity was reported passing through the B area at the expected time of departure from A, so the aviators filed to C, expecting to file on to B from the air if the frontal activity was reported past B when they arrived at C. When they arrived at C, B was reporting an 8,000-foot overcast, 2 miles visibility, rain showers and haze. Approaching B, they found the actual weather to be 800 feet overcast and 2 miles visibility. They requested and received a GCA from B. The landing was completed without incident. However, some embarrassing questions were asked about VFR flying in an area with an 800-foot ceiling and the need for a GCA approach.

These examples prove to my mind that knowledge and experience are not the complete answer. What is it?

Perhaps one way to learn about good judgment is to discuss what it isn't. Certainly good judgment does not include . . .

OVERCONFIDENCE

This bugaboo has been the subject of many accident studies. Records seem to substantiate the premise that the 200-500 hour level of flying experience is the most dangerous for us all. From the time we win our wings until we build up enough experience to find out how little we really know, most of us would try flying a barn door if we could find a way to propel it.

A good picture of this type was the young Army Aviator who reported to his first unit, bringing a wife and two children, but no personal insurance. Asked what coverage he had, he bragged to his associates that insurance was for the birds.

The last of this aviator's career was written during a night flight a few months later. His wife now faces an almost impossible struggle to keep her small family together while working to support them. Overconfidence — so great that this aviator was willing to risk his family's future on his limited ability.

COMPLACENCY

Closely akin to overconfidence and often resulting from it, complacency affects us all to some degree. It's a very human trait with symptoms we often recognize in others, but just as often fail to acknowledge in our own makeup. Two of these symptoms are inadequate planning and failure to keep informed. Ever caught yourself at the end of the runway wishing you'd spent a few more minutes planning your flight?

Thousands of words have been written about how hard it is to keep informed on the dual fields of branch qualifications and flying. Granted, it isn't easy. But it's a fact of life in Army Aviation — one we'll have to live with, and it can be done.

The Army Aviator who had a series of incidents followed by a minor accident, all due to poor judgment, wouldn't admit to complacency. According to him, it was just bad luck that he happened to be in the wrong place at the wrong time. He spent a great deal of time explaining this to his associates. If he had spent this time trying to find a way to correct his judgment, he might have avoided the final major accident that cost him his life.

FEAR

Fear, like complacency, is a trait few of us willingly admit. There may be aviators who have never been afraid while flying. If so, they have a far more serious problem than the rest of us because, according to the psychologists, they aren't human.

Unlike complacency, fear is a desirable trait up to a certain

point. Here are some quotes from the May 1961 issue of APPROACH, The Naval Aviation Safety Review, that help to tell why:

" 'It is particularly true that situations that are filled with intense personal danger are invariably accompanied by fear,' the authors of "Survival in Water" write. 'Fear is the body's way of providing an emergency response to an unusual or unexpected stress. It stimulates the individual physically and mentally for the purpose of better preparing him to cope successfully with the danger that confronts him. However, depending on the makeup of the individual, his early background, training, and experience, and the training he has had in the job he is doing, he is able to accept the fear and all of the discomforts which go with it or he is panic-stricken by anxiety and is rendered ineffective.

" 'Familiarity, experience, and training act as buffers and protect the individual from a disorganizing psychological response. . . . A trained and seasoned man has greater flexibility and is able to bend with the stress, so to speak, without breaking. Conversely, unfamiliarity, inexperience, and a poor quality of training or too little training are major causes of abnormal mental and emotional reactions.'

"As one Navy flight surgeon told his pilots some time back, 'The only way you will be able to survive an emergency is to have a tailor-made reaction for the situation pre-wired and planted in the dusty recesses of your skull, ready to transmit as soon as the button is pushed. If you don't have one, that button will activate another standby circuit which is very effective indeed. The name of the other circuit is PANIC.' "

DESTINATION FEVER

We've all heard and read about aviators who were so anxious to get somewhere that they left all signs of good judgment at the airfield gate. The highly experienced Army Aviator mentioned earlier was one of these; he was in a hurry to get home for Christmas.

I heard of another aviator who took off in zero conditions and flew between two mountains that were higher than the altitude capability of his aircraft. Through a miracle he made it. Where was he going? To see his girl friend.

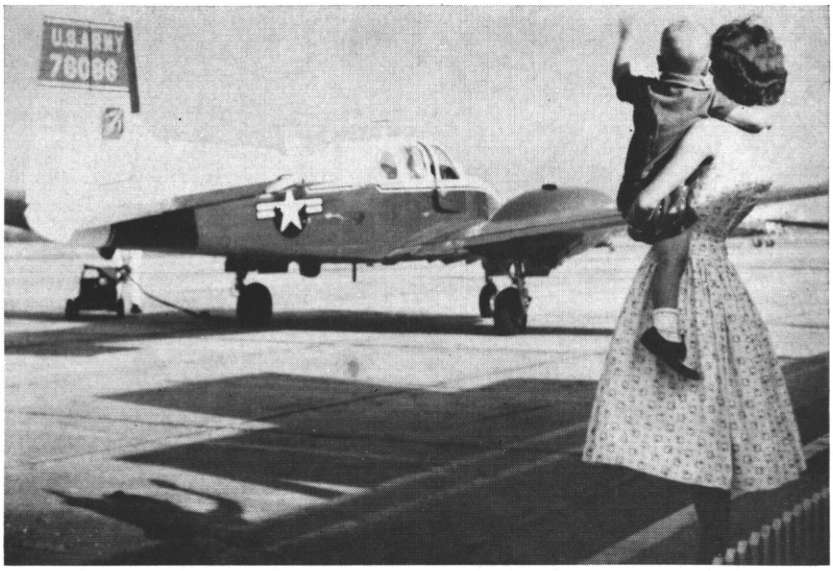
DOMESTIC PROBLEMS

Married men who never have domestic problems are in the same category with aviators who never experience fear: they're both freaks of nature. And please don't skip over this section just because you're single. A spat with your girl friend can be just as troublesome. The only difference is that you don't have to gnaw your way through burnt toast the following morning.

Though it's usually hard to get accurate information on what part domestic problems played in causing accidents, cases are on record in which it was proved beyond all doubt. And this is an area the medical member of an investigation board is called on to probe thoroughly.

The difference between an Army Aviator who shows good judgment in the face of domestic problems and one who doesn't is easily recognized. The first leaves his problems at home while the other carries his to work. This wouldn't be so bad if he'd include them in his preflight and shake them off with the pitot cover. The trouble comes when he takes them into the cockpit and attempts to divide his attention between his problems and flying. Most of us aren't blessed with the multiple

Trained, seasoned men are able to withstand stress without breaking and overcome panic and fear in unfamiliar situations



Leaving domestic problems at home, or better still, having a congenial household is conducive to "old pro-ism" in the cockpit

track minds required to handle both.

These are a few of the problems which hinder good judgment. There are many others — job pressure, overanxious desire for recognition, fatigue, ad infinitum. Like Air Force Major General Joseph D. "Smokey" Caldara said: "Our accidents rarely result from some great, dramatic catastrophe, but from a series of piddling coincidences that snowball to disastrous proportions. It's a case of getting nibbled to death by ducks. You're not being bitten in half by an alligator and you've got to think in those terms. Take the time to kick the ducks away."

George knew how to kick the ducks away. How about you?

OV-1 Trainer Cuts Ground School Time

Shown here in operation is the Mohawk Cockpit Procedure Trainer, installed at the U. S. Army Aviation School, Fort Rucker, Alabama. Used primarily to familiarize aviators with cockpit procedures peculiar to the Mohawk, the trainer is credited with cutting ground time of the trainees from 15 to 20 minutes per day.

The device consists of a Mohawk cockpit and an instructor's station, located in the rear of the cockpit. The instructor's station contains malfunction and emergency switches, mounted on an instrument panel. It is used to show the proper procedures for correcting six selected emergencies. The cockpit is an exact replica of the Mohawk.

The instructor creates malfunctions or emergencies that can happen to Mohawk aircraft and leaves the corrections up to the aviator seated in the cockpit. Without ever leaving the ground an aviator can experience such emergencies as aircraft fires and engine failure, or malfunctions such as generator voltage drop and excessive propeller rpm. The trainer is the most economical means by which an aviator can learn to rectify existing aircraft failures or emergencies.

Built by the Sesco Manufacturers, Inc., Bridgeport, Penn., the trainer is known as Device 20-9.

Forced Landing? It Doesn't Always Happen to

the other fellow!

Captain Arthur E. Heinmiller

TODAY PERHAPS the most underemphasized phase of flying is proficiency in forced landings. While going through flight school, or a checkout in a new type of aircraft, the simulated forced landing becomes almost second nature, but this proficiency is short lived upon completion of the training. During future flights, almost all maneuvers are performed except simulated forced landings.

Perhaps two things have contributed to this complacency about forced landings. First, too many aviators may feel that an actual forced landing will happen to the other guy; second, our aircraft and mechanics are better than ever, resulting in fewer actual forced landings.

Despite our many technical improvements in aircraft and improved maintenance practices, I know several aviators who have made forced landings of one sort or another recently — one poor aviator having three in one day, so let's review a few points that may be of benefit.

Preparation for a forced landing starts in the planning room, just like the rest of a flight. Altitude and route selection can be of utmost importance if the chips are down. Avoid hazardous terrain and large bodies of water if at all possible. If these cannot be avoided, select an altitude which will allow sufficient time for pilot, crew, and passengers to safely bail out.

If you carry passengers, make sure they know how to use the parachute they wear. Tell them what to expect and what to do if a forced landing or a jump has to be made. This will not frighten your passengers; rather it will increase their confidence, because here is an aviator who knows what he is doing and cares for other's safety as well as his own.

If a flight is to be made over isolated areas, proper survival gear could make the difference while waiting for help to arrive. Survival gear may be an issue survival kit or shoe box packed with the things you might need. The important thing is that you possess the basic elements necessary to survival in the terrain over which you operate. A knife of some sort is basic for flights over any type of terrain. Even a common jackknife is invaluable to cut yourself free of hopelessly tangled shroud lines in a tree.

Time and time again we've heard about making a thorough preflight, and if flying over bad terrain or water, a little extra effort would not hurt. Radio gear is normally double checked when taking off on an actual instrument flight, so why not do the same on *all* flights? Good radio and navigation aids could assist rescuers in speeding help on its way to your exact position.

Once airborne, the element of time is against you. You don't have time to figure things out over a cup of coffee; keeping calm and making instant, correct decisions will now make the difference whether the forced landing is satisfactory or not. Will I bail out, try to make it to X airport, land in that field, or on the highway? These may be your choices — and you had better make the right one.

At the first sign of trouble be sure to properly analyze the seriousness of your dilemma. While flying an 0-1 [L-19] one aviator, in checking his flight instruments, noticed that the oil temperature gauge needle had hit the far stop on the dial. All other gauges were reading normal. Although only 5 minutes from a large airport, the pilot immediately declared an emergency and landed in a field. Maintenance personnel found the oil temperature gauge to be defective. Proper analysis by the pilot would have told him this, because both the cylinder temperature and oil pressure gauges were reading normal. Although a potential emergency existed, it did not warrant landing in a nearby field and possibly damaging an aircraft when the aircraft could have flown indefinitely with a malfunctioning oil temperature gauge.

If your engine is losing power or stops completely, remember to use the restart procedures you were taught. Let's hope with periodic reviews you'll remember what to do. One important

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Capt Heinmiller is attending the University of Southern California Safety Course prior to an overseas assignment.

fact: the items simulated during practiced forced landings are now for real!

A student aviator coming back from a stagefield ran out of gas on entry leg to RW 36. Immediately he started his cockpit check, gas on fullest tank, mixture full rich, etc., and landed deadstick on RW 18 with one tank reading ¾ full. During training, fuel switching is *simulated* for safety reasons, and this is exactly what the student had done — SIMULATED switching tanks! Remember that the majority of engine failures are due to fuel starvation. That is why the first thing to be done in most restart procedures is to switch fuel tanks.

Knowing your aircraft and its capabilities, as well as your own, is instrumental if a safe forced landing is to be executed; and this only comes through practice. One day while talking shop to an aviator with over 3,000 hours, I mentioned the fact that an 0-1A [L-19A] or E model could execute a 360° overhead, power-off landing, into a 1,600 foot strip with only 500 feet of actual altitude in our particular area. He said it was impossible but was soon convinced after a demonstration and making three successful approaches himself. This in no way means this method should be used normally, because unless 10° - 15° of flaps are lowered and the turn started immediately, the approach will not work. Nor will it necessarily work with other aircraft. A little practice and experience, coupled with knowledge of what your aircraft can do, can help immeasurably during an actual forced landing.

Every time we land an aircraft, we unconsciously plan our pattern and make the resultant landing. In the event of partial or complete engine failure, the only difference is that planning and judgment are more critical. One way to allow for error in judgment is to plan your touchdown in the middle third of the selected field, with medium flaps down. If you are a little lower than anticipated, you could land at the beginning of the field; to prevent overshooting, more flaps can be added.

As far as field selection goes, common sense is the rule here. Just remember, if your planning is not going to work for your initial selection, change the pattern or land in an alternate while there is still time. Don't try to stretch that glide or violently slip the aircraft with full flaps down, or you're asking for more trouble than you already have. Remember, a controlled landing in the trees may be better than an uncontrolled landing on a 10,000-foot runway.

The most important part of any landing is naturally the touchdown, and this can be critical with no power under the tension of an actual forced landing. Don't do like one aviator did in an 0-1 [L-19]. He made a wheel landing in a field where the grass was chest deep. In a few feet the grass had bunched up around the gear and flipped the aircraft on its back. A three-point landing was the proper solution in this case. What type landings should the aircraft you fly make in rough, unimproved fields?

This article will in no way make the reader more proficient in forced landings, nor the procedures involved; but it is meant to stimulate a little thought on the subject. Due to the amount of student training and high utilization of aircraft at the Army Aviation School, forced landings happen with more frequency than in field units. Many aviation units throughout the world probably have not had a forced landing in years. The result? Complacency sets in. Let's hope that units with a fine record keep up the good work, but meantime, a little practice never hurts anyone. Remember! It doesn't always happen to the other guy!

When your route is over isolated areas, survival could be your concern, not the other fellow's

Heads

You Win!

PRAISE FOR THE protective helmet is almost as old as aviation itself.

In 1913 two Signal Corps pilots, Lieutenant Brereton and Lieutenant Chandler, crashed into the bay near Point Loma, Calif., in a flying boat.

Lieutenant Chandler was drowned and the airplane destroyed. The board of officers investigating the accident concluded: "Lieutenant Brereton probably owes his escape from serious injury in part at least to his helmet as (he) received serious blows on the head."

The helmet worn by Lieutenant Brereton would hardly resemble the APH-5 worn by Army Aviators today. In fact, the comparison would be about as close as comparing the fragile, slow-speed flying boat they were piloting to the modern Mohawk. The APH-5 has been developed to keep pace with the higher g forces of today's aircraft.

We are still hearing words of praise for the protective helmet from flight surgeons and personnel who have benefited from its use. Unfortunately, we will never hear from some who scorned its use, or failed to realize its value before it was too late.

Three Army Aviators, all involved in separate accidents in different types of helicopters, will gladly give testimonials to the APH-5's protective ability.

Take, for example, the UH-1A [HU-1A] pilot who experienced

Did the pilot's extra care prevent extreme injury?

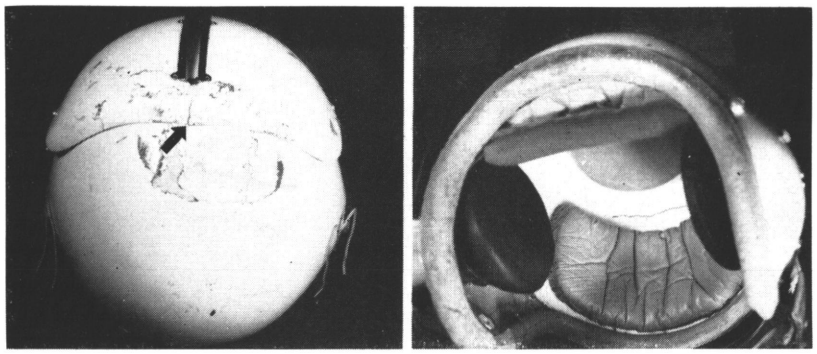
Prepared by the United States Army Board for Aviation Accident Research.

a flameout at low altitude over a densely wooded area. Upon impact the pilot, still strapped to his seat, was hurled forward through the front of the helicopter. His APH-5 helmet shattered the right corner post of the windshield during his 15-foot human "missile launch" into the woods.

"The pilot sustained minor head injuries and a broken arm," the flight surgeon reported, "but it was unanimously agreed upon by all investigators that the APH-5 helmet protected the pilot from probable fatal head injuries.

"The helmet functioned well except for the visor, which was in the 'down' position. It was broken and these broken edges were very sharp, almost razor-edged. They inficted a laceration over his right eye.

"The pilot wore flying gloves, chin strap and nape strap tight, shoulder straps adjusted, and seat belt quite tight," the flight surgeon said. "I feel that his extra care may well have prevented extreme injury. His helmet did not come off. Part of his left glove was torn off—instead of part of his hand."



Arrow (left) shows where helmet was cracked completely through. Complete transverse fracture of inner liner

In another accident involving a wire strike by an OH-13 [H-13], the APH-5 again proved its value.

The pilot was flying solo and performing observation duty at the same time. He became so absorbed in the activity on the ground that he allowed his attention to be distracted from his flight path. The OH-13 [H-13] struck several 1-inch diameter high tension wires and plummeted to the ground completely out of control. Officials calculated that the helicopter struck the ground at an estimated force of 30 g vertical and 6-10 g horizontal.

Upon contact the pilot was whipped violently forward, the top of his helmet striking the instrument panel. The force of the blow was so great that it caused a complete "transverse fracture of the white inner shock absorbent liner."

The flight surgeon was emphatic in his appraisal of the APH-5's crash-injury protection: "The APH-5 helmet most certainly prevented a fatal skull injury, in spite of its being lost immediately after initial impact."

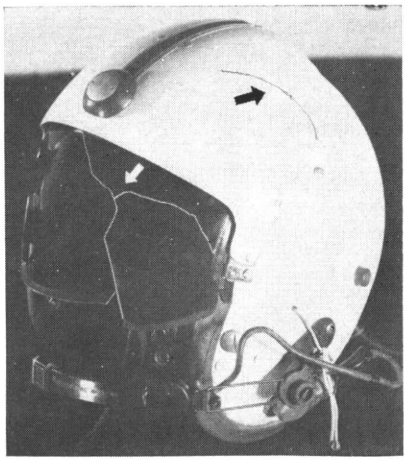
The pilot sustained several face lacerations when his head struck the console and shattered the Plexiglas during the roll following the initial impact. The flight surgeon pooh-poohed as a mistaken idea that a properly fastened chin strap would choke its user. He figured the lacerations would have been prevented or minimized if the pilot had fastened his strap.

Recently an OH-23B [H-23B] pilot has become a member of the "I-Like-the-APH-5 Club." He was flying a patrol mission over rugged desert terrain at approximately 300 feet and with a high density altitude. Following

This OH-13 accident looks unsurvivable — but the APH-5 helmet was credited with saving the pilot's life

engine vibration the pilot placed the aircraft in autorotation and crashed on uneven terrain. As the aircraft rolled over, the pilot's head was snapped forward against the instrument panel. The helmet visor was broken and the left side of the APH-5 took the brunt of what could have been a grave, if not fatal, head injury.

Crash injury analysts, manufacturers, flight surgeons, and others are at work striving to improve helmets from the standpoint of comfort, safety, and other areas, including the reduction of outside noise.



Black arrow shows where helmet snapped against OH-23 instrument panel. Note visor

One problem facing the experts in this field is that they don't accurately know what the human head can take in terms of impact. Figures are available on magnitude of forces, but very little is known on duration and rate of onset.

Until a sufficient number of volunteers step forward to help solve the problem, it might be wise for Army Aviators to adopt the slogan, "Wear the APH-5 and Stay Alive!"

Cat and Duck Method of Flight

TODAY'S flight age is an era highlighted with increasing emphasis on safety. Instrumentation in the cockpit and in the traffic control tower has reached new peaks of electronic perfection to assist the pilot during takeoffs, flight and landings.

For whimsical contrast to these and other marvels of scientific flight engineering, we revive the basic rules of The Cat and Duck Method of Flight.

(1) Place a live cat on the cockpit floor. Because a cat always remains upright, he or she can be used in lieu of a needle and ball. Merely watch to see which way the cat leans to determine if a wing is low and, if so, which one.

(2) The duck is used for the instrument approach and landing. Because any sensible duck will refuse to fly under instrument conditions, it is only necessary to hurl your duck out of the plane and follow her to the ground.

There are some limitations to the Cat and Duck Method, but by rigidly adhering to the following check list, a degree of success will be achieved.

1. Get a wide awake cat. Most cats do not want to stand up at all at any time. It may be necessary to get a large fierce dog in the cockpit to keep the cat at attention.

2. Make sure your cat is clean. Dirty cats will spend all their time washing. Trying to follow a washing cat usually results in a tight snap roll followed by an inverted spin (Flat). You can see this is very unsanitary.

3. Old cats are best. Young cats have nine lives, but an old used-up cat with only one left has just as much to lose as you do and will be more dependable.

4. Avoid stray cats. Try to get one with a good pedigree. Your veterinarian can help you locate a cat with good character, or try a good breeding farm.

5. Beware of cowardly ducks. If the duck discovers that you are using the cat to stay upright, she will refuse to leave without the cat. Ducks are no better on instruments than you are.

6. Be sure the duck has good eyesight. Nearsighted ducks sometimes fail to realize they are on the gauges and will go flogging off into the nearest hill. Very nearsighted ducks will not realize they have been thrown out and will descend to the ground in a sitting position. This maneuver is quite difficult to follow in an airplane.

7. Use land roving ducks. It is very discouraging to break out and find yourself on final for a rice paddy. Particularly if there are duck hunters around. Duck hunters suffer from temporary insanity when they are sitting in freezing weather in their blinds and will shoot at anything that flies.

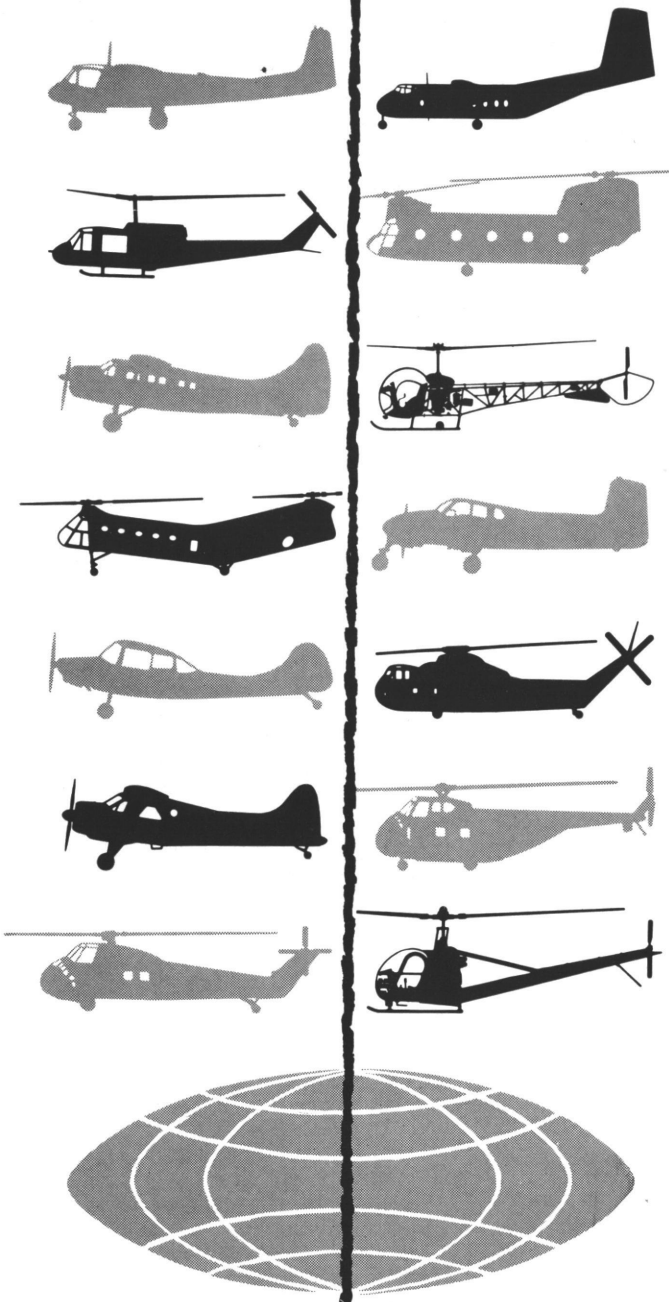
8. Choose your duck carefully. It is easy to confuse ducks with geese because many water birds look alike. While they are very competent instrument flyers, geese seldom want to go in the same direction you do. If your duck heads off for Canada or Mexico, you may be sure you have been given the goose.

The Air Line Pilot, February '62

prepared by
THE U. S. ARMY
BOARD FOR
AVIATION
ACCIDENT RESEARCH

TWX EXCERPTS

From Sept. and October



U-6A (L-20A) TAXIED into drainage ditch while parking. Incident damage to propeller.

UH-1A (HU-1A) OIL WARNING LIGHT came on in flight. Forced landing accomplished in rice field with no damage. Water in cannon plug caused electric short in warning system.

U-6A (L-20A) ENGINE RAN ROUGH while flying in heavy rain during actual instrument flight. Forced landing accomplished with no damage. Caused by wet magnetos.

UH-1 (HU-1) ENGINE FAILED in flight. Forced landing accomplished with no damage. Caused by ruptured fuel line.

OH-13G (H-13G) LOST RPM and crashed during downwind (gusting 10-20 knots) approach to pinnacle. Major damage to main rotor blades and aft cross tubes. No injuries.

U-1A (U-1A) EMITTED SMOKE and heat in cockpit shortly after takeoff. Forced landing accomplished with no damage. Caused by separation of exhaust manifold from engines.

CH-34C (H-34C) STRUCK TAIL ROTOR of parked helicopter while taxiing at night. Incident damage to two main rotor blade tip caps of taxiing aircraft.

OH-13E (H-13E) ENGINE partially failed in flight. Aircraft was autorotated to broken and rocky terrain, slid off landing area, and sustained major damage to all components. No injuries.

UH-19D (H-19D) ENGINE BACKFIRED and failed. Engine was restarted and failed again. Forced landing on road accomplished with no damage. Cause undetermined pending analysis.

OH-13 (H-13) AFT SHORT SHAFT failed during hovering flight. Forced landing accomplished with no damage. Cause undetermined pending analysis.

UH-19D (H-19D) STRUCK TREES during attempted takeoff from confined area. Incident damage to rotor blade tip caps.

OH-23D (H-23D) STRUCK TREE during approach to confined area. Incident damage to one tail rotor blade and tail boom.

OH-13H (H-13H) STRUCK WIRES during practice autorotation and crashed on right side. Aircraft destroyed. Pilot and passenger sustained minor injuries.

OH-13H (H-13H) ROTOR BLADES struck antenna when soldier with PRC-10 radio strapped to back walked under rotors during engine shutdown. Incident damage to main rotor blades.

OH-23D (H-23D) ENGINE FAILED in flight following loud, steady grating noise. Forced landing accomplished on road with no damage. Cause undetermined pending analysis.

OH-23D (H-23D) SETTLED in scrub tree after partial loss of rpm during attempted takeoff from confined area. Incident damage to rotor blade. No malfunction suspected.

U-6A (L-20A) ENGINE FAILED immediately after takeoff at approximately 50 feet. Forced landing accomplished on active runway with no damage. Caused by fuel pump failure.

OH-13G (H-13G) ENGINE FAILED after 2 hours and 25 minutes of flight. Forced landing accomplished with no damage. Caused by fuel starvation.

OH-13H (H-13H) ROTOR HEAD parted from transmission and struck ground while aircraft was stationary with engine running. Intensive damage to main rotor blade, tail rotor drive shaft, and tail rotor system. Cause undetermined pending investigation. No injuries.

OH-23D (H-23D) STRUCK CERAMIC pipe during ground slide following night autorotation. Major damage to both skids, cross tubes, and cabin skin. No injuries.

CH-21C (H-21C) TAIL CONE SCRAPED runway during practice autorotation. Incident damage to tail cone.

CH-21C (H-21C) STRUCK TREES during aborted takeoff from confined area. Minor damage to main rotor blades. Suspect power loss due to engine malfunction.

OV-1A (AO-1A) HYDRAULIC SYSTEM failed in flight. Gear extended by emergency system. Forced landing accomplished with no damage. Caused by improper installation and stripped threads of drain plug (P/N AN 814 2DL) located on the No. 1 engine hydraulic pump. This allowed fluid pressure to be forced through the plug threads, rupturing the O-ring seal and permitting all hydraulic fluid to be dumped overboard during flight.

OH-13E (H-13E) STRUCK TREE while practicing for firepower demonstration. Incident damage to rotor blade.

OH-13E (H-13E) STRUCK WIRE during reconnaissance mission and crashed in plowed field. Major damage to all components. Pilot and passenger sustained shoulder harness burns on neck and shoulder; minor cuts, bruises, and abrasions on legs and hands; and shock.

OH-23B (H-23B) MADE SCREECHING noise in flight, followed by odor of burning material. Forced landing accomplished with no damage. Caused by failure of cooling fan gear box support.

U-6A (L-20A) ENGINE FAILED during attempted go-around. Aircraft rolled onto soft ground and nosed over, causing sudden stoppage of engine and minor damage to propeller. Cause of engine failure undetermined pending analysis.

O-1A (L-19A) POWER FAILED during maximum performance takeoff from field strip. Aircraft touched down in plowed field and turned over. Major damage to all components. Suspect fuel starvation. No injuries.

CH-34 (H-34) ENGINE FAILED in flight. Forced landing accomplished with no damage. Caused by failure of No. 9 cylinder.

OH-13E (H-13E) TOUCHED DOWN tail low on left skid during demonstration autorotation. Main rotor blade flexed and struck rear short shaft. Incident damage to tail rotor drive rear short shaft and one main rotor blade tip.

O-1A (L-19A) OIL TEMPERATURE rose rapidly from 80 to 100° and oil pressure dropped to zero approximately 10 minutes after takeoff. Oil temperature returned to normal and oil pressure rose to 5 psi. Forced landing accomplished with no damage. Caused by worn oil pressure relief valve sleeve.

CH-21C (H-21C) CHIP DETECTOR warning light came on in flight. Forced landing accomplished with no damage. Cause undetermined pending analysis.

OH-23D (H-23D) TOUCHED DOWN tail low during practice autorotation. Incident damage to tail rotor blades, aft tail rotor drive shaft, lateral snubber, forward spring tube assembly, and skid leg.

OH-13G (H-13G) LOST POWER in flight. Forced landing accomplished with no damage. Caused by burn on exhaust side of No. 5 cylinder and overheating of No. 1 and No. 3 cylinders.

O-1A (L-19A) STALLED and settled into trees during attempt to climb 35° mountain slope after simulated attack on troops. Major damage to both wings, left fuel tank ruptured, cowl, left stabilizer, propeller, and sudden engine stoppage. Downdraft possible contributing factor. No injuries.

OV-1A (AO-1A) CARTWHEELED during attempted go-around. Pilot sustained fatal injuries. Caused by feathering No. 1 propeller due to improperly set torque pressure switch. Switch was set to operate at 35.5 psi instead of correct setting of 7 psi plus or minus 2. Investigation revealed marks on switch, indicating adjustment ring had been forcibly rotated with screwdriver.

Shortly before press time we caught our overambitious sweeper on his way to the incinerator with some of our copy for this issue. Hence...

Bits aND PIEces

NYLON AND SKIN

In a recent helicopter accident the pilot was badly burned around both ankles. The severity of the burns was the result of his wearing nylon socks and walking shoes.

Nylon is a thermoplastic material. A thin thermoplastic material will disintegrate and disappear in the presence of heat, leaving the underlying skin exposed; a thicker thermoplastic layer will melt and fuse into the skin and underlying tissues, causing severe damage.

Nylon should not be worn next to the skin in any position where it may be exposed to flames or flash. Nylon watch straps must be singled out as offering the greatest risk because of the exposed position and the presence of important nerves to the hand running fairly close to the skin in the region of the wrist. Nylon socks when worn with walking shoes are also obvious bad risks.

U. S. Naval Aviation Safety Center

After takeoff, the landing gear of a U-8D malfunctioned. Emergency procedures to secure the gear were unsuccessful, and an attempt was made to raise the floorboards and lock the gear down with the chain drive. While this was going on, the cockpit filled with smoke from the landing gear motor. An immediate landing was made, and the gear collapsed during the roll. Carbon monoxide poisoning was suspected because of the development of nausea after the smoke entered the cockpit. Symptoms of headache and slight nausea persisted for 36 hours and were present to about the same degree in both occupants. The aircraft oxygen equipment, though available and serviceable, was not used...

AFTER THE CRASH FACTS

Injury--wound, lacerated, head. Causative agent--rotor blade. In this case the pilot was injured because he removed his helmet before exiting a crashed helicopter, then walked into the slowly revolving blade.

Another pilot, following a crash, said: "I can recall seeing the bubble shatter, the instrument panel break loose forward, and the main rotor blades strike the ground directly to the front. I removed my helmet, the crewchief cut off the switches and fuel..."

BITS AND PIECES

General aviation will rack up about 13.5 million flying hours and 1.7 billion miles during 1962, according to Dr. Leslie A. Bryan, Director, Institute of Aviation, U. of Illinois. There are about 80,000 general aviation aircraft in the U. S. compared to slightly over 2,000 "public" aircraft. Added to all this activity are flights by government agencies, including the armed services. It is easily seen that the mid-air collision problem remains a serious threat to flight safety.

MATS FLYER

ARE YOUR CRASH CREWS TRAINED AND CURRENT?

An O-1 stalled out, struck the ground, skidded for a short distance and stopped right side up. There was a post-crash fire from ruptured fuel lines and this caused the death of both occupants. Gasoline poured into the front cockpit from ruptured fuel tanks and lines, soaking the pilot immediately with flaming gasoline. Fire fighting equipment arrived on the scene in about two minutes, but four to six minutes passed before the equipment was operating. An early attempt was made to remove the passenger (not yet burned) but the rescuer could not work the shoulder harness--lap belt release. The fire intensified, and no further rescue could be accomplished. There seemed little doubt that had the would-be rescuer been familiar with the harness release device, one fatality could have been averted.

FLIGHT SURGEON'S TECHNICAL REPORT OF U.S. ARMY AIRCRAFT ACCIDE

1. NAME (Last, First, Middle Initial) Lucky, Cranium R.

Date: Summer, 1962

SECTION D SAFETY AND PERSONAL EQUIPMENT

Prepare a narrative account of failed items on reverse side. Identify each item discussed (e.g., D-2, D-5, etc.). Include recommendations for improvement in Sec

GENERAL DESCRIPTION OF EQUIPMENT	AVAILABLE YES	AVAILABLE NO	UTILIZED YES	UTILIZED NO	FAILED YES	FAILED NO
2. PROTECTIVE HELMET	X			X		
3. SHOULDER HARNESS	X		X			
ER HARNESS REEL	X		X			

MODEL OR TYPE APH 5

SECTION E EJECTION, BAILOUT, GROUND ESCAPE

X 1. WATER ESCAPE		BAILOUT	
GROUND ESCAPE		EJECTION	
3. ATTITUDE OR MANEUVER OF AIRCRAFT AT EXIT	Aircraft lying on left side with left wing torn off.		NO ESCAPE (Explain on reverse side)

ESCAPE (S-suspected, E-established)

10. ASSIST

11. THROWN CLEAR OF AI

2. ALTITUDE AT TIME OF EXIT: ABOVE SEA LEVEL 300; ABOVE TERRAIN 0

4. AIRSPEED

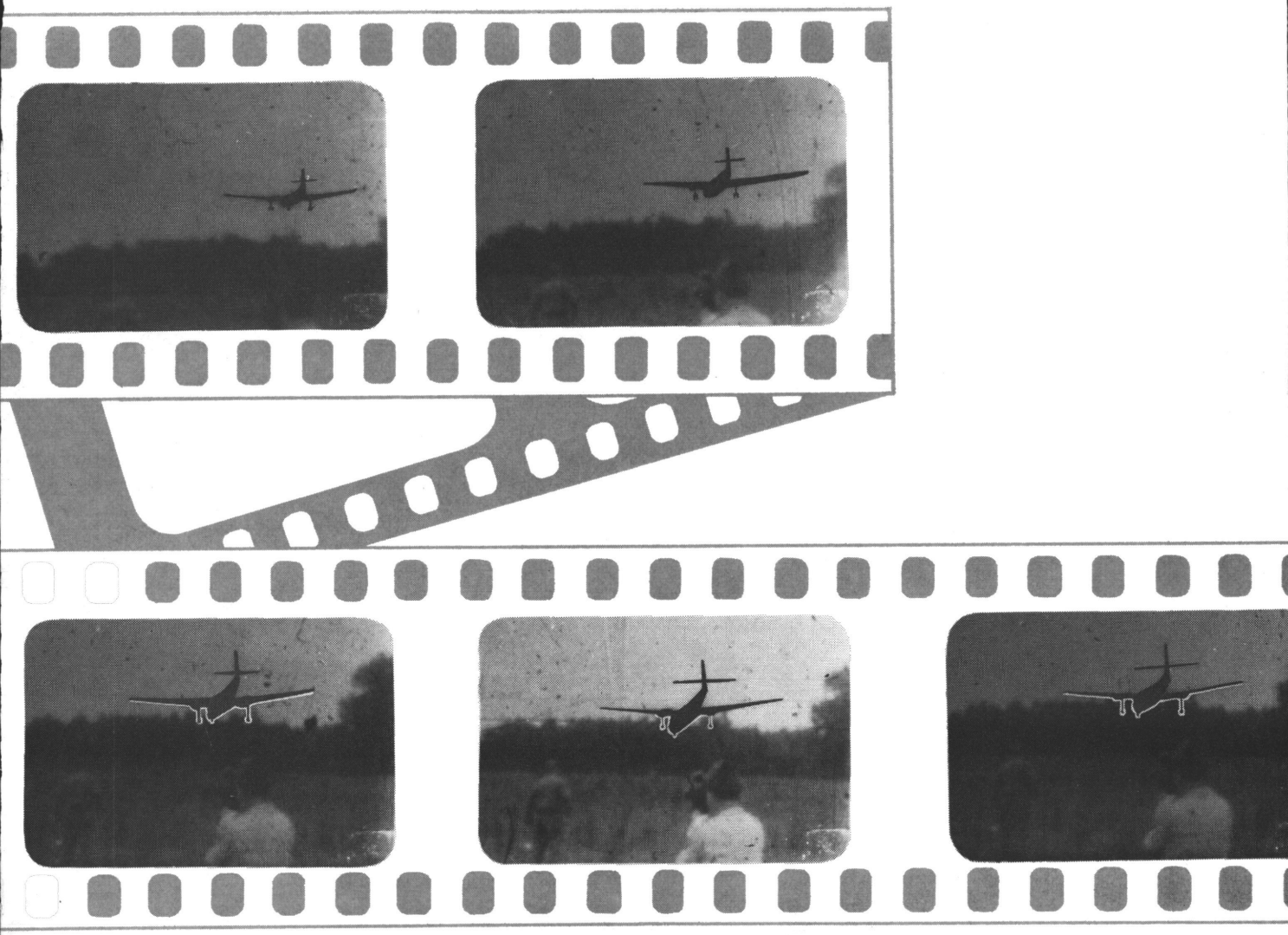
DA FORM 1 APR 61 2397-7

FROM THE UNITED STATES ARMY BOARD FOR AVIATION ACCIDENT RESEARCH

prepared by
THE U. S. ARMY BOARD
FOR
AVIATION ACCIDENT
RESEARCH

CRASH SENSE

scene 1 take 1 ligh



s! camera! action!

INTERCOM recordings from the rumor factory—

"Say, did you hear about the Caribou at——?"

"Naw. What happened?"

"They were putting on a demonstration for some high brass. Guy made a normal landing, started taxiing in and the left wing fell off!"

"Hey, Joe! Wait up! D'you hear about the Caribou accident?"

"Yeah. I heard the wing fell off on short final. Seems hard to believe."

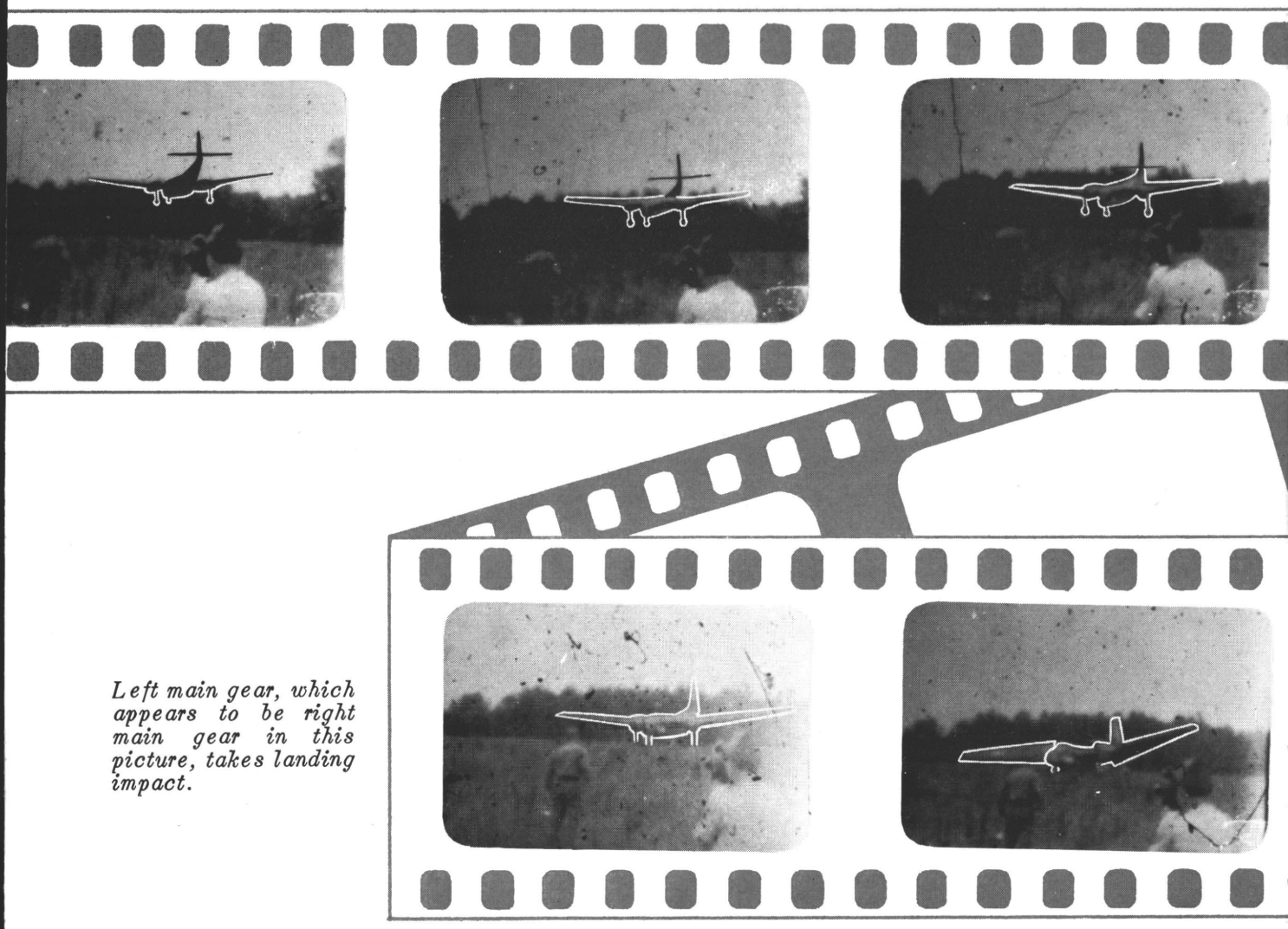
"It's gospel! I got it from Hank, and his girl's cousin saw it happen!"

"They say some guy dropped it in the day before and didn't write up a hard landing."

"Naw, he was taxiing down a road and the wing hit a tree!"

THANKS TO A SPECTATOR with a steel nerve, a steady hand, and an 8mm movie camera, CRASH SENSE is able to squash these little gems and others like them with a movie sequence of the accident as it really happened.

While the movie film was of good quality and showed up well on a screen from an 8mm projector, its size limited enlargement and reproduc-



Left main gear, which appears to be right main gear in this picture, takes landing impact.

tion. Because of this, our illustrator had to touch up the prints by darkening the aircraft as it appears on the approach and outlining it in white as it drops below the treeline. Also, we had to settle for contact prints from the enlarged negatives and this made the aircraft appear to move from right to left, the reverse of the actual sequence. If your imagination isn't strong enough to turn the pictures around, hold these pages up to a mirror and you'll see it just as it happened.

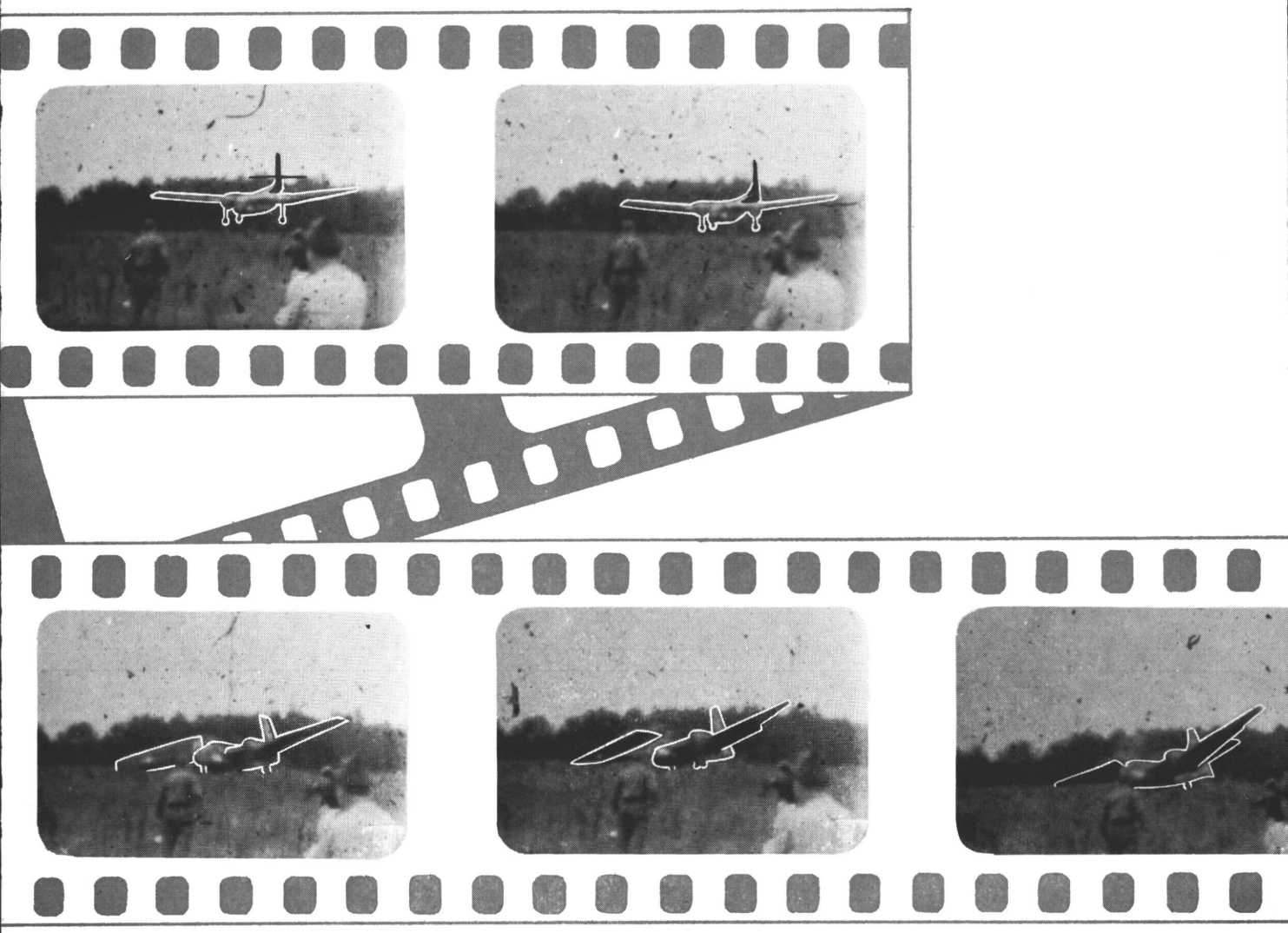
The aircraft was on a demonstration flight in support of field tests with an internal load of JP-4 fuel. Takeoff weight was computed as 25,111 pounds and estimated landing weight was 24,461 pounds. Aboard were the pilot, copilot, and four enlisted crewmen.

For a description of the accident, we have extracted excerpts from

THE PILOT'S STATEMENT

". . .We were to land in a field adjacent to the field in which the practice demonstrations had been conducted for the past three days. It would be the first landing in this field. The field had been reconned on foot by representatives of the —— Aviation Company.

"The approach was made at treetop level (approximately 50 feet over the trees) to the intended landing area. Upon locating the field I had to turn slightly to final approach. I started slowing the aircraft down to 70 kt indicated and had 30° of flap as I approached the final barrier (trees). I was carrying sufficient power to maintain altitude and 70 kt airspeed. As I approached the barrier I asked the copilot for 40° of flap. As the flaps came down the aircraft began to ascend, causing me to note that I had excessive

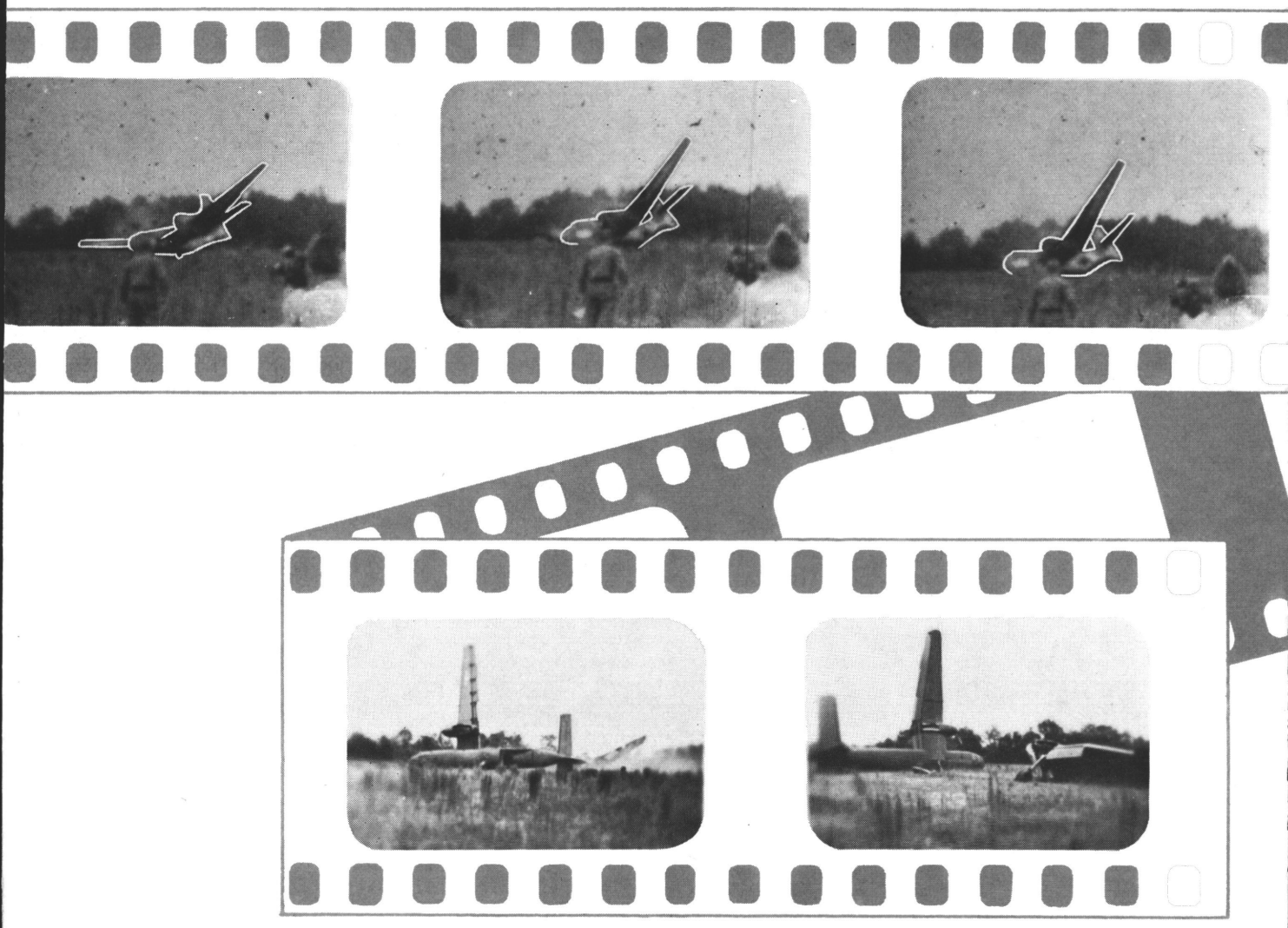


speed (70 kt) for this flap setting. I pushed the nose of the aircraft over to begin my very short final from the trees to the ground. At this time I removed all manifold pressure.

"The aircraft settled neatly and as I made the round-out it stalled about 3 feet above the ground. Three feet was higher than I intended, but adequate, and the attitude of the ship was 3 point with the nose slightly high. As the ship struck the ground and in the moment that I was waiting for the nose wheel impact to apply final braking action (I had partial brakes applied on contact), I realized that I had not received shock action from the landing impact of the left main gear. I glanced out the left window and observed the left engine and wing settling toward the ground. I attempted to hold the ship straight with the nose wheel until control was lost.

"As the ship touched down it continued through the left gear, settling over on the left side and slid to a stop. Upon realizing that the ship was going over on its side I started for the mixture levers. The aircraft movement caused my hand to strike the right throttle and the right engine to surge slightly. I immediately went to the throttle to remove the power again. I was apprehensive that the ship would roll. The copilot had the mixture in the OFF position by the time I could move my hand, so I turned the mag switches off and then the master switch.

"As the aircraft came to final rest I directed the immediate evacuation of the ship and then followed the crew out, making my exit from the copilot window."



THE ASSISTANT DEMONSTRATION PROJECT OFFICER'S STATEMENT

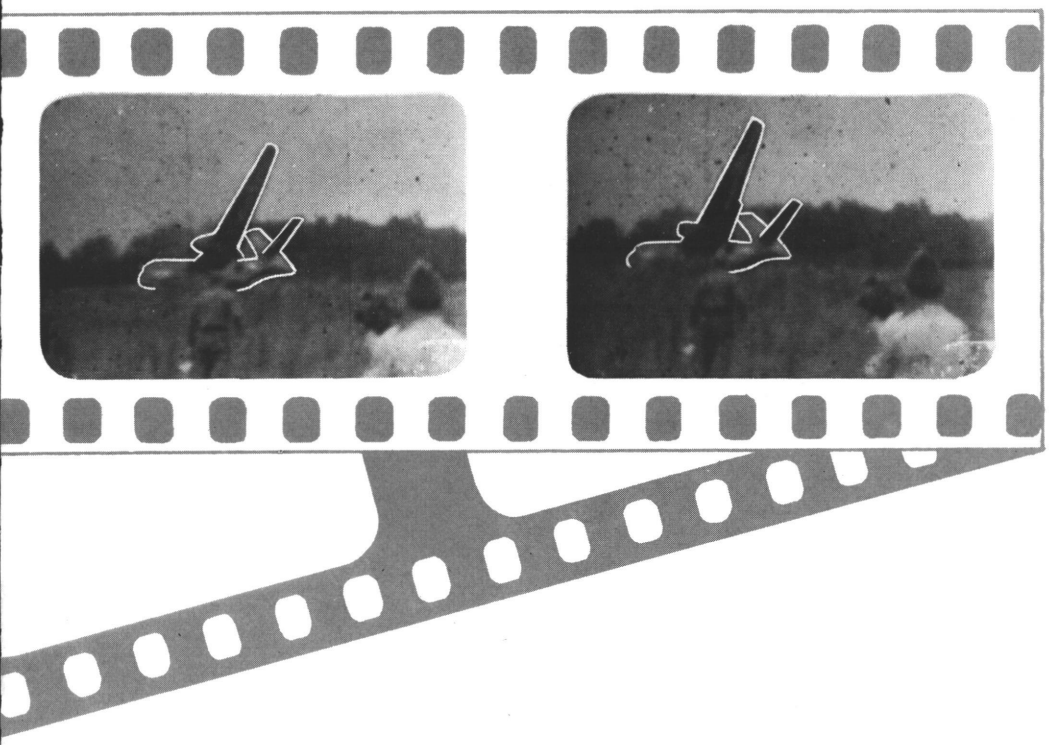
". . . I picked up the CV-2A [AC-1] aircraft in my line of sight from my ground control position about 30 seconds out from touchdown. He was coming in slightly to the right of the correct approach position, just a few feet above treetop level and appeared to be trying to adjust to the left. He dropped in altitude sharply after clearing the trees as planned. At the moment of impact I was looking directly into the rear of the aircraft from my position. The aircraft appeared to hit exceptionally hard, causing a spray of sand and weeds forward. . . ."

The Caribou settled on its left side, coming to a stop 232 feet from the initial touchdown point and 60° left of the landing heading. There were no injuries and fire did not occur.

A review of aircraft records revealed a total of 547 hours on the airframe. No hard landings were recorded on previous flights. There was no evidence of any previous structural damage.

The pilot had a total of 2,743 flying hours, 161 of which were in CV-2A aircraft. The copilot had 1,198 hours total, of which 179 were in CV-2A aircraft. Both were qualified by Army and local command standards to perform the mission

Though it had no bearing on this particular accident, it was noted that both pilot and copilot had APH-5 helmets, *but were not wearing them at the time of the accident.*



Arrow shows where left wheels first hit

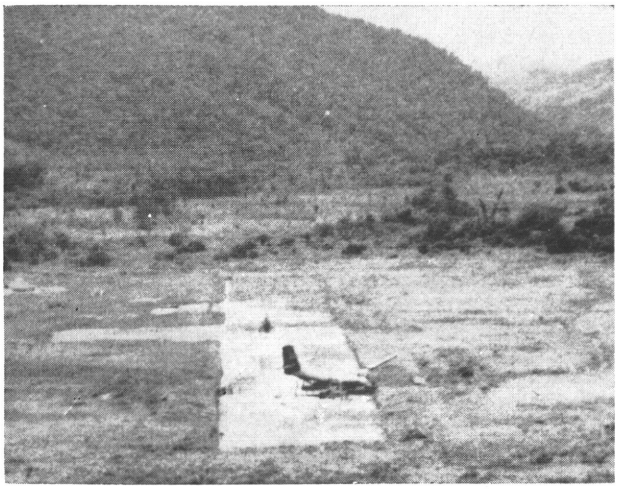
The damaged wing section was taken to a laboratory for analysis and it was determined that the wing had failed under forces beyond its design limits. Microscopic examination ruled out any possibility of a materiel factor.

When this movie film was developed, the cause came to light. Knowing the speed at which the film was exposed, and calculating the height of the aircraft at the beginning of the sequence, engineers were able to compute the vertical component of impact on the left main gear at 19 feet per second. With a gross weight of 24,461 pounds, the ultimate design strength of the CV-2A wing is for 14.5 feet per second.

In short, the aircraft wasn't built to fly or stall into the ground at 1,140 feet per minute descent.

". . .As the flaps came down the aircraft began to ascend, causing me to note that I had excessive speed (70 kt) for this flap setting. I pushed the nose of the aircraft over to begin my very short final from the trees to the ground. At this time I removed all manifold pressure . . ."

Several weeks later the rumor factory was going full blast again—



Approach into gusty crosswind from right

Right wheels struck dirt mound here

"I hear another Caribou wing fell off."

"Yeah. It was taxiing along just like the first one. Wing fell off for no reason."

"Naw. I heard he hit a tree on the approach."

"He must have been overloaded."

We can't show you a movie of the second accident, but still shots taken at the scene tell the story—

With a pilot, copilot, crewchief, and 31 passengers aboard, the Caribou took off from point A for a 20-minute flight to point B and a landing on a 1,500-foot field strip. Landing weight was computed at 27,915 pounds.

Surface wind was from the right, gusting 10-15 knots. A 4-foot mound of dirt, hidden in tall weeds, lay across the approach end of the strip.

On short final, right wing low to correct for the crosswind, the aircraft hit turbulence and a downdraft caused by a gully. The right wheels struck the dirt mound 2 feet from the top and the impact sheared the right wing at the root. The Caribou pivoted around and slid to a stop.

Moral: One go-around is worth many attempts to salvage a messed up approach.

Weeds from mound hang from right wheels

Peaceful Injun

Lieutenant John H. Greene

CHALK UP ANOTHER "first" for Army Aviation! Although the Iroquois Indian fought our ancestors 200 years ago, his present-day namesake, the Army's UH-1B [HU-1B] Iroquois, blazed a peaceful trail 11,000 miles away at the very bottom of the globe in pursuit of scientific knowledge.

Operating as part of the Navy's Operation DEEP FREEZE, two Army UH-1Bs supported a mountain-hopping topographic survey described by the National Science Foundation and U. S. Geological Survey as "one of the most ambitious map control projects ever undertaken in the Antarctic."

The project, dubbed TOPO-SOUTH and NORTH, started from Plunkett Point, less than 300 miles from the South Pole. It extended northward through the rugged chain of mountains bordering the Ross Ice Shelf to Cape Roget, just north of Hallett Station. This is a distance of 1,100 miles, as the crow flies, and is roughly equivalent to a stretch from Washington, D. C. to Key West, Florida.

The turbine - powered Bell UH-1Bs were manned and maintained by a detachment of the U. S. Army Transportation Board, a unique world-traveling, trail-blazing organization well versed in far-flung environmental operations. Operating from Pole to Pole in the past several years, it has conducted operations in the most desolate and varied terrain known to man, from Project LEAD DOG in the Arctic, to Project SWAMP FOX in Panama, and finally, TOPO-SOUTH and NORTH in the Antarctic.

Since weather is the major factor in the Antarctic, a brief description is required. Antarctica is the world's largest icebox. Under all this ice lies a continent as large as the United States and western Europe combined, with ice plateaus of 13,000 feet and mountains over 15,000 feet. Numerous glaciers, ice tongues and crevasses abound, making surface travel hazardous. Flying in this environment is not boring and provides a thrill-a-minute.

The New Zealanders, or "kiwis," as they are called, still rely on dog teams for transportation. One must have admiration for these rugged animals on one hand and feel great sympathy for them on the other. They perform nobly in the fierce frozen elements, despite the fact that not a single tree, bush, or even fireplug is to be found anywhere within the millions of square miles of icy desert.

Survival is the first order of business. No animal or plant life exists within the interior, although seal, penguin, and killer whale can be found along the continental periphery. A world record low of −152° F has been recorded and temperatures average 30° colder than in Arctic regions. Since there are no trees to furnish fuel or shelter, and no edible roots, leaves, or berries, living off the land is an impossibility.

The unfortunate crew of a downed aircraft can only hope to survive for as long as food supplies can be stretched. Walking out is an impossibility, since a man cannot sled-haul enough food to accommodate his tremendous appetite of 5,000 to 6,000 calories a day.

If forced down, STAY WITH YOUR AIRCRAFT! File a flight plan specifying the exact routing and do not deviate without notifying someone. Prepare immediately for a survival situation and "hibernate" in your sleeping bags to conserve strength and food. This is very important.

Flight crews tend to become complacent when flying high above the elements enclosed

---

Lt Greene is with the U.S. Army Transportation Board, Ft Eustis, Va. He served as OIC, Task Detachment #3, Antarctic Liaison during Operation DEEP FREEZE.

Engine change atop Mt Discovery. The altitude is 10,500 feet and it's about 25°F below zero

within their own manmade environment. The crew of one large aircraft crashlanded within sight of an active station and, feeling sure rescue was imminent, failed to establish a proper campsite. Several days passed "waiting it out" in the wreckage, resulting in several fatalities and numerous amputations of limbs. It is not uncommon to encounter temperatures of 20 or 30° F below zero during the Antarctic summer. Coupled with high winds, this cannot be treated casually.

The basic survival gear consists primarily of shelter, fuel, and plenty of food. No weapons need be carried since wild animals pose no problem — there are none! In its simplest form the Antarctic is an extremely rugged, desolate area presenting the greatest challenge for survival or search activities. Men must be in top physical and mental condition to survive. But enough of survival.

The mission required the landing of USGS surveyors on selected mountain peaks for measuring elevation, distance, and angles to surrounding peaks. When computed, the recorded findings will be used with existing aerial photographs to produce the first accurate maps of 100,000 square miles of Antarctic wilderness. A 90 percent reduction of time was realized by using helicopters. Dog teams, the prime movers in the past, would have required a 3 to 5 year period to accomplish the same work.

USGS surveyor on mountain unload equipment from an UH-1B

Of the 68 sites established, 30 were above 10,000 feet, the highest being Mt Usher, 13,500 feet pressure altitude. These landings were accomplished carrying two pilots, two surveyors and equipment, plus the survival gear and miscellaneous maintenance equipment. Gross weight at takeoff was 7,400 lbs.

Landing performance, even with the UH-1B's powerful T53-L5 engine and wide chord main rotor blades, was marginal at the extreme altitudes because of the high payload. All approaches had to be shallow and slow, maintaining a high engine speed. The turbine engine accelerates very slowly at high altitude (characteristic of all turbines) and any approach steeper than approximately 5° invites disaster.

Approaches to these vast snow - covered mountains are further complicated by a lack of surface definition, even in perfectly clear weather, which causes some loss of depth perception. This is a recognized phenomenon termed "empty field myopia" and occurs when there is little for the eye to focus upon.

The cold (−30° F), dry temperatures at these altitudes produce fine crystalline snowflakes which billow up from the rotor downwash obscuring vision. An

immediate transition to instruments is imperative before all reference is lost for a go-around. Several approaches may be required to blow away the loose snow for a safe landing.

Visibility falls in two categories, good or bad. Objects 150 miles distant can be seen clearly, which is confusing. Visibility less than 7 miles approaches "white-out" conditions. When this is encountered, a landing must be accomplished quickly unless the aircraft has suitable instrumentation. Suitability includes radar, radio altimeter, Doppler, etc. Radio navigational aids are almost nonexistent in the Antarctic.

A "white-out" occurs when a relatively thin, uniform layer of cloud obscures the sky. Sunlight filtering through the clouds becomes diffused and is reflected back by the snow surface, increasing in intensity. Surface definition becomes poor as snow and cloud-covered sky blend into one and may be likened to "living in a milk bottle." No shadows are to be seen and although actual visibility may be good, objects seem to float in space. Even walking produces vertigo and it certainly is no time to attempt VFR flight.

Maintenance requirements are much higher in this type environment and the Army mechanic should never be "sold short." All maintenance was performed in the open which imposed severe hardships and fatigue on the mechanic. As a result of high altitude engine starting tests, an engine change was required atop a 10,500-foot mountain while enduring high winds and temperatures of −20° F. No easy feat at sea level, the change was completed in one day.

Engine starting procedures at high altitude still present problems. Little information is available and experience gained in the Antarctic indicates that attempted starts above 8,000 feet become critical whether using the GOVERNOR or EMERGENCY fuel control position. The starter is unable to accelerate the compressor to a sufficiently high rpm to assure adequate air delivery to the combustor. Tailpipe temperatures rise rapidly and are difficult to control at these extreme altitudes.

A problem also exists when water freezes in the fuel cell and boosts pump sumps; this is surprising considering that temperatures are well below freezing at all times. Fuel is delivered in barrels and the barrels absorb the sun's rays, raising the internal temperatures to well above freezing. Some water escapes filtering and accumulates in the sumps where it freezes, preventing fuel drainage or operation of the boost pumps. Frequent draining after refueling is one solution.

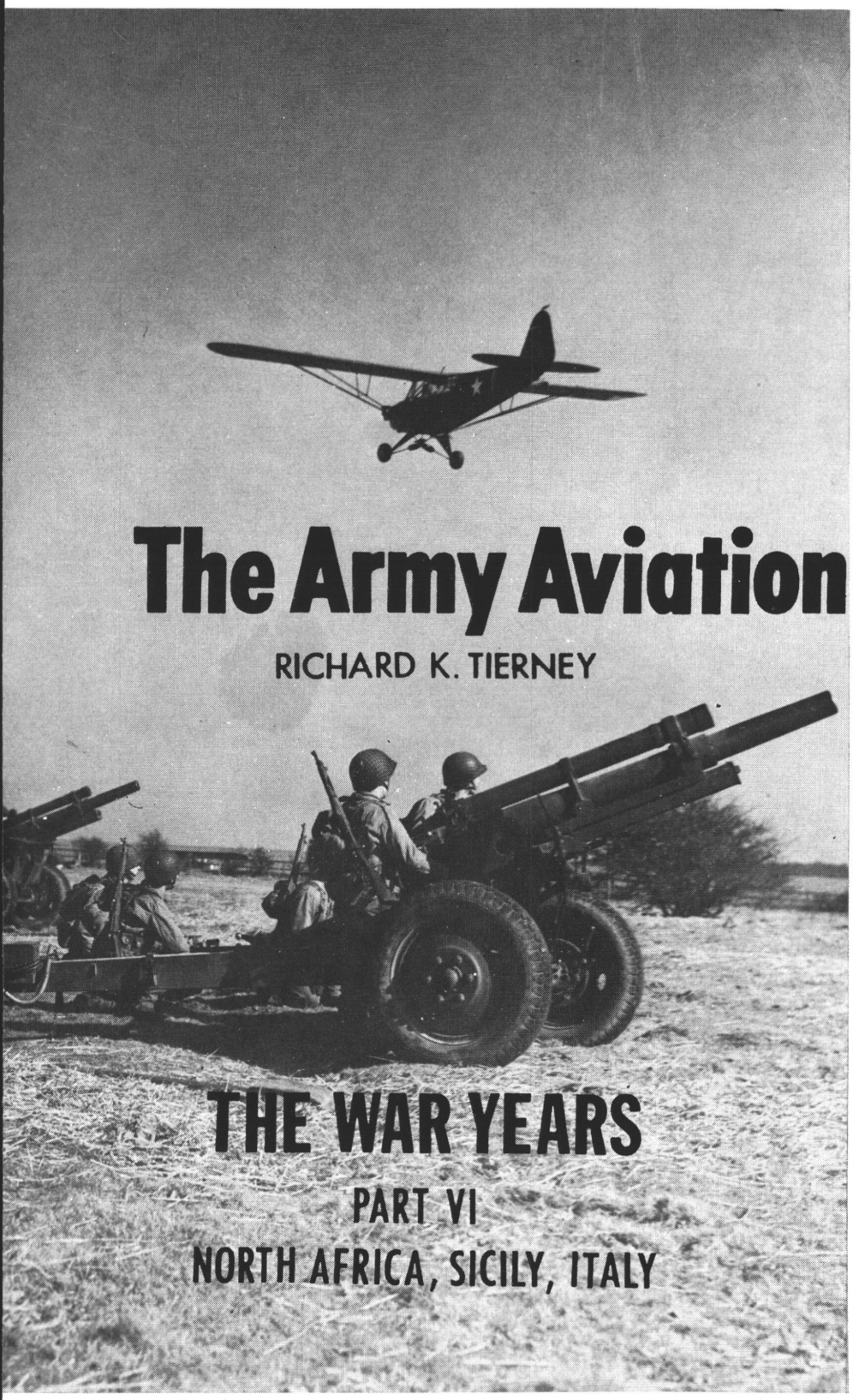
The UH-1B is ideally suited to polar regions. Maintenance requirements are low due to the ease of maintenance features incorporated in the basic design. No heavy, bulky pre-heating equipment is required and the availability rate is exceptionally high. The performance of the aircraft is outstanding at high altitudes. This provides Army Aviation with an added capability previously unattainable.

Support of the Army and USGS team in the field, delivering food, fuel, and moving the campsite, was accomplished by the Navy's Air Development Squadron Six (VX-6). The operation was also unique in that all the services were involved, supporting some phase of the project (Army, Air Force, Navy, Marine Corps and Coast Guard).

The Antarctic is like a magnet, attracting some, repelling others; it is either loved or hated. No intermediate emotions exist. Why do people journey to this isolated, ice-bound continent separated from its nearest neighbor by 2,000 miles? The reasons are as diverse as man himself: the pursuit of science, the great adventure, career advancement, the thought-provoking isolation, the testing of one's skill and endurance, or perhaps, as someone else stated so well, "because it's there."

Operations in the Antarctic pose problems, but they are not insurmountable. Operations under all environmental conditions are a challenge that Army Aviation must meet if it is to provide the field commander mobility on a worldwide basis.

Refueling at a previously established fuel cache on TOPO-SOUTH



The Army Aviation Story

RICHARD K. TIERNEY

THE WAR YEARS

PART VI

NORTH AFRICA, SICILY, ITALY

I believe that the Army of today has a much keener appreciation for the value of observation aircraft than did most of our commanders in World War II. I used light planes frequently in both training and combat situations in World War II because they permitted me to observe in a few minutes what it would have taken days to observe by any other means. I found invaluable the panorama of the terrain and the dispositions of forces that I could quickly fix in my mind when I could observe from the air. Then when I later studied the situation on a map, I could envision much more clearly the exact lay of the land. This was tremendously helpful in the overall direction of the Fifth Army and it was of particular value in evaluating terrain and its influence on the courses of action I selected.

General Mark W. Clark

Army Aviation hung by a thin thread in the fall of 1942. Within the Army Ground Forces only a small group of Artillery officers, located primarily at Fort Sill, knew of or believed in Army Aviation. Ranking members of the Army Air Forces, located primarily in Washington, also were aware of the existence of Army Aviation, but did not feel that aircraft should be organic to ground forces.

Often the Army's liaison pilots had good reason to be discouraged. For example, when Lt O. Glenn Goodhand (now Brig Gen) completed training in Pilot Class No. 3, he was assigned to the 35th Field Artil-

lery Regiment at Camp Shelby, Miss. Upon arrival in December 1942, he found that the officers in charge did not expect him and knew nothing about liaison pilots. Shortly thereafter Lieutenant Goodhand was joined by Staff Sergeant pilots Ray Smith, Leonard Dennis, and James G. Frye.

This group was faced with a typical problem encountered by other liaison pilots joining units throughout the Army. They had to prove the worth of the light airplane to the artillery commander and to make *him* realize that it was an indispensable addition to the ground combat team. This was accomplished, thanks to the dedicated efforts of those who conducted the Army's aviation training program and to the esprit de corps and ingenuity of the liaison pilots who flew the light planes into combat.

The first liaison pilots reporting to combat units in World War II did not always get a hospitable reception. But none received a more disappointing or hostile reception than the first four Army Aviators who entered the combat zone.

The story of Army Aviation's initial entry into combat actually began on 10 October 1942 at Fort Sill, Okla., when Capt Ford E. (Ace) Allcorn (now Colonel, retired, and with the McDonnell Aircraft Corp.) was ordered to report to the 3d Infantry Division at Camp Pickett, Va.

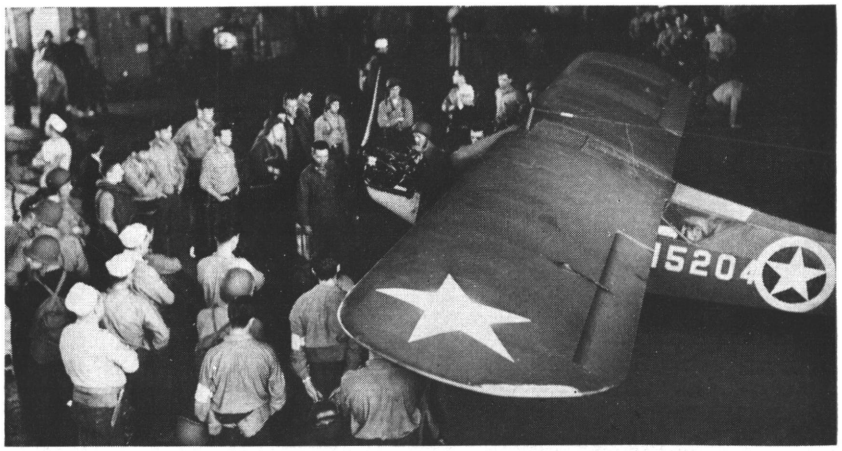
A group of liaison pilots had been assembled at Pickett. Captain Allcorn was directed to pick three aviators from the group and report to the 3d Infantry divarty commander who was at Hampton Roads, Va. Captain Allcorn selected Capt Brenton A. Devol, Jr., and Lts John R. Shell and William H. Butler. (Lieutenant Shell was later killed near Mateur, Tunisia, by a German 88 round. At the time, he was the aviation officer of the 1st Armored Division. Lieutenant Butler is now a civilian.)

At Hampton Roads the group was briefed on the forthcoming invasion of North Africa. They were told that three Army Air Force YO-59s (L-4s) were aboard the aircraft carrier *USS Ranger* and that they were to fly them ashore during the invasion.

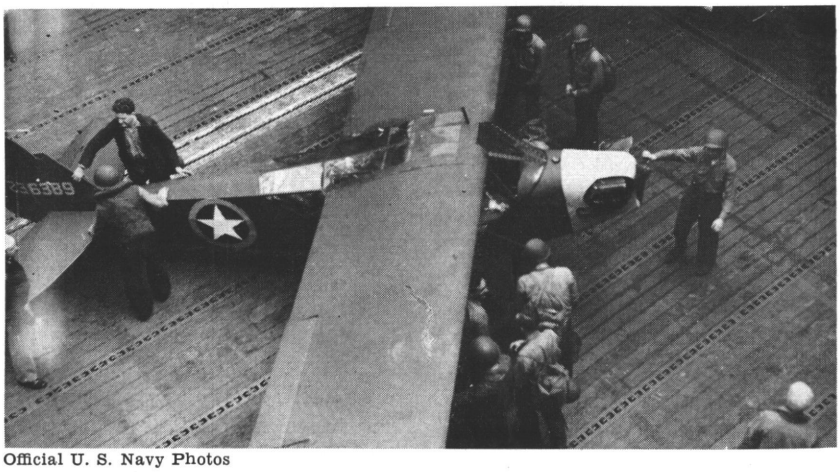
After receiving the necessary maps of the beachheads in the invasion area, Captain Allcorn and his group boarded the destroyer *USS Dallas* and were carried to Bermuda where they transferred to the *Ranger*.

The four liaison pilots soon discovered that the Cubs on the *Ranger* were in bad condition. It was necessary for the group to spend the greater part of the trip from Bermuda to North Africa working on the aircraft. Since they expected to be directing artillery fire during the invasion, the Army Aviators installed SCR 609 radio sets in the Cubs.

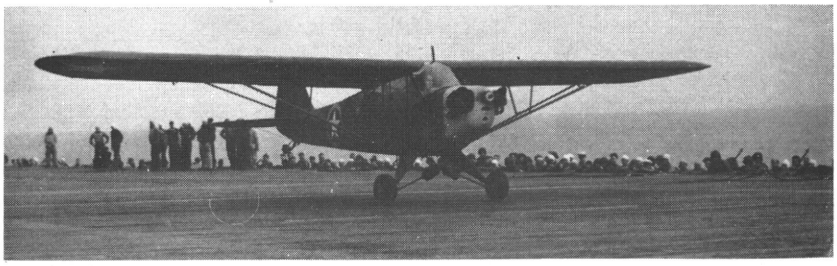
When the invasion began on 8 November the Army Aviators were placed on alert. News of the happenings ashore was anything but cheerful: several of the *Ranger's* planes had been shot down by inexperienced



Above, curious sailors watch Capt Ford Allcorn check his L-4 aboard the USS Ranger heading for the North African invasion. Below, an L-4 is brought to the Ranger's flight deck

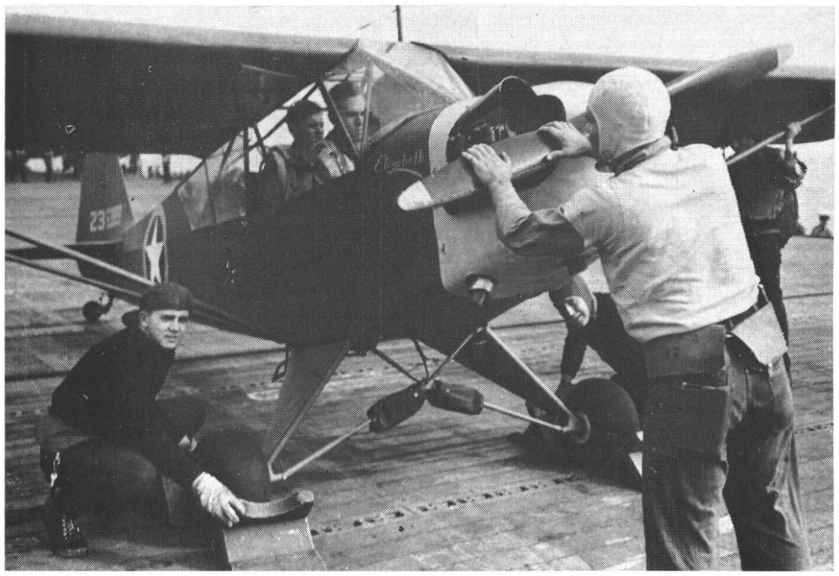


Official U. S. Navy Photos



Above, Capt Ford Allcorn flies his L-4 from the USS Ranger during the North African invasion. Below, Lt William Butler (front seat) and Capt Brenton Devol prepare to take off in their L-4

Official U. S. Navy Photos



American troops on the beach.

On the 9th the Army Aviators got the word to take off. A request that the units ashore be informed that the Cubs would be approaching from the sea was denied by the *Ranger's* skipper, who refused to break radio silence.

The seas were moderate but the *Ranger* had been under torpedo attack and was running at full speed of about 25 knots. Consequently, the aviators had to take off in a 35-knot headwind about 60 miles at sea. "Taking off was no chore," Colonel Allcorn recalls. "Some of the crew held the plane back while I gunned it. I was in the air almost as soon as they let go." Captain Allcorn took off first (in Cub No. 204) and made a 360 before the join-up with the other two aircraft.

The Cubs proceeded toward the beach in an echelon right formation at about 2,000 feet. The plan was to fly to Fedala, where a racetrack had been selected for use as a landing strip. About 3 miles from shore and near the *USS Brooklyn,* it was decided, for no apparent reason, to switch to an echelon left formation. Within seconds after this had been accomplished, Captain Allcorn noticed a gun flash aboard the *Brooklyn.* Almost instantly a round exploded in the position Lieutenant Shell's aircraft had occupied. The three aircraft dived for the surface.

Captain Allcorn passed directly over the bow of a destroyer at about 100 feet and received no fire. However, as he headed toward shore, almost all of the 200 ships in the convoy opened fire on the Cubs with 20 mm guns, despite the fact that they were painted with invasion markings.

Lieutenant Butler piloting one Cub (with Captain Devol riding as observer) and Lieutenant Shell flying the other headed north and away from the invasion site. Later they landed near a French fort and were captured and held prisoners for a brief time.

Meanwhile, Captain Allcorn skipped the waves and headed for the beach. About 100 yards out he turned and headed parallel to the coast for Fedala, receiving fire from shore installations most of the way.

He flew about 3 or 4 miles between the swells until he was off Fedala. When he pulled up to head inland, units of the 2d Armored Division riddled his Cub with .30 caliber machinegun fire. Colonel Allcorn remembers his windshield disintegrating and portions of the cockpit being shot away. He recalls, "I stayed as low as possible and as I got farther inland I realized I was not going to get to the racetrack and that I was getting ahead of the Allied advance."

Suddenly Captain Allcorn was hit in the right leg by a burst from a machinegun. The Cub's engine was also hit, and it burst into flames. He slipped the aircraft into the ground in a controlled crash, then crawled from the cockpit and dragged himself about 50 feet across the ground. He sat up and watched the Cub explode and burn to the ground.

Shortly thereafter, Captain Allcorn was found and taken to

an American first aid station by friendly civilians. He had been hit in the leg five times by Vichy French machinegun fire. Today, he still carries the bullets in his leg, and X rays indicate that they are .25 caliber slugs.

In addition to sharing the honor of being the first Army Aviator in combat, Colonel Allcorn was the first man to fly a Cub from an aircraft carrier, the first Army Aviator to be wounded in combat, and the first to be shot down—which in this case is somewhat of a distinction.

Col Ford E. Allcorn led Army Aviation into combat

In later years Col Robert R. Williams (now Brig Gen and Commandant of the U. S. Army Aviation School) met one of the Navy gunnery officers who had worked the Cubs over. Colonel Williams asked him why they had shot at the Cub. The gunnery officer replied that they had looked through the silhouette charts and didn't see anything that looked like the three aircraft. He admitted that his assistant had said the planes looked like Cubs. But the gunnery officer asked Colonel Williams, "Now, what would you have done in my place? If you were 60 miles at sea and saw a Cub putting by, would you believe it?"

In the following months Army Aviators took their light aircraft into every imaginable combat situation in all theaters of war. They performed admirably and by the spring of 1945 commanders of all the Army's fighting arms were demanding their own light aircraft. This was a complete about face from the situation in November 1942. How did this happen?

This question cannot be justifiably answered in a sentence or a paragraph. It is necessary to view the accomplishments of these Army Aviators step by step in the context of their happenings. One must see reports from the combat areas and watch Army Aviation's seemingly insignificant "feats" become vitally important as they doubled and tripled in number. Then it can be understood why Army Aviation grew into an indispensable ground support force.

REPORT FROM NORTH AFRICA

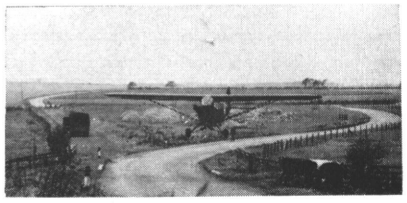
Besides the four aviators who flew from the *Ranger,* others from the first three pilot classes were in the same convoy that participated in the invasion of North Africa. These included Lt John W. Oswalt (now Col and 3d Army Avn Officer), Lt Bob Ely (who later became the first Army helicopter pilot), Lt Eugene P. Gillespie (who became the first man to fly Gen Mark Clark under combat conditions), and Lt Robert Johnson (who was killed in Tunisia). More Army Aviators continued to arrive over the next two weeks on follow-up troop ships with Cubs that had been dismantled and crated. The planes were taken to Casablanca where they were reassembled and assigned to Army liaison pilots.

During late November and early December 1942, the Army Aviators began joining units of the 1st and 2d Armored Divisions and the 3d, 9th and 34th Infantry Divisions. Actual fighting at that time was to the east in Tunisia where British troops were located to the north and south of the German Africa Corps. American forces were being committed only on a "piecemeal" basis to the west and the Army's liaison pilots did not see much action. Consequently, a number of Army Aviators joined the 651st British Squadron of the British 5th Corps in Tunisia. They were to gain combat experience flying British Taylorcraft planes and forward information back to the Department of Air Training at Fort Sill. It was sometime during this period that 1st Lt Paul A. Dewitt became the first Army Aviator to fly an artillery mission in a Grasshopper in World War II.

AIR OP SCHOOL

The II Corps Air Observation Post School holds a significant place in a recount of Army Aviation's role in the North African campaign. Its origins go back to 28 October 1942, when the War Department directed the Field Artillery School to send 10 pilots and 10 mechanics to the 13th Field Artillery Brigade in England. Commanded by Capt Joseph M. Watson, Jr., this was the first group the school of-

A II Corps Air OP School student lands his L-4 in England



ficially sent to tactical units. (See box).

PILOTS
Capt Joseph M. Watson, Jr.
Capt J. Elmore Swenson
1/Lt Stanley A. Williamson
1/Lt Thomas L. Hendrix, Jr.
1/Lt Delbert L. Bristol
2/Lt William D. Stephens
2/Lt Gus M. Albert
S/Sgt Claude B. Allen, Jr.
S/Sgt James S. Rengers
S/Sgt Walton C. Schoonover

MECHANICS
S/Sgt William T. Roulston, Jr.
T/4 Cecil L. Tyner
T/4 Paul F. Leathers
Cpl Walter H. Hasty
T/5 Hugh M. Blair
T/5 Whitney N. Frost
PFC John A. Wagner
Pvt George G. Rogers
Pvt Constantine L. Ryseff
One mechanic unknown

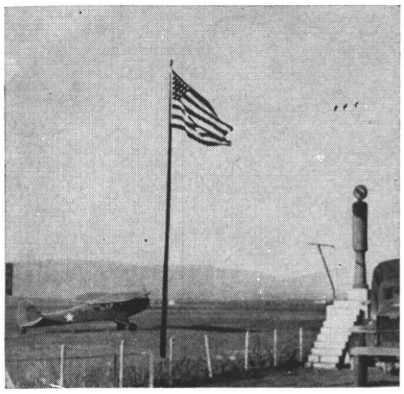
Upon arrival in England the group was mistakenly placed into an infantry replacement battalion. However, Col Francis Bacon, commander of the 34th Infantry Division Artillery, agreed to organize a provisional field artillery battery. It seemed there was no chance that they would see duty as field artillery pilots or mechanics.

However, they had one more hope. Colonel W. W. Ford, Director of the Department of Air Training at Fort Sill, had instructed Lt Delbert L. Bristol to contact Brig Gen A. M. Gruenther if anything went wrong. When General Greunther, Chief of Staff, Hq II Corps, heard Lieutenant Bristol's report he immediately had the group transferred to the 13th Field Artillery Brigade. Upon arrival the group reported to Gen J. A. Crane and learned that they were to become the flight instructor nucleus of the II Corps Air Observation Post School. Students were already on hand and the new "faculty" hurriedly prepared POIs, obtained training aids, textbooks, mechanics from motorized units with little or no experience in maintaining light planes, and ten L-4s which had been earmarked for the 1st Infantry Division.

In late November 1942 Captain Watson was ordered to move the advance echelon of the school to North Africa with the brigade. After arrival at Oran by ship convoy, the school was ordered to establish a forward instructional flying field and charged with the mission of training pilots and mechanics for both I and II Corps. (The rear echelon of the school, under the command of Lt Col John Salmon, did not arrive until about 15 February 1943.)

The advance echelon set up shop on a strip of grass along the edge of an olive grove at Sidi-bel-Abbes. The faculty and students lived in wooden crates in which their planes had been shipped. A little paint and "backyard" carpentry made the crates liveable. Overall morale was quite high. The school had an "official" mascot, a goat named Billy the Kid, and in the evenings a group could usually be found around a campfire singing the Battle Hymn of the Grasshopper.

An L-4 passes the flag at the Air OP School in Algeria



The school was essential to fill combat needs, but its graduates were not placed on flying status. In accordance with War Department policy, only graduates of the Department of Air Training at Fort Sill were eligible for flight status. As a compromise the War Department placed the "overseas" graduates on a nonrated flying status and allowed them $60 a month hazardous duty pay.

In January 1943, the first Air Observation Post sections were formed within American tactical units in North Africa. Lieutenant Oswalt organized the 1st Armored Division Air Section with the assistance of Lts John R. Bannister, III, and Edgar Alexander. The 1st Infantry Division Air OP Section was organized by Lt Jesse Overall, III, (now Lt Col and comptroller at the Army Aviation School, Fort Rucker). Lieutenant Overall was assisted by Lts William H. Butler, Bryant and Rich, and Staff Sergeant pilots Clifton R. Wamsley, Cole and Harper. (First names not available for Bryant, Rich, Cole and Harper.)

Captain Delbert Bristol (now Colonel) organized within the II U. S. Army Corps a senior tactical headquarters to control employment of the division Air OP sections. Besides keeping up with tactical employment, Captain Bristol as II Corps air officer also made aviator assignments, handled flight records and other administrative matters, and established the first parts supply system in the combat zone for the Artillery's planes. This was a function of the Army Air Forces, but the responsibility had been overlooked while stocking overseas maintenance support units.

In June 1943 Major Bristol made another significant contribution to the Army's light aviation program when he inaugurated night flight training at the II Corps Air OP School. The L-4B was used as a trainer and since few instruments were available, most of the precision in night flying depended on the pilot's skill.

Originally it was believed that the Artillery pilot's flights would last only about 7 minutes. They would fly out, adjust the artillery fire, and return to the landing strip before the enemy could knock them down. However, the liaison pilots in North Africa soon learned it was possible to stay in the air for lengthy periods. Reasons for this included the Cubs' low level maneuverability; fewer attacks by enemy fighter planes as air superiority was won by the Allies; the effective protection afforded the Cubs by friendly antiaircraft batteries; and the fact that the enemy was becoming increasingly aware that when he was spotted by an Artillery pilot there soon followed a deadly artillery barrage.

With the Cubs spending more time in the air, the liaison pilots found more and more missions they could readily accomplish in support of the ground troops. The original mission, adjustment of artillery fire, was being improved from lessons learned in combat. For example, the pilots found that flashes from artillery guns were easiest to see at dusk. They also quickly learned to memorize the positions of friendly antiaircraft batteries, since enemy fighter plane pilots would not knowingly chase them into areas around these islands of safety. Such reports were continually forwarded to the Department of Air Training where the curriculum was frequently revised to better prepare the students for the combat awaiting them.

Adjustment of artillery fire and counterbattery fire became more effective as the African campaign continued. At El Guettar the liaison pilots did an outstanding job. In March 1943 Air OPs of the 1st and 9th Infantry Divisions uncovered a major thrust being launched by the German 10th Panzer Division. A withering artillery barrage directed from the air helped stop the assault, and a penetration of the Allied lines was averted.

During the Tunisian Campaign two grasshopper pilots turned normal flying missions into a first for Army Aviation. Staff Sergeant liaison pilot Frank A. Perkins and Lieutenant Bollard (first name not available) are credited with capturing six German prisoners of war. This is the first case on record of prisoners being captured by airplane pilots in World War II.

The incident occurred along the Mediterranean coast between Carthage and Bizerte. Sergeant Perkins observed another grasshopper, flown by Bollard, circling six German soldiers on the beach. The two liaison pilots landed and captured the Germans with their .45 caliber pistols. Sergeant Perkins and a Signal Corps photographer who had accompanied him on the mission remained on the beach to guard the prisoners while Lieutenant Bollard flew to headquarters for help.

General Mark W. Clark, who had made several flights in Cubs during the Louisiana Maneuvers of 1941, used them extensively during World War II. He flew thousands of miles to pay official visits and to supervise training. Early in the war he secured an L-4 Cub which was piloted, according to General Clark, "by Captain Eugene P. Gillespie, a fine lad and an expert who could set the craft down almost anywhere, and usually did. I know one day when we sighted some soldiers playing baseball, the captain put our puddle jumper (L-4) down alongside the diamond and the GI's let me get my daily exercise by playing first base for a couple of innings."

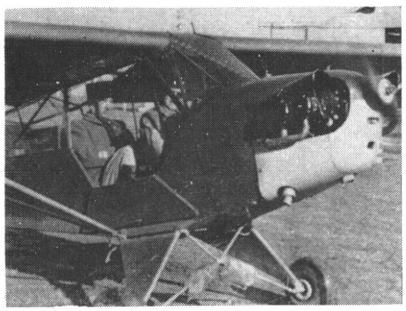
General Clark had his L-4 equipped with a loudspeaker, which was used primarily to shout instructions from the air to ground troops engaged in exercises. However, occasionally the speaker was used for less serious purposes. General Clark relates, "When we landed in Africa, each soldier was given a card on which were written words and phrases in French and Arabic for use in his contacts with the natives. I carried the card in my pocket, and one day when we flew low over a little Arab village I got it out and tried the phrases over the loudspeaker. The people rushed out of their houses and stared in amazement into the sky from which came the booming Arabic words that might well have been their idea of the voice of Allah.

"On another occasion, when I was returning to Oudjda, we flew over my headquarters and I shouted over the loudspeaker for a car to meet me at the airport. There was a fine flurry of activity around our offices, and by the time I got to the airfield there were three cars there to meet me. Three different officers within the range of the loudspeaker, which was considerable, had each decided the order was for him."

Army Aviation entered combat in North Africa without a firm plan of organization or

tactical employment. In fact, many Artillery commanders didn't even want to be bothered with the light planes or the Artillery pilots. Frequently, they failed to make provisions for feeding air section personnel and many a night an entire artillery unit would move and leave its air section somewhere back in the desert. Had it not been for the ingenuity of the liaison pilots, Army Aviation may well have died on these deserts.

The Artillery pilots encountered many unanticipated



A Free French officer in Algeria finds the L-4 useful in combat

problems in administration, supply, maintenance, and tactical employment. They did not have manuals and SOPs in which answers were spelled out. They solved their problems by improvising, and they learned their lessons from experience. By the time the North African campaign ended, a pattern for the employment of Army Aviation had been fairly well formed and commanders began to see the value of the light airplane in combat. The liaison pilots were ready for the next campaign.

REPORT FROM SICILY

The ingenuity of the people associated with Army Aviation was directly responsible for the success and growth of the program. Captain Brenton A. Devol, Jr., who had flown from the deck of the *Ranger,* demonstrated such ingenuity by constructing a flight deck on an LST (Landing Ship Tank) and making the first flights from it in experiments at Lake Bizerte and then in the invasion of Sicily. This was the first tactical use of an LST as an aircraft carrier in combat, but the idea proved feasible and the system was later used at Anzio and in Southern France. Captain Devol was awarded the Legion of Merit for his work.

The LST was converted in 36 hours. A runway 12 feet wide by 70 yards long was constructed of timbers and topped with metal landing strip mesh.

Four Cubs took off from the LST in the Sicilian landings. The runway on the LST was given a slight downhill tilt by placing ballast in the forward tanks. During the takeoff the pilot kept his brakes on and the tail high so he could see the white guide line painted on the ship. The Cubs attained flight speed in about three-fourths of the run while the ship maintained 9 knots into about a 10 mph wind. The LST carried 8 light planes—two on the flight deck, two on the main deck and four disassembled.

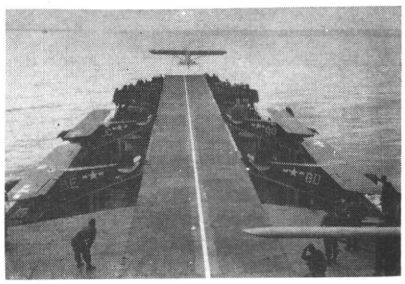
Since Sicily is extremely mountainous, new tactical flight techniques were demanded. Pilots had to fly higher and learn to cope with the turbulence of mountain air currents.

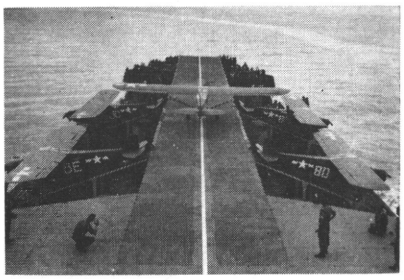
There were few flat areas, and many landing strips (such as the 1st Infantry Division strip near Torina) were located on a steep mountainside. Pilots had to learn to land using higher power in stall approaches and let the aircraft roll only a few feet. Takeoffs were usually accomplished by hand turning the tail around and rolling downhill with full power.

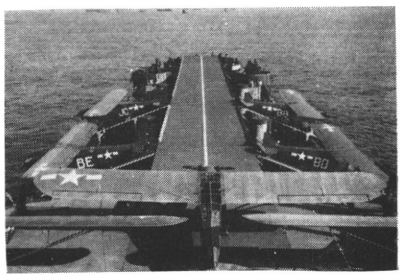
The Sicilian Campaign saw increased use of massed artillery fire directed on one target area from Air OPs. The enemy began to take note of the effectiveness of the Cubs and would silence all guns and personnel, both artillery and infantry when he wished to escape detection. Later in the campaign it was noted that the mere presence of the observation aircraft often silenced the enemy batteries.

The enemy did step up his attacks on the Cubs with rifle, machinegun, and antiaircraft fire, and with ME 109, FW 190, HE 111 and JU 87 aircraft. Enemy fighters usually attacked the Cubs in pairs. Many liaison pilots countered this by also going out in pairs, with one flying below as a lookout and giving radio warning. Proof that the

Cub flies off LST during Mediterranean invasion rehearsal







enemy was showing increased concern over the Cubs was reflected in a statement made by Maj Gen John P. Lucas that several intercepted German radio missions directed that "the next day the primary mission of their fighters would be against our Cubs."

The Cubs did an outstanding job as artillery spotters in Sicily and soon ground commanders found they could accomplish many other vital missions. In North Africa many commanders had ignored the pilots and their light planes, but in Sicily they began filing reports like these:

. . . Cubs were used extensively on Naval gunfire missions. One Cub was credited with nine Naval gunfire missions.

. . . Artillery observation aircraft were attacked on nine occasions by several enemy aircraft, but none were shot down; standard evasive tactics of rapid descent, contour flying and weaving have been successful. Ground fire and antiaircraft fire caused minor damage, but no aircraft were lost.

. . . When friendly bombers came over, our Air OPs would trail along behind them at a distance and as enemy ack-ack opened up they would adjust artillery fire on them.

. . . (from General Lucas) I have flown more in a Cub than in anything else. I flew back and forth across Sicily and when you go over the mountains you feel like you are perched on a pencil.

. . . Landing strips were few and uneven terrain caused serious turbulence. Liaison pilots learned to fly out to sea beyond the range of gunfire, parallel the coast, and look up the valleys to see what the enemy was doing.

. . . One observer flew on 20 different days between 11 October and 17 November (1943). Longest time in the air for an observer was 5 hours, during which time he flew four missions. Average mission takes 1¼ hours.

. . . One observation post engineer devised a parachute drop gadget, so observation planes could supply troops marooned on a mountain. Water cans weighing 90 pounds and 65-pound rations packets were dropped with parachutes made of O. D. blankets, which were also useful.

Hard work, long hours, ingenuity and effective employment in the Sicilian Campaign made ground commanders sit up and take notice of the liaison pilots and their light planes. The Italian Campaign loomed and Army Aviation was ready to play a major role in the liberation of Italy.

The Fifth Army's "Ski Jump" airstrip was built at Futa Pass, Italy, in 1944. Its steep grade loomed as a challenge to the liaison pilots

REPORT FROM ITALY

"We call them 'hell raisers,'" the captured German officer was saying, "after our unter offizier von Dienst — the duty officer who inspects our barracks every day and always raises hell when he sees something that displeases him." The German officer was speaking of the Artillery's light airplanes, which proved invaluable to ground commanders in the Italian Campaign.

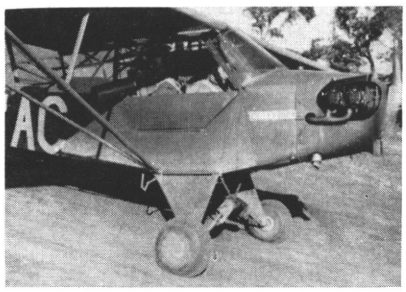
Again it must be stressed that Army Aviators often had to improvise to get the job done. But improvise they did, and toward the end of the Italian Campaign their potential and value was well known to both Allied and enemy troops alike.

An example of the field expediency demonstrated by the Artillery pilots is seen in the story of the Futa Pass "Ski-Jump." During the fall and winter of 1944 the Fifth Army was located north of the Arno River and in the mountains south of the Po Valley. General Mark W. Clark had moved up to the 15th Army Group and was succeeded as Fifth Army Commander by Gen Lucius K. Truscott. Due to treacherous mountain country it was difficult for General Truscott to visit units under his command. It was treacherous to travel by jeep in the mountainous country and too time consuming to be practical. The general would use a Cub whenever possible. In the Futa Pass area it was particularly difficult for General Truscott to get to the nearest air-

strip. It involved a 30-minute jeep ride down out of the mountains, and then he had no assurance that a river running through the valley wouldn't be too high to cross.

Consequently, General Truscott pressed Capt Jack Marinelli, the Fifth Army Air Officer (now Colonel, retired), to get an airstrip built near the CP, "and the closer the better."

After much reconnaissance and map studying Captain Marinelli and an Army Engineer decided the only place to put the strip was on a mountainside. Within a few days a good strip covered with coco matting and pierced steel planks was completed. The only trouble was that the strip was so situated that a pilot had to land uphill and take off downhill.



An L-4 mounted with a K-24 camera takes off from Anzio

It had the appearance of a ski jump—being 735 feet long, and 30 feet wide with a 20 percent grade. The upper end of the strip was 97 feet higher than the lower part, which ended abruptly with a shear 2,000-foot drop-off to the valley below.

"The interesting feature," according to Colonel Marinelli, "was that we had to use full throttle to taxi to the top of the strip after landing. But you could also take off down the strip without power."

General Truscott made good use of the Cubs in Italy and had confidence in them. During the Volturno offensive he had the entire Fifth Army massed for an attack. However, bad weather had grounded the regular photo reconnaissance planes and for several days the entire Fifth Army was held up for want of photo reconnaissance.

Finally General Truscott sent up a G-2 artillery spotting Cub. It flew straight up the valley, snapping pictures as it went, and on the basis of those pictures the assault began. Cubs were used extensively by G-2 in Italy and other theaters of war to obtain information when other aircraft were grounded because of weather.

General Clark continued to find new uses for the "puddle jumper" (as he referred to the light planes) in the Italian Campaign. On 4 October 1943 he found himself unable to reach Naples by jeep because of a traffic jam. Since he had an important conference scheduled, he jumped into his "puddle jumper" and told his pilot, Capt Eugene P. Gillespie, to fly him to Naples. Arriving over the city they found that the regular airport had not yet been cleared of mines. Consequently, Captain Gillespie astounded the Neopolitans by landing on the Boulevard Carragiola, which runs along the edge of the Bay of Naples in the heart of the city. It was necessary for General Clark to commandeer a jeep, but he made the conference and later he and Captain Gillespie took off from the street.

On the Anzio and Cassino fronts, General Clark flew back and forth to coordinate the fighting. On 25 January 1944 Maj John T. Walker flew him to Anzio where they observed that the unloading was proceeding well. General Clark relates that he also observed German resistance building rapidly against the bridgehead troops at Anzio, while on the other hand satisfactory progress was being made in the advance toward the town of Cisterna. General Clark consequently alerted the 180th Regimental Combat Team of the 45th Infantry Division and the Special Service Force for movement to the Anzio sector to help out.

It was during the time of the fighting in the Anzio-Cassino sector that General Clark experienced one of his most memorable flights. With Lieutenent Colonel Walker flying, the pair were proceeding on a flight from the mouth of the Volturno over their usual route about 20 miles at sea to Anzio. General Clark relates, "We usually flew only half-a-dozen feet above the waves in order to escape detection by enemy planes, and at Anzio, where the landing field was regularly under artillery attack, we often landed on the water. Walker had constructed pontoons for the Cub, and we would land close to the beach, jump out and use ropes to pull the craft up on the sand.

Gen Mark Clark (center), Lt Col J. T. Walker ready to depart in L-4; Lt M. J. Strok at left

"On our return journey this day, the waves were a bit high when we left Anzio, and after getting several soldiers to give us a push we bounced roughly out to sea. It was necessary for Walker to bounce the plane from wave to wave in order to get it airborne, and the water whammed against the pontoons with every bounce. We hit one wave with a terrific thud, but a moment later were in the air and on our way. A few minutes later, Jack said, 'You see what happened?'

"I looked over the side of the plane and saw that both pontoons had been broken off and were hanging to the craft by a single wire.

" 'I see,' I replied.

" 'What,' Jack asked, 'do you want to do now?'

" 'Hell, you're the pilot,' I said. 'Don't ask me.'

" 'The only reason,' he said, 'that I asked the question, sir, is that it is merely a matter of where the hell would you prefer to crash.'

" 'In that event, make it Sorrento. It's a pretty place.'

" 'Okay. It's Sorrento.'

"We flew for about two hours down the coast to the beach adjacent to the Albergo Vittoria, a hotel that had been made into a recreation and rest center for Fifth Army officers. There is a breakwater below the hotel, which stands on a high bluff with its spacious balconies facing the sea. The balconies were crowded with people, and as we circled unhappily over the beach they saw that the pontoons were broken and that we were in trouble. A crowd quickly collected at a point we indicated on the beach. Jack turned out to sea and then came in low over the water and as close to the beach as he could figure it. He put her down hard in about four feet of water and both of us got out as fast as possible. It was a good landing from my viewpoint, but as we waded to shore we could see that the plane was fit only for the salvage heap."

Night adjustment of artillery fire began being used more frequently below Cassino and at Anzio. Often aerial fire adjustment at Anzio amounted to guns of all calibers, with many volleys per battery. On one particular target over 370 guns were fired on TOT (time on target) adjusted by Capt John W. Oswalt, air officer of the 1st Armored Division. This included Naval gunfire from three cruisers offshore — the *USS Brooklyn,* the *HMS Dido* and the *HMS Orion.*

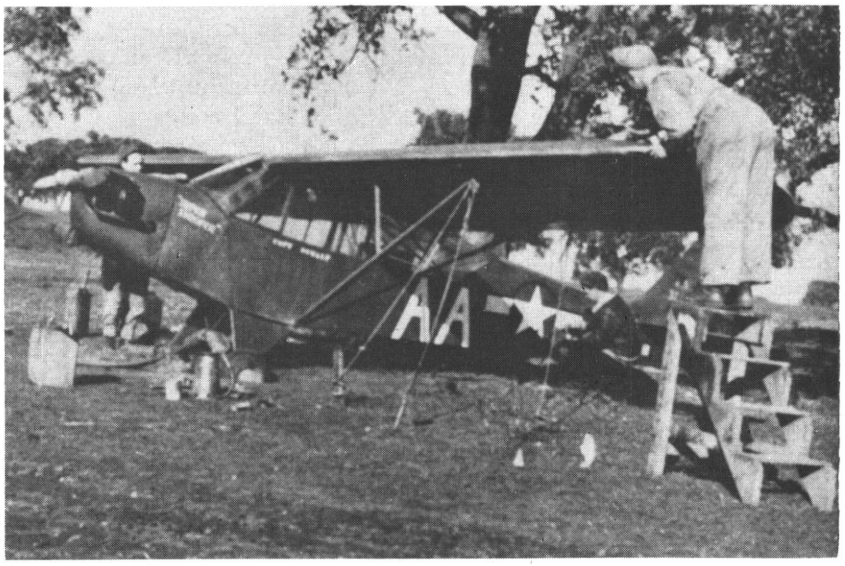
An L-4 lands on an Anzio airstrip 50 yards from the front

Lieutenant Frank A. Perkins flew as a pilot for an observer who directed fire on Littoria and Adria on the Anzio beachhead. The towns literally crumbled under combined fire from Allied artillery and British and American ships.

During the fighting at the Anzio beachhead Allied troops were taking heavy casualties. An urgent need for whole blood arose and Fifth Army arranged to send 50 pints of blood in two Cubs. Lieutenants Paynee O. Lysne and Richard W. Blake flew the blood in to the beachhead under extremely hazardous conditions. In less than 24 hours after the request had been made, the blood was being administered.

Brigadier General J. I. Martin, Army Surgeon, officially extended his "sincere appreciation to these liaison pilots for the splendid assistance they rendered. Their willing cooperation undoubtedly was instrumental in saving the lives of Fifth Army soldiers."

Another report from the Anzio beachhead stated that the



Mechanics check an L-4 under an olive tree on the Anzio beachhead

Air OP planes suffered frequent attack by German fighter planes. To retaliate the radar observers would immediately warn antiaircraft batteries and any airborne Cubs whenever enemy planes approached. The liaison pilot would immediately head for the nearest antiaircraft battery and with any luck the enemy planes would follow him in and be shot down.

In the assault on Rome, Capt John Oswalt landed his Cub on a racetrack on the outskirts of the city on 3 June 1944 to contact lead tanks and armored cars entering the city. Within a few minutes Capt Bill Holden and Capt Bill McKay landed at the racetrack. It was beginning to look like Army liaison pilots were holding a reunion in Rome even before the city fell.

On 4 June General Clark had traveled by jeep to a point 5 miles from Rome. There he learned that some elements of the Special Service Force were already on the western edge of Rome and that other flying spearheads were entering the city. All were receiving resistance.

General Clark had told his pilot, Major Walker, to fly along Route No. 6 and try to locate his party in event a landing could be made and the Cub could be used. Major Walker located the general's party in the outskirts of Rome. There was no place to land, so Major Walker picked a school yard. He brought the Cub down inside a courtyard formed by the school buildings and an 8-foot brick fence. "It was a good spot for protection from the occasional shells falling in the area," General Clark recalls, "but not what I would call an ideal landing field. It definitely was short on runway space."

After the landing, General Clark and Major Walker went to the foot of a hill leading up to the gates of the city. They could see a large sign labeled ROMA.

Later, after heavy firing had died down, General Clark was joined by Brig Gen Robert T. Frederick. They decided to go up and take a closer look at the sign, and as they crawled along a ditch they were joined by Maj Gen Geoffrey Keyes.

At the top things seemed safe, so the group stood up. "Some of the newspaper photographers had followed us," General Clark related, "and they asked us to move over beside the ROMA sign because it would make a good news picture. We did, and they quickly snapped the camera shutters, just as a German sniper cut loose at us. The first bullet went through the sign with a bang. I doubt that anybody ever saw so many generals duck so rapidly. We crawled back down the ditch to safer ground, but later Frederick had someone get the sign and eventually brought it to me as a souvenir. [This sign is now in General Clark's backyard at The Citadel.]

"Jack Walker and I waited around the school buildings for several hours until it became definite that I could not feasibly drive into Rome until the next day. With some hesitation, I got into the Cub plane while Jack figured out whether he had runway enough to clear the schoolyard fence. I was inclined to doubt it. He argued that he had enough room. As it turned out, he was right by a margin of three inches. We flew back to my command post."

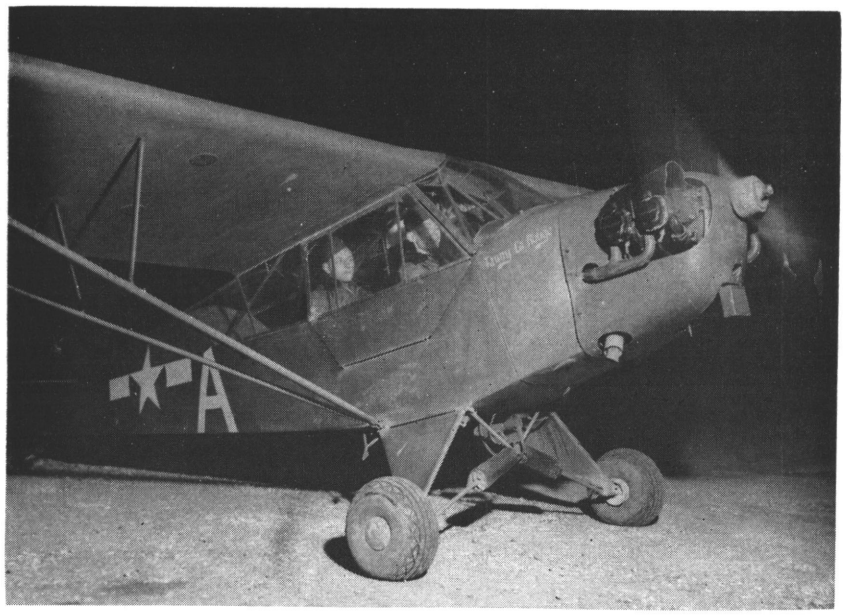
After Rome fell the L-4 liaison pilots continued surveillance of the retreating German army. Since the German Air Force was being pressed in France, Army Aviators were able to fly deep into enemy territory without too much danger. However, in the North Apennines the Germans established the Gothic Line and antiaircraft fire became intense enough to drive the Cubs to higher altitudes.

During the pursuit of the German Army to the Gothic Line, the first L-5s (heavier type liaison planes) were employed in increasing numbers by the Fifth Army. It was during this period that the "Horsefly" mission was developed.

Actually "Horsefly" grew out of a system known as "Rover Joe," which was developed by the XII Air Support Command. It amounted to having an air force officer go to the front to talk fighter planes onto targets. This system was widely used in the Fifth Army. On 29 June an experiment was made using 1st Armored Division L-5s to direct fighter plane attacks. The controllers were air officers who flew in four L-5s, each painted a different color for identification (Horsefly Yellow, Horsefly Blue, etc.). The experiment was not considered a complete success, but did prove the idea was practical.

Further work with "Horsefly" missions by IV and VI Corps was more successful. The VI Corps (in Southern France) used one Army L-5 and one Air Force L-5. The L-5s were piloted by Air Force fighter pilots from the supporting squadron and crewed by Army observers. Radio contact with the fighter planes was maintained.

Target information was radioed to the Army observers in the "Horsefly" planes. The Army observer and fighter pilot in the L-5 then located the target and directed the fighter planes on their runs—frequently dropping clusters of smoke grenades near



Lts M. J. Strok (right) and R. W. Blake leave on a night flight

the targets. This was essentially the same system the Fifth Army developed in Italy.

During the Italian Campaign extensive pioneer work was done in night direction of artillery fire from the Air OPs.

Captain Marinelli, the II Corps aviation officer, organized and conducted numerous night flights on the Cassino front with L-4s and L-5s. The L-5s were more desirable for night flying since they contained instrument panel lights (a flashlight was needed in the L-4).

During operations on the west coast near Gaeta, Captain Marinelli directed night operations from a small airstrip behind a ridge of mountains which offered protection from enemy gunfire. At night, the liaison pilots would fly well out to sea and then sneak in behind German lines and call in artillery. Naval gunfire also was directed during these operations. An Army liaison officer would take a 610 FM radio to the ship offshore. He would communicate with the Air OP pilot and relay target information to the Navy gunners. "You could see the ships when they would fire," Colonel Marinelli recalls. "It was a really impressive sight when they'd fire a salvo—the whole ocean would light up."

On one occasion ground fog moved in and hid the airstrip while Captain Marinelli was out on a night mission. "It was a bright moonlit night," Colonel Marinelli recalls, "and it was easy enough to find the airstrip because the mountains stuck up above the fog.

"We didn't have any homing devices, so when I got into the area I contacted S/Sgt Charles Biggsby and Sgt Charles Hair who were on the ground listening over the FM radio in our jeep.

"They'd listen for the motor and fire flares and tell me when I was right over the strip. I could barely make out the glow of the flares. They kept this up and talked me down until I broke out at about 300 feet and saw the jeep lights. Actually it wasn't as bad as it may sound," Colonel Marinelli adds, "I knew the altitude of the field and the heading of the strip, but on the other hand we didn't make a habit out of flying in the fog."

Captain O. G. Goodhand also conducted numerous night flying missions during the Italian Campaign. While assigned to the 35th Field Artillery Group he developed a feasible method of night adjustment of long range artillery fire that is either impossible or extremely hazardous in the daytime.

By the time Rome fell General Clark had more time in "puddle jumpers" than many liaison pilots did. He also had his share of unusual flights, such as one made during the pursuit to the Arno River: "When the Germans were driven beyond Civitavecchia, I had Jack Walker pilot me there on June 9 in a new L-5, which was a little larger and a little faster than the type of Piper Cub we had been using. I wanted to survey the port from the air to determine how much it had been damaged by the Germans before their withdrawal. It looked pretty bad as we came over the port, so I told Jack to start circling and just keep on circling until I told him to stop.

"As a result of this order, not only was I looking down at the water, but Jack was looking down, too, and neither of us saw an American barrage balloon that had just been run up as protection against a German air attack. There was a sudden grinding crash and the wing of our plane hit the barrage-balloon cable, which extended down to a truck at the edge of the harbor. The cable slid along the wing and caught on the airspeed in-

dicator [pitot tube]. . . .By the time I realized what had happened, gas was leaking from the wing tank and we were swinging wildly in a circle. My first thought was to bail out, but I remembered I had no parachute.

"Jack pulled the throttle wide open as we swung in a kind of spiral, and we went around the cable in merry-go-round fashion several times, spinning toward the water. Then, happily, the cable broke while Jack could still straighten out the plane into a glide. Gas was all over the place by then, so he shut off the engine and drifted toward land. Neither of us ever figured out just how we escaped that time, and the men handling the balloon later said that it had seemed impossible that Jack ever could pull the plane out of it. In addition there was a bomb attached to the balloon that was supposed to slide down the cable and explode when anything struck the cable. The only reason we could imagine that it had not was because we were going at very slow speed in a light airplane.

"Jack picked out a field not far from the water and set the plane down on it as tenderly as possible. When we crawled out, both of us were still shaking.

" 'Sir, you have just witnessed a miracle,' Jack said, and it wasn't exactly a joke. 'I really thought it was all over.' "

The addition of the L-5 brought many varied comments from the front. Many thought the L-5 was too heavy and should not be considered. Others felt the L-4 was underpowered and preferred the L-5.

Both aircraft had their good points. The L-4 was extremely maneuverable and able to get in and out of many more confined areas than the L-5. However, the L-5 carried more of a payload and had a few instruments.

At least one liaison pilot cast his vote for the L-4 because it was easy to fly and maneuverable. The unknown pilot wrote of his encounter with a German ME 109 fighter plane: "I was waiting on a TOT when I was startled by what seemed to be a lot of Roman candles shooting past my L-4. I rolled on my back and dove immediately. As I descended I noticed the German lowering his gear to slow down. About then ground fire opened up on the 109 and drove him off.

"It was then I noticed the dive had broken the airspeed indicator and the ribs on the wing were buckled. The L-4 was tops. If we had used any other aircraft with the experience level of our pilots we would have lost a lot more people."

However, the L-5 was superior to the L-4 in the performance of such missions as aerial wire laying. The L-4 could carry only one-half mile of wire at a time and was used infrequently for this purpose in combat. The only reported incident was when an L-4 laid wire to establish the first communications across the Volturno River. The L-5 was capable of laying up to 5 miles of wire on a single run. Wire laying missions increased in the European and the Pacific theaters of war after incorporation of the L-5.

As in Sicily, reports of the accomplishments of the Air OPs flowed in from commanders:

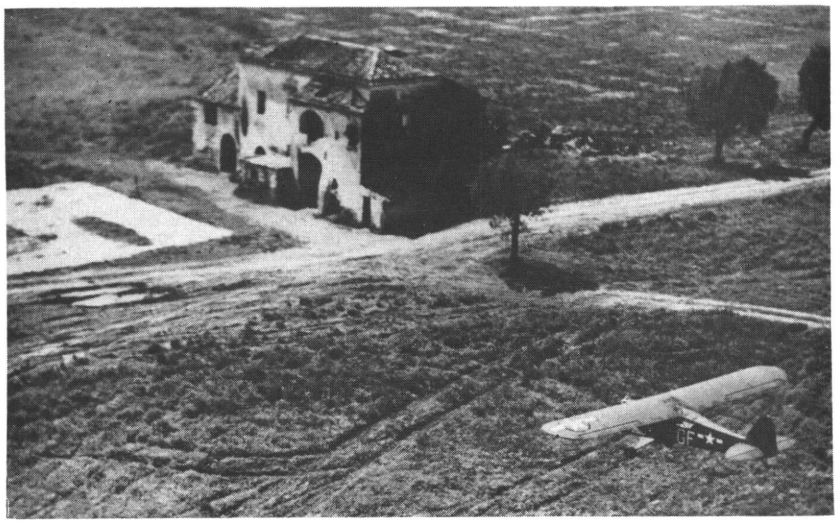
. . . Troops moving forward to the front had to pass through a bottleneck which the Germans had under observation and were shelling. Seven Cub planes were sent up and the German artillery fire stopped. The Cubs were kept up and the troops passed through without receiving any more fire.

. . . The Germans experienced great difficulty shooting down our Cubs, but one did the job by cutting off the Cub's wing with his own wing.

. . . In the last offensive (in Italy) Cub planes were used in at least one instance to drop pigeons by parachute to forward elements of infantry. The Cubs were of great value to our G-3 in reporting locations of various units when contact was lost with our own troops.

. . . The two most abundant sources of information of enemy locations and units came from PW interrogations and the ob-

An L-4 pilot on patrol looks over a house in Italy in 1944



Brig Gen. Thomas E. Lewis (left) chats with his pilot, Lt M. J. Strok

servations of the Cub pilots.

. . . One morning a Cub flying over the mountains spotted one of our mule pack trains proceeding to the front over a mountain trail. Two or three miles beyond, the Cub was fired on by rifles. Upon further investigation the pilot discovered a bypassed group of about 20 to 30 men with machineguns who appeared to have set up an ambush on the same trail our pack train was using. The pilot immediately flew back and dropped a warning message. Thus the ambush was averted.

. . . The Air OP boys tangle with 88s and ME 109s—risk their necks to take infantry officers on air reconnaissance and are feared by German artillery to such an extent that they quit giving us hell every time a division plane takes to the air.

. . . Once, only a few minutes after one of the observation planes appeared, . . . a moving German convoy was destroyed by American gunfire. On another occasion, a concentration of Nazi troops and material was broken up after one of the feared little planes slipped from behind a mountain and detected it.

. . . Nothing seems quite so incongruous as to see a puny, impudent little plane weaving its way through a valley where heavy guns are blasting the enemy. Their actions constantly amaze ground troops and the pilots of fighter planes and bombers.

. . . Combat pilots [American] in their 2,000-horsepower planes delight in chastising the saucy "Hell Raisers" by diving at the light plane. When caught in the speedy fighter's backwash, it invariably turned the light plane upside down. It's good clean fun and both pilots enjoy it. [? — Editor's note]

. . . Lt [Robert S.] Feinburg recently watched guns, men and material destroyed by artillery fire called in by an Air OP. He reported, "It may sound ridiculous, but those Germans actually left their foxholes and started climbing trees."

. . . Someone had to spot the German gun positions in the mountains and our air observation planes did just that.

. . . A Cub made a low pass over the patrol and out tumbled food, ammunition, and the paper. The Cub had delivered copies of a special 4-color holiday edition of the "45th Division News" to the troops' doorstep.

During the last few days of the war in Italy, German and Italian prisoners began streaming down out of the mountains to surrender. General Truscott got Captain Marinelli to fly him up and down the Po Valley to see the enemy troops coming in. They spotted a large number of German tanks, trucks and troops milling around the square of one small town.

General Truscott and Captain Marinelli decided to fly in low over the German troops in sort of a peace-making gesture. However, as they got right over the square, every German in town opened up on the L-5 in what seemed like a last minute attempt to shoot up all their ammunition before the war ended. Despite having their plane riddled with bullets, the pair managed to escape unharmed. They continued their flight, but at a more discreet altitude and at a considerable distance from the little town full of angry Germans.

After the war in Europe was over, General Truscott encountered Captain Marinelli and informed him, "I just wanted you to know that the last time I was shot at in the war was when I was riding in your airplane."

Army Aviation's stock was soaring by the end of the Italian Campaign and the advocates of organic aviation were jubilant. But their missions were not accomplished without tragic and painful moments. General Clark deeply felt the loss of his pilot and friend, Lt Col John T. Walker, who was killed in a crash on a flight to England. All Army Aviators who fought in World War II and Korea recall similar tragedies and the names of comrades who paid the great price for victory. Army Aviation has not forgotten them.

A Good Preflight Improves

the Margin of Safety

Captain R. Cook

NO ARMY AVIATOR can deny that the proper type of preflight can provide the margin of safety and the good, relaxed feeling that all aviators have when they know the aircraft is safe and completely airworthy.

Aviators have a responsibility to themselves, their units, and their passengers to conduct a thorough preflight before *every* flight. The pilot who thinks a preflight is a minor phase of his job had better reevaluate his thinking.

What leads to poor preflights? Unfortunately excellent maintenance can be a factor. How so? Simply because an aviator can have such confidence in the standards of maintenance in his unit that he becomes complacent and conducts abbreviated preflights or no preflight at all — except possibly a ceremonial gas draining. It's great to have confidence in the abilities of your unit's maintenance personnel, but a *good* mechanic or maintenance supervisor is pleased to see a pilot make a good preflight. It merely verifies the fine job he's done. (Of course, a word of praise now and then doesn't hurt!)

Let's examine a few types of preflight inspections.

THE WALK AROUND. Many aviators use this type at one time or another. Justification? "It's too hot, it's too cold, or I just don't feel like it today." Incomplete knowledge of the aircraft is another factor that causes walk around inspections. Rather than closely going over all writeups with the crewchief or section leader, he slouches through inspections day after day, even though his very life may one day depend on it. After all, it might be embarrassing to question a writeup or show his lack of knowledge if he is asked questions.

THE RUN AROUND. This inspection is usually the result of haste. An aviator arrives at 0755 for an 0800 takeoff. His passengers are waiting and the operations officer is "mildly disturbed." After apologizing hurriedly to everyone in sight, he fills out the flight plan and races to the aircraft. He makes a 2408-13 inspection and decides that except for a few red dashes and diagonals the ship is in condition for flight.

He loads passengers and taxies out for a runup. Apologetically, he calls the tower to send someone out to remove a pitot cover. What else might he have forgotten? You name it. After all he didn't check *anything* closely, just looked to see if everything was all there—wings, landing gear, etc.

THE BEEN AROUND. This type inspection can be made by pilots having anywhere from 2 months to 20 years in aviation and from 95 to 6,000 hours of flying time in the type aircraft. He can tell by the way the aircraft looks or, even better, the way it sounds during runup whether there is anything amiss. If it sounds good and doesn't fall apart taxiing out to the runway, it'll make the flight.

You can, no doubt, think of other types, some used by your contemporaries and the type you make.

Do you give yourself and your passengers that added margin of safety found in a good, sound preflight inspection? Or are you good at convincing yourself that things take care of themselves? Don't sell the preflight short. It is *your* responsibility and *yours* alone to make the final check of the aircraft before taking off. Because the aircraft was "satisfactory" for the last pilot on the previous flight gives you no cause for complacency on *your* preflight.

Judgment is constantly put to the test. When an aviator sees oil on the engine, a broken safety wire, or oil dripping from the tail rotor gear box he must make a decision—based on good judgment: have it checked out and fixed, or forget it and fly. This is the separation point between the pro and the amateur. Pros *never* take *unnecessary* risks.

Take this opportunity to objectively look at your preflights. Give yourself the time needed to make certain the aircraft assigned you is in condition to help you accomplish your mission. You and your aircraft are partners in a big way. Neither can significantly fail the other without a catastrophe lurking along the way.

Shape up your PREFLIGHT INSPECTION, and improve your MARGIN OF SAFETY!

Capt Cook is dual rated and instrument qualified. He was a student at the University of Southern California when this article was written.

Tri-Services to Help FAA in Study of Near Mid-air Collision Hazards

THE DOD, IN response to a request by the FAA Administrator, has committed the Military Service to participation in a nationwide effort to further reduce the near mid-air collision hazard. The program will emphasize increased use of instrument flight rules (IFR) by military crews performing point-to-point, combat readiness, and administrative flights in visual flight rules (VFR) weather conditions.

Implementation of the program will be effected in three phases, carefully planned to disrupt neither the ATC system nor the accomplishment of military aviation objectives.

- Phase I will be initiated possibly in December 1962 and will last approximately 30 days. No increased IFR requirements will be imposed during this period. The purpose of the phase will be to collect air traffic data from airfields to measure the effectiveness of the Air Traffic Control system under existing day-to-day operations. Installation commanders will be required to collect and report to DA the total number of cross-country VFR and IFR flight plans (DD Form 175) filed each week.

In the case of VFR flight plans, this information will provide some indication of the number of additional IFR flights the Air Traffic Control system must absorb into the flow of IFR traffic in Phase III of the program. In the case of IFR flight plans, DA will want to know the average air traffic control departure delay measure from the time the pilot calls tower for ATC clearance. This information will serve as a base measurement for the evaluation of the increased IFR phase of the program.

- Phase II will follow immediately after Phase I and will last approximately 15 days. No increased IFR requirement will be imposed during this period, but this phase will differ from Phase I to the extent that all air traffic flow restrictions (local agreements between Air Route Traffic Control Centers and installation operations officers) will be lifted. The collection and reporting of flight plan and delay data will be the same as Phase I. The lifting of traffic flow restrictions on IFR flights may increase the use of IFR and have the effect of increasing the workload at some ARTC centers to the extent that departure delays will be immediately increased at certain airfields.

- Phase III will follow immediately after Phase II and will be completed in approximately 70 days. Increased use of IFR by crews performing point-to-point, combat readiness (proficiency), and administrative flights under VFR weather conditions will be initiated by stages. All aircraft with tail numbers ending in 0, 1, and 2 will comprise the first increment of aircraft upon which the increased use of IFR will apply. This stage of Phase III will last for approximately 21 days. Thereafter, an additional tail number digit will be added each 7 days until all aircraft have been integrated into the program. The collection and reporting of flight plan and delay data will be the same as Phases I and II.

All fixed and rotary wing aircraft, instrumented for IFR flight and assigned to Army units on active duty, will participate in the program when flown by instrument qualified aviators. However, instrument flight plans for administrative and combat readiness (proficiency) flights which might otherwise be conducted under VFR conditions may be cancelled for the following reasons:

- Time will not permit accomplishment of the mission under IFR.
- Air Traffic Control departure delay in excess of 30 minutes.
- To avoid excessive delays en route and in the destination terminal area.
- To avoid hazardous weather conditions.

IFR flight plan will be submitted by the aviator to flight operations officer at least 30 minutes before the ETD recorded on the flight plan.

Air Traffic Control departure delay will be recognized as the elapsed time between the aviator's call to the tower for IFR clearance and receipt of the clearance by the aviator.

Departure delay due to ramp congestion, runway obstruction, etc., will be reported as airport delay.

It must be recognized that the two measurement phases and the third phase of staged increases in the proportion of military IFR flight operations must yield valid data that can be used on a continuing basis to evaluate the capabilities and limitations of the ATC system, while at the same time ensuring that the departure delays do not increase to the extent that the missions of the military departments are subject to an unacceptable degree of degradation.

NOTE: This is advance information. Detailed directive and implementation instructions regarding the program will be provided by official DA correspondence in November.

SURVIVAL

by Instinct

TWO LITTLE girls are alive and well today because they used a survival technique that would do any Army Aviator proud.

The girls, ages 6 and 8, stayed by a crashed airplane for three chilling nights and three hot days until they were spotted from the air by rescuers. Their parents had been killed instantly in the crash of their single-engine plane on a wooded mountain slope almost 8,000 feet above sea level.

During their ordeal the girls did not have food or water. They obtained clothing from their dead parents' suitcases to protect themselves during the cold nights.

There have been cases where military airmen did not fare as well. Following one Army crash in mountainous terrain, for example, the crew decided to abandon their wrecked aircraft. Shortly afterward rescuers found them dead from exposure only a short distance away. They simply allowed the circumstances of the crash to overwhelm them. After being suddenly thrust into a new environment, they were unable to maintain the proper mental balance, did not take constructive action, and lost the will to live. Yet they were well equipped with food, water, fuel, and other equipment for survival!

Not so with the two small girls. They played the waiting game. They watched search planes fly in the area for two days and never gave up hope of being found.

As they waited, the older sister said, "When the helicopters come they will find us because they can land anywhere."

A helicopter did come, one hired by the girls' grandfather, and both girls were soon on their way to a hospital for treatment.

Their grandfather attributed their lives to their decision to stick by the airplane until they were found. The doctor who treated them backed him up. "They just fought the problem themselves with Mommy and Daddy dead," he said.

The mental balance maintained by the two youngsters during their three-day nightmare was amazing. One of the girls said, "We took care of each other. She helped me and I helped her."

It must be pointed out that staying with a crashed aircraft may not necessarily be the correct solution. The decision to stay or leave will be affected by particular circumstances. A downed Army Aviator whose aircraft has been swallowed up by thickly foliaged jungle growth, for example, might do well to pack up a few necessities and move out. If he perchance spotted a river before going down, he stands a good chance of reaching civilization once again if he moves with care and caution.

Army Aviators who fly over vast stretches of desert, swamp, jungle, or mountainous terrain can be prepared for a crash emergency. When the emergency presents itself they should be mentally prepared to cope with it.